

Legal terrain—the political materiality of territory

Stuart Elden*

This lecture sketches the contours of a political -legal theory of terrain. It argues that terrain is a useful concept to think the materiality of territory. Terrain is where the geopolitical and the geophysical meet, and it is therefore a helpful concept to make political -legal understandings of territory better account for the complexities of the geophysical.

FROM PHYSICAL GEOGRAPHY TO MILITARY GEOGRAPHY

Terrain is an important concept in both physical and military geography. In physical geography, it usually refers to topography, the vertical and horizontal aspects of the surface of the earth. This notion is then used in military geography to analyse how troops, artillery and resources can move, defend and attack. However, in both traditions the term is often used in a relatively unproblematic way to describe the types and textures that define particular spaces—land forms rather than land processes.

Often in physical geography the term is not seen to require further elucidation, with more attention being paid to the mode of its analysis than to the

* Professor of Political Theory and Geography, University of Warwick; Monash Warwick Professor, Faculty of Arts, Monash University. Email: stuart.elden@warwick.ac.uk. This article was presented at the *London Review of International Law* Annual Lecture at SOAS University of London, 23 February 2017. It was also given as the Anniversary Lecture, International Research Centre for the Study of Culture, Justus-Liebig-Universität Gießen, 13 December 2016; as a public lecture at the Institute of Advanced Study, Durham University, 6 February 2017; as a keynote to the ‘Technologies of Space: Verticality, Volume, Infrastructure’ symposium, University of Oslo, 3 March 2017; and as a department seminar at the Department of Geography, National University of Ireland, Maynooth, 23 March 2017. Preliminary versions were presented in 2015 to audiences at the Association of American Geographers annual meeting in Chicago; at the Graduate Center, City University of New York; at the Monash-Warwick Borders workshop, Monash University; and to the Landscape Urbanism Programme, Architectural Association, London. I am grateful to the organisers for their invitations and to the audiences for their questions and suggestions. The paper has its genesis in conversations with, notably, Gastón Gordillo and Philip Steinberg. This work is part-supported by the ICE LAW project funded by The Leverhulme Trust.

complexities of the term itself.¹ An entire book by Colin Mitchell devoted to terrain evaluation moves very quickly from a discussion of terrain as a concept to the mode of its evaluation. His description there is revealing:

Terrestrial life depends on a surface mantle of rock and soil not more than a few metres deep and the associated plant cover. The character and behaviour of this mantle under the influence of climate determine its suitability for all types of land use. Terrain represents one of the triad of factors of production: land, labour and capital. It differs from the others in being relatively fixed in location and extent and in being more amenable to geographical forms of analysis. Accelerating population growth and earth-transforming technologies are changing the environment at an unprecedented rate, often for the worse. At the same time, modern methods of data processing make it possible to gather and manage information much more efficiently and rapidly than hitherto. There is an urgent need to harness this capacity in order to improve land use and management.

Terrain evaluation is an important technique in achieving this. It integrates other land resource factors, notably surface materials, soil, water, and vegetation on a common readily comprehensible basis, such that a map of terrain can be used as a framework for the others. For this reason, it forms the basis for the interdisciplinary approach known as ‘integrated survey’.²

This is interesting for a number of reasons. It stresses the interaction between the layer of terrain (above deeper rock) and climate, and relates this to the question of land use. But then it quickly equates terrain with land, seen as one of the three factors of production. The heritage of those three terms is long and complicated, but one classic place in which they are brought together is Karl Marx’s *Capital* Volume III. This text has a chapter devoted to what is called ‘The Trinity Formula’ of land, labour and capital. What Mitchell’s analysis

1 See, e.g., IS Evans, ‘What Do Terrain Statistics Really Mean?’, in SN Lane, KH Richards & JN Chandler (eds), *Landform Monitoring, Modelling and Analysis* (Wiley, 1998) 119; J Minár & IS Evans, ‘Elementary Forms for Land Surface Segmentation: The Theoretical Basis for Terrain Analysis and Geomorphological Mapping’ 95 *Geomorphology* (2008) 236. For a fully quantitative approach, see, e.g., RG Soule & RF Goldman, ‘Terrain Coefficients for Energy Cost Prediction’ 32 *Journal of Applied Physiology* (1972) 706. For the development of this work, see M de Gruchy, E Casell & J Edwards, ‘Velocity-Based Terrain Coefficients for Time-Based Models of Human Movement’ 45 *Internet Archaeology* (2017), available at <http://intarch.ac.uk/journal/issue45/4/index.html> (last visited 20 July 2017). I am grateful to Ian Evans and Michelle de Gruchy for suggestions on this more science-based approach to the concept.

2 CW Mitchell, *Terrain Evaluation: An Introductory Handbook to the History, Principles, and Methods of Practical Terrain Assessment*, 2nd ed. (Longman, 1991) 3.

proposes, though, goes beyond merely seeing land as an economic relation, of collapsing land to rent. Even Marx falls foul of this—in the fragments assembled by Engels for that third volume of *Capital*, he relates the three terms to their economic aspect: ‘Capital-profit . . . land-ground rent, labour-wages’.³ Land, for Mitchell, as terrain, is material. However, Mitchell sees the purpose of understanding this materiality as directly linked to improving ‘land use and management’, so the economic is only one step removed. But then immediately he moves to ‘terrain evaluation’ as the means, the mode of inquiry.

When we turn to his ‘definition of terms’, Mitchell says that the *New English Dictionary* definition is useful: terrain is a ‘tract of country considered with regard to its natural features and configuration’.⁴ He sees terrain as preferable to other terms which are either too general, such as ‘environment’ or ‘milieu’, or to those which would bring in too many other sciences, such as physiography, which would include geology, ‘climatology, meteorology, oceanography, and natural phenomena in general’.⁵ Mitchell also suggests that ‘terrain’, as he is using it, comes close to ‘landscape’ and ‘land’, but that the former ‘rather too strongly connotes the visual and artistic aspects’, and the latter is too broad for his purposes.⁶ He sees geomorphology as having ‘the advantage of being more narrowly confined to landforms but is too strongly involved with considerations of process’.⁷ This is telling. In much physical geography we find a clear distinction between form and process.⁸ Land processes work *on* terrain; but terrain itself is not seen as dynamic. Additionally, in distinguishing topography from bathymetry (the study of undersea depth and surface), this sense of terrain has also tended to reinforce a strict ‘land versus sea’ distinction—see Mitchell’s wish to exclude oceanography from his purview. He also wishes to exclude the atmosphere and the earth’s crust more than 6 m from the surface.⁹

Terrain, in the way I am beginning to theorise it here, actually overturns many of the restrictions that Mitchell puts upon it. Terrain can be land, water or

3 K Marx, *Capital: A Critique of Political Economy, Volume III*, trans. D Fernbach (Penguin, 1981) 955.

4 Mitchell (1991) 4.

5 Ibid.

6 Ibid.

7 Ibid.

8 RJ Huggett, *Fundamentals of Geomorphology*, 3rd ed. (Routledge, 2011) 21 and *passim*; SN Lane, JH Chandler & KS Richards, ‘Landform Monitoring, Modelling and Analysis: Land Form in Geomorphological Research’, in Lane et al. (1998) 1; C Lawrence, R Byard & P Beaven, *Terrain Evaluation Manual* (Transport Research Laboratory, 1993); JP Wilson & JC Gallant, *Terrain Analysis: Principles and Applications* (Wiley, 2000).

9 See Mitchell (1991) 6.

some blurring of the two in indeterminate and dynamic environments such as rivers, estuaries, marshes and swamps, glaciers, and sea ice. I am concerned with developing a political theory of terrain, which takes into account legal questions, alongside economic, strategic, technical and scientific ones.

Terrain, in this expanded sense makes possible, or constrains, various military-strategic projects. We can find examples of terrain analysis as far back as the earliest military-strategic texts. Julius Caesar's *Gallic War* is one example of how a military commander views a landscape, with space as a strategic and contested medium, rather than a passive backdrop or simply the stake of struggle.¹⁰ Several centuries later Niccolò Machiavelli suggests that political rulers should make the effort to study terrain in order both to defend their own and be better placed to conquer that of others. He says that hunting is a good process for 'becoming familiar with the terrain [*la natura de' siti*]: how mountains rise, how valleys and plains spread, the characteristics of rivers and swamps'.¹¹

Military geography has frequently looked at the physical constraints to military action, and a number of studies of military campaigns have analysed these factors.¹² There is, however, little conceptual discussion in much of this work. Doyle and Bennett suggest that terrain 'encompasses both the physical aspects of earth's surface, as well as the human interaction with them'.¹³ While they stress the human-terrain interaction, at times terrain seems to be landscape devoid of life. This sense can be found, at its extreme, when the targeting of cities is discussed without reference to those living within them,¹⁴ or when terrain is reduced from a concrete materiality to a level of virtuality.¹⁵ Recent events, from Fallujah to Aleppo, from Raqqa to Mosul, through to drone strikes, illustrate the targeting of spaces in this way.

10 J Caesar, *The Gallic Wars*, ed. and trans. HJ Edwards (Heinemann, 1917). See also S Elden, *The Birth of Territory* (University of Chicago Press, 2013) 56-57.

11 N Machiavelli, *The Prince*, trans. and eds Q Skinner & R Price (Cambridge UP, 1988) 52-53, s 14. I have slightly modified the translation, after N Machiavelli, *Opere*, eds S Bertelli & F Gaeta, vol. 1 (Feltrinelli, 1960): see Elden (2013) 251.

12 See, e.g., JT Parry, 'Terrain Evaluation, Military Purposes' in CW Finkl (ed.), *The Encyclopedia of Applied Geology* (Van Nostrand Reinhold, 1984) 570; HA Winters, G Galloway Jr., WJ Reynolds & DW Rhyne, *Battling the Elements: Weather and Terrain in the Conduct of War* (Johns Hopkins UP, 1998); EPF Rose & CP Nathanail (eds), *Geology and Warfare: Examples of the Influence of Terrain and Geologists on Military Operations* (Geological Society, 2000); J Carman & P Carman, *Bloody Meadows: Investigating Landscapes of Battle* (History Press, 2006).

13 P Doyle & MR Bennett, 'Terrain in Military History: An Introduction', in P Doyle & MR Bennett (eds), *Fields of Battle: Terrain in Military History* (Kluwer, 2002) 1, 1.

14 S Graham, *Cities under Siege: The New Military Urbanism* (Verso, 2010).

15 D Gregory, 'The Rush to the Intimate: Counterinsurgency and the Cultural Turn' 150 *Radical Philosophy* (2008) 8; T Paglen, *Blank Spots on the Map: Dark Geography of the Pentagon's Secret World* (Penguin, 2009).

More recently the US Army has run a programme called Human Terrain System (HTS), which used social scientists to help the army understand the local population of areas in which they were operating. As the *Human Terrain Team Handbook* argues:

A fundamental condition of irregular warfare and counter-insurgency operations is that the Commander and staff can no longer limit their focus to the traditional Mission, Enemy, Terrain and weather, friendly Troops and support available, and Time. The local population in the area of conflict must be considered as a distinct and critical aspect of the Commander's assessment of the situation.¹⁶

'Human terrain' was therefore defined as 'the human population in the operational environment (area of operations) as defined and characterized by sociocultural, anthropologic and ethnographic data and other non-geophysical information about that human population and society'.¹⁷

What is interesting here is that the geophysical (terrain) and the population (human terrain) are clearly distinguished, in such a way that the programme fully focuses on the latter, assuming that the former is addressed by a more traditional military strategy. The programme ran from 2007 to 2014, and was strongly opposed by academic groups, notably the American Anthropological Association.¹⁸ Given its focus is exclusively on the non-traditional sense of terrain, I will not add to such discussion, though it is intriguing that it adopts the word.

POLITICS, LAW AND TERRAIN

The geo-strategic elements of terrain are therefore fairly well examined, but the concept has yet to receive sustained attention within political geography.¹⁹ Neither has it been a focus in academic work in political theory

16 N Finney, *Human Terrain Team Handbook* (Human Terrain System, 2008) 2.

17 J Kipp, L Grau, K Prinslow & D Smith, 'The Human Terrain System: A CORDS for the 21st Century' 86 *Military Review* (September–October 2006) 8, 15, note 2. See also M McFate and A Jackson, 'An Organisational Solution for DoD's Cultural Knowledge Needs' 85 *Military Review* (July–August 2005) 18.

18 Gregory (2008); M Zehfuss, 'Culturally Sensitive War? The Human Terrain System and the Seduction of Ethics' 43 *Security Dialogue* (2012) 175.

19 But see, e.g., R Squire, 'Immersive Terrain: The US Navy, Sealab and Cold War Undersea Geopolitics' 48 *Area* (2016) 332. This paper was first presented in the 'Terrain' sessions that Gastón Gordillo and I organised at the 2015 Association of American Geographers meeting. I discuss Gordillo's work on terrain in more detail below. One of the relatively few books to take terrain, rather than terrain analysis or evaluation, as its topic is actually a collection of photographs: J Nickerson, *Terrain* (TF Editores, 2013).

or international relations, nor indeed in public international law. This neglect is surprising, because terrain is crucial to understanding the political practice of territory. Terrain is the very land and sea divided into different political-legal regimes, and indeed those regimes divide not just states from each other, but also consecrate the geophysical and geopolitical divide between land and sea. Yet, with partial exceptions, territory has often been seen in fully abstract terms, separating the political-legal control of areas from their physical and material state, and where it accounts for terrain this is detached from the processes which shape and transform it.

These shortcomings are highlighted in perhaps two of the most interesting recent political theoretical accounts of territory and the border—Margaret Moore’s *A Political Theory of Territory* and Thomas Nail’s *A Theory of the Border*.²⁰ Nail does not say much at all about the physical landscape divided into territories by borders. He briefly mentions the dynamic nature of geophysical features: ‘the movement of rivers, the shifting sands and tides along coastlines, the emergence and destruction of ocean islands, volcanic transformations of mountain ranges and valleys, the redistribution of the soil itself through erosion and deposition caused by wind and water, and even the vegetative shifting of tree lines, desertification and climate changes’.²¹ That, aside from some uncritical remarks on the idea of ‘natural borders’, is all there is in the major, theoretical part of his book.²² When he comes to the final part, which is a detailed discussion of the US–Mexico border in all its political, historical and geographical richness and complexity, he does make some more comments.²³ It would be almost impossible to talk about this border without them. It is remarkable that his theoretical work is almost completely devoid of attention to the geophysical. His theoretical work is certainly material, but it is almost exclusively on what is built.

Moore’s work is rather different, in that while it does discuss the geophysical a little,²⁴ it does not live up to its title, at least in the way I would understand it. Instead of being truly a political theory *of* territory, which would entail much more discussion of what territory is, or what it has been taken to be, it is rather

20 M Moore, *A Political Theory of Territory* (Oxford UP, 2017); T Nail, *A Theory of the Border* (Oxford UP, 2016).

21 Nail (2016) 6.

22 Ibid 149.

23 Ibid 168, 169–70, 175–76. For further studies of the US–Mexico border, see ES Casey & M Watkins, *Up Against the Wall: Re-Imagining the US–Mexico Border* (University of Texas Press, 2014); M Dear, *Why Walls Won’t Work* (Oxford UP, 2013). More generally, see W Brown, *Walled States, Waning Sovereignty* (Zone Books, 2010).

24 Moore (2017) ch. 8 on natural resources, especially 167–85.

an application of political theory *to* territory. If we know what territory is, and here it is described as essentially ‘land over which some agent has political authority, meaning authority to make and enforce laws governing the conduct of inhabitants on the land, including laws defining and delimiting property rights’,²⁵ then we can apply debates in (legal and) political theory—justice, property, rights, obligations etc—to it. Moore says that she began the book by lamenting ‘the lack of a theory of territory’. Her approach to dealing with this was ‘to address this lacuna, by advancing a theory that justifies rights over territory, both against those who think territorial rights cannot be justified and those who think they can, but who offer a different theory’.²⁶ She therefore defends the idea of territory and territorial rights in terms of self-determination and argues:

that this provides an intuitively plausible explanation of the relationship between territory, the state, and people, and that it justifies (within limits) those elements that we normally associate with territorial rights: rights of jurisdiction, rights over resources, rights to control borders, and so on.²⁷

The book essentially offers a ‘normative theory’ of territorial *rights*.²⁸

As sophisticated as its use of those debates around rights is, Moore’s work pays little regard to complexities around its putative object of analysis.²⁹ Indeed she references almost none of the literature on territory from outside her own discipline. There are no references to John Agnew, Robert Sack, David Storey, David Delaney, Susanne Lalonde, William Connolly, and others who, I would suggest, offer much to a theory of territory.³⁰ Instead her interlocutors are

25 Ibid 34, and see also 15–16. On property in land and political–legal regimes, see PD Burdon, *Earth Jurisprudence: Private Property and the Environment* (Routledge, 2015); D Rogers, *The Geopolitics of Real Estate: Reconfiguring Property, Capital and Rights* (Rowman and Littlefield International, 2017).

26 Moore (2017) 242.

27 Ibid.

28 Ibid 167, 242ff.

29 I have made the same criticism of A Kolers, *Land, Conflict and Justice: A Political Theory of Territory* (Cambridge UP, 2009): see S Elden, ‘Thinking Territory Politically’ 29 *Political Geography* (2010) 238.

30 J Agnew, ‘The Territorial Trap: The Geographical Assumptions of International Relations Theory’ 1 *Review of International Political Economy* (1994) 53; R Sack, *Human Territoriality: Its Theory and History* (Cambridge UP, 1986); D Storey, *Territories: The Claiming of Space* (Routledge, 2011); D Delaney, *Territory: A Short Introduction* (Wiley-Blackwell, 2005); S Lalonde, *Determining Boundaries in a Conflicted World: The Role of Uti Possidetis* (McGill-Queen’s UP, 2003); W Connolly, *The Ethos of Pluralization* (University of Minnesota Press, 1995).

Avery Kolers, Allen Buchanan, Cara Nine and David Miller.³¹ Moore says that Miller has argued ‘to almost universal acceptance’, that when we think of territory, we think of it ‘as involving a triangular relationship between three key elements: (1) a piece of land, (2) a group of people residing on the land, and (3) a set of political institutions that govern the people within the geographical domain (the territory)’.³² Such a definition is only acceptable, much less universally, if it ignores all the complexities inherent in the notion of land; and it sidelines the strategic, technical and geographical issues in favour of the privileging of the people, the institutions and the political. Territory for Moore is simply taken to be ‘land understood as a political and jurisdictional concept’.³³

This lecture is part of a wider project which seeks to develop an understanding of territory not bound by those limitations. It is worth underlining that I do not fully exclude my own previous work from criticisms of a lack of attention to materiality. In previous work I have argued that territory should be understood not as a simple bounded area, but in multiple registers.³⁴ Territory is political and geographical certainly, but these are bundled together with economic, strategic, legal and technical notions. The complicated and nuanced understanding of the legal, and its attendant techniques of rules and regulations; and more obvious technical *techniques* such as planning, surveying, mapping, engineering, logistics, operations, regulating and so on, are one of the reasons why I suggested we could think of territory as a political technology, or a bundle of political technologies. Technologies embrace not just the technical, but a wider framework of activities, legal regimes, practices and so on.³⁵

Territory is a process not an outcome, and it is a stake in political struggles rather than just their container. In seeing territory as a political technology, my

31 Her only reference to my work is to *Terror and Territory*, which she dismisses as focused on the etymology of the terms, rejecting that for her own approach: Moore (2017) 15, 30, note 1. Actually my book explicitly rejects the etymology; instead insisting on the relation at the level of practice. See S Elden, *Terror and Territory: The Spatial Extent of Sovereignty* (University of Minnesota Press, 2009) xxx: ‘Interesting as these debates certainly are, we do not need to rely on this suspect etymological basis. More importantly, we can see the relation in practice, too’.

32 Moore (2017) 8; D Miller, ‘Territorial Rights: Concept and Justification’ 60 *Political Studies* (2012) 252.

33 Moore (2017) 9.

34 S Elden, ‘Land, Terrain, Territory’ 34 *Progress in Human Geography* (2010) 799.

35 Gregory has proposed a ‘(bio)political technology’, stressing the bodies-in-space which, he suggests, I have rather neglected: D Gregory, ‘The Territory of the Screen’ 6 *MediaTropes* (2016) 126, 131. While I accept the criticism of my neglect, I think that if any development of the term ‘political technology’ is necessary, it should be ‘(bio-geo)political technology’, the bio- and the geo- being the parallel aspects of the political in this sense. Indeed, Foucault uses political technology to discuss population; my point is that it can encompass the territory as well.

intention was to look at the entangled and multi-faceted relations in the production, transformation and contestation of territory. This work led to a contemporary, political book—*Terror and Territory: The Spatial Extent of Sovereignty*—and a historical, conceptual one—*The Birth of Territory*.³⁶ In this work I suggested that while land and terrain were crucial to an understanding of territory, if those were understood narrowly in terms of the political–economic and political–strategic dimensions of space they were, alone, insufficient. In those earlier works, therefore, I privileged the political–legal and political–technical registers as important supplements to the traditional, narrow understandings of territory. As intentionally expansive as this work was, there are still other elements which need to be explored.³⁷ The next stage is to interrogate the relation between the geophysical and the geopolitical.

This work relates to some brief but intriguing remarks made by Bob Jessop in *The State: Past, Present, Future*, where he suggests that territory ‘should not be confused with the more generic notion of *terra*—“the terrestrial” (which encompasses “land” in its broadest sense, i.e., land and the subterranean, the sea, its depths and seabed, the air above, and outer space)—which provides a variable, technologically conditioned, and relational “raw material” of territorialization as a specific political process’.³⁸ Jessop is correct that territory is not the same as *terra* or the terrestrial, and he has an expanded sense of the latter, but in much work the *terra* is not taken into account at all. As he develops later in the same work:

Let me just recall the distinction between the terrestrial and the territorial. Whereas the former denotes the initial geophysical raw material or substratum for sociospatial relations (and becomes ‘second nature’ through its sociospatial transformation), territorialization is one form of the sociospatial appropriation and transformation of the terrestrial. Thus, while all social relations occur in terrestrial space (until the rise of telematic or cyberspace), not all social relations occur in territories constituted and controlled by a state apparatus.³⁹

In Jessop’s terms what I am concerned with here is neither the terrestrial nor the territorial alone, but the interrelation of the two.

36 Elden (2009); Elden (2013).

37 As some have pointed out, the affective, social and sacred could also be added. On the last, see N Howe, *Landscapes of the Secular: Law, Religion, and American Sacred Space* (University of Chicago Press, 2016).

38 B Jessop, *The State: Past, Present, Future* (Polity, 2016) 29–31.

39 *Ibid* 135.

THE MATERIALITY OF TERRITORY

The materiality of territory is usually understood in terms of the built landscape of walls, fences, ditches, tunnels, roads, road-blocks and cleared vistas that states construct and transform. While most of those maybe at the borders of states,⁴⁰ the built landscape of territory extends throughout the entire fabric of the state. This is the continual making and remaking of territory; what others, following Deleuze and Guattari have called, de- and re-territorialisation. But we can also think of these as state–spatial strategies; and more specific state–territorial strategies; and resistances to them. This brings in important issues of embodiment and corporeality; of bodies in places and places embodied.

But the materiality of territory would also be the (geo)physical landscape. We can think of borders which use landmarks such as mountain crests, rivers, coastlines, deserts. While the idea of these being ‘natural borders’ has long been discredited, that should not be taken to reduce the importance of the use of physical features of the landscape in marking political divisions.⁴¹ The US–Mexico border combines the use of built features such as the wall and fences, roadblocks, checkpoints and surveillance equipment, with an effective use of the terrain of the desert as a barrier. At certain points the wall itself ends, with objects designed to prevent vehicular access. Without a vehicle people would not get very far: the desert and rocky terrain becomes part of the border, itself a weapon against migration, in a similar way to how Frontex has effectively turned the Mediterranean into Europe’s southern border.

The aim of interrogating terrain is to make work on territory account more fully for this materiality. All attempts at fixing boundaries and shaping territories are complicated by dynamic features of the Earth, including rivers, oceans, polar regions, glaciers, airspace and the sub-surface—both the sub-soil and the sub-marine. As has long been known, rivers are dynamic features of the landscape, not static ones. They do not necessarily run where we want them to, or stay where they were. It is not possible to fix a geopolitical order without due attention to the complexity of the geophysical.

This has long been recognised. Some political theory, such as the physio-crats’ emphasis on soil, or Montesquieu’s interest in climate and geography, shows an attention to such matters.⁴² In public international law there are some

40 See S Mezzadra & B Neilson, *Border as Method, or, the Multiplication of Labor* (Duke UP, 2013); R van Reekum & W Schinkel, ‘Drawing Lines, Enacting Migration: Visual Prostheses of Bordering Europe’ 29 *Public Culture* (2017) 27.

41 For an interesting contemporary discussion, see J Branch, ‘How Should States Be Shaped? Contiguity, Compactness, and Territorial Rights’ 8 *International Theory* (2016) 1.

42 Montesquieu, *The Spirit of the Laws*, eds & trans. AM Cohler, BC Miller & HS Stone (Cambridge UP, 1989) pt II, bks 14–18.

important moments when geophysical features do explicitly matter in relation to jurisdictional relations. Examples would include the vertical differentiation of sovereign airspace and non-sovereign outer space. Another would be how, in the law of the sea, jurisdictional issues concerning the delimitation of the continental shelf and the deep seabed are shaped by geophysical knowledge. A third concerns the question of river boundaries.

In the Byzantine emperor Justinian's *Corpus Juris Civilis Romani*, three key questions are asked of rivers: What happens if a river changes direction, and land on one side ends up on the other? What happens if an island emerges in the middle of a river? Who owns the rights to a dried-up river-bed?⁴³ At that time these questions largely concerned property over land, and the relation between farmers, but today similar questions occupy states whose international boundaries were formed by rivers or whose boundaries cut across them. As dynamic earth features, rivers frequently shift position in the landscape. Sometimes the political–legal regime is able to account for this. The case of the ‘thalweg’ is well known. A thalweg is the deepest point in a river channel. If the river boundary follows this geophysical line, then if the river direction changes, so too does the boundary.⁴⁴ There are other instances, however, where the geophysical and the geopolitical no longer coincide. What happens when the geophysical feature, the river, being a dynamic earth feature, shifts from its previous course, and the geophysical and the geopolitical no longer coincide?

At the end of November 2016 there was a good example of this. Belgium and Holland have recently agreed to even up the border between their two countries in one small sector. Instead of the river Maase being the boundary between the two countries, as fixed in the 1839 Treaty of London,⁴⁵ its current course means that the river course and the boundary diverge. This is not, though, the result of a physical process—it was caused by dredging works in the 1960s and 1970s to make the connection between two canals more straightforward. Belgium will give two small uninhabited peninsulas to Holland (Presqu'île de L'Ilal and Presqu'île d'Eijsden, ~16 ha), and Holland one smaller one to Belgium (Presqu'île Petit-Gravier, ~3 ha). This will make the geopolitical and the geophysical more neatly coincide. There are some

43 *Justinian's Institutes*, trans. P Birks & G McLeod (Duckworth, 1987) vol. II.1, 20-24; *The Digest of Justinian*, eds T Mommsen & P Krueger, trans. A Watson, 4 vols (University of Pennsylvania Press, 1985) vol. 4, XLI.1.7. See the discussion in Elden (2013) 227-29; and N Blomley, 'Simplification is Complicated: Property, Nature, and the Rivers of Law' 40 *Environment and Planning A* (2008) 1825.

44 An example may be found in the ICJ decision: *Case Concerning Kasikili/Sedudu Island (Botswana v Namibia)*.

45 Treaty between Belgium and the Netherlands relative to the Separation of Their Respective Territories, signed 19 April 1839, 88 ConTS 427.

legal procedures to follow, but it looks like it will be resolved in early 2018. The more famous Belgium–Holland border anomaly, in the municipality of Baarle-Hertog, remains as it was. While there has been a precedent of the exchange of similar pockets of lands in India–Bangladesh, Belgium and Holland have kept the enclaves and exclaves.⁴⁶ This may be, in part, because it is now possibly the world’s most complex border, and a major tourist attraction for its geopolitical anomaly.⁴⁷

Another recent example is the story of how Norway is considering moving its boundary with Finland by a mere 40 m in order to remedy a slight geophysical anomaly. As a news story in *The Guardian* puts it:

At 1,324 metres above sea level, the highest point in Finland currently lies on a bleak mountain spur known as Hålditšohkka, part of a far larger fell known as Halti, more than 200 miles inside the Arctic Circle.

Halti’s summit, at 1,365 metres high, is a kilometre away in Norway. But moving the border barely 40 metres further up the mountainside would put Hålditšohkka’s 1,331-metre summit in Finland—and make the country’s highest point seven metres higher.

‘Geophysically speaking, Mount Halti has two peaks, one Finnish and one Norwegian,’ NRK explained to bemused viewers earlier this year. ‘What is proposed is that Norway gives the Finnish peak to Finland, because it is currently in Norway.’⁴⁸

The anomaly comes from the overlaying of a geometrical line over a geophysical terrain. The shift was first proposed by a retired geophysicist and government surveyor, Bjørn Geirr Harsson, who has described the existing border as ‘geophysically illogical’. However, attempts at this exchange have raised issues of the territorial integrity of Norway, with Article 1 of its constitution stating that the country is a ‘free, independent, indivisible and

46 ‘The Netherlands is About to Become 10 Hectares Bigger’, *DutchNews.nl*, 28 November 2016, available at <http://www.dutchnews.nl/news/archives/2016/11/the-netherlands-is-about-to-become-10-hectares-bigger/> (last visited 7 July 2017); A Taylor, ‘Tiny Belgium to Get Tinier as Netherlands Grows after Land Swap’, *Sydney Morning Herald*, 30 November 2016, available at <http://www.smh.com.au/world/tiny-belgium-to-get-tinier-as-netherlands-grows-after-land-swap-20161130-gt0kfy.html> (last visited 7 July 2017).

47 A van der Meer, Senior Project Manager, Dutch Cadaster, email correspondence, 2 December 2016, to INT-Boundaries list. See BR Whyte, ‘“En territoire belge et à quarante centimètres de la frontière”: An Historical and Documentary Study of the Belgian and Dutch Enclaves of Baarle-Hertog and Baarle-Nassau’, School of Anthropology, Geography and Environmental Studies, University of Melbourne, Research Paper No 19 (2004).

48 J Henley, ‘Norway Considers Giving Mountain to Finland as 100th Birthday Present’, *The Guardian*, 28 July 2016, available at <https://www.theguardian.com/world/2016/jul/28/norway-finland-move-mountain-halti-halditsohokka-highest-peak> (last visited 7 July 2017).

inalienable realm'.⁴⁹ For some, this would prevent even such a symbolic gift. Yet minor boundary changes happen frequently:

Øyvind Ravna, a law professor at the Norwegian Arctic university, told the [*Aftposten*] paper the constitution did not apply to minor border adjustments, pointing out that Norway's borders with both Finland and Russia had moved in recent times to reflect changes in riverbeds and the shifting position of sandbanks and islets.⁵⁰

As well as the interest of the specific example, this is a further instance of the general dynamic nature of river boundaries. It is worth stressing that the indigenous Saami people do not recognise either state's claim to this land. They see the existence of the border *itself*, rather than its location, as the problem.

States are therefore conditioned by material elements of their landscapes, even as they seek to transcend and transform them. As Neil Brenner and I have argued in previous work:

Territory enables, facilitates and results from the evolution of state action; and concomitantly, state action produces, facilitates and results from the evolution of territory . . .

Territory is always being produced and reproduced by the actions of the state and through political struggles over the latter; yet at the same time, in the modern world, territory also conditions state operations and ongoing efforts to contest them. States make their own territories, not under circumstances they have chosen, but under the given and inherited circumstances with which they are confronted.⁵¹

This is a notion that has been wonderfully described as 'the territorial palimpsest' by Thomas Sigler in his work on the Panama Canal.⁵² The term 'palimpsest', which originally meant a manuscript scratched out and written again, is also used in geomorphology and archaeology to describe landscape in terms of 'a series of complex and overlying layers', but in which there is a crucial difference from a textual palimpsest, in that 'these layers also interact'.⁵³ Sarah

49 Constitution of Norway (1814, amended 2016), available at <https://www.stortinget.no/globalassets/pdf/english/constitutionenglish.pdf> (last visited 20 July 2017).

50 Henley (2016).

51 N Brenner & S Elden, 'Henri Lefebvre on State, Space, Territory' 3 *International Political Sociology* (2009) 353, 364, 367. See also H Lefebvre, *De l'État*, 4 vols (Union Générale d'éditions, 1976-78); H Lefebvre, *State, Space, World: Selected Essays* ed. N Brenner & S Elden (University of Minnesota Press, 2009).

52 T Sigler, 'Panama as Palimpsest: The Reformulation of the Transit Corridor in a Global Economy' 38 *International Journal of Urban and Regional Research* (2014) 886.

53 A Goudie & H Viles, *Landscapes and Geomorphology: A Very Short Introduction* (Oxford UP, 2010) 2.

Dillon has provided a much more general discussion of the history and contemporary uses of the term palimpsest, from literary texts to literary theory.⁵⁴ What I think Sigler and others do is provide the potential for using it to make sense of the materiality of territory.

Panama itself is intriguing. As Brian Davis, Rob Holmes and Brett Milligan note:

Over the past five hundred years, the Panamanian isthmus has been transformed by a succession of megaprojects: the first colonial European city on the Pacific Coast; the mule trains that moved the plundered silver of Bolivia and Peru to Atlantic ports; the first railroad to cross the continental divide; the failed project to construct a sea-level canal connecting the two oceans; and then the immense complex of locks, dams, artificial lakes, and engineered channels that constitute the Panama Canal, which opened in 1914.⁵⁵

The Panama Canal is certainly a perfect example of the shaping and remaking of territory by states and capital. Yet the canal is being further developed to double the capacity of ships which can use it, a project which involves massive chambers with 50-ft thick walls built into the bedrock, and major demands for water to allow ships to pass through locks, which involves the creation of further reservoirs.⁵⁶

As these examples indicate, there are multiple ways in which states transform their territories: damming rivers for power and water storage; draining swamps; building coastal or riverine fortifications; infrastructure projects; road, rail and canal networks, resource extraction and so on.⁵⁷ Physical geographers call this ‘anthropogeomorphology’, that is, the study of human impact on geomorphology.⁵⁸

54 S Dillon, *The Palimpsest: Literature, Criticism, Theory* (Bloomsbury, 2007).

55 B Davis, R Holmes & B Milligan, ‘Isthmus’ *Places Journal* (December 2015), available at <https://placesjournal.org/article/isthmus-panama-canal-expansion/> (last visited 20 July 2017). See also B Milligan, R Holmes & B Davis, ‘The Force of Things: Constructing the Panama Canal’ 4 *Landscape Research Record* (2015) 73; B Milligan, ‘Landscape Migration: Environmental Design in the Anthropocene’ *Places Journal* (June 2015), available at <https://placesjournal.org/article/landscape-migration/> (last visited 20 July 2017).

56 ACP, ‘Proposal for the Expansion of the Panama Canal: Third Set of Locks Project’, 24 April 2006, available at <http://ufdc.ufl.edu/AA00010750/00001> (last visited 7 July 2017).

57 For excellent studies of infrastructure and logistics see, among others, D Cowen, *The Deadly Life of Logistics: Mapping Violence in Global Trade* (University of Minnesota Press, 2014); K Easterling, *Extrastatecraft: The Power of Infrastructure Space* (Verso, 2014); K Hepworth, ‘Enacting Logistical Geographies’ 32 *Environment and Planning D: Society and Space* (2014) 1120; J Lecavalier, *The Rule of Logistics: Walmart and the Architecture of Fulfillment* (University of Minnesota Press, 2016).

58 Goudie & Viles (2010) ch. 6, especially 269-71. See also H Hawkins, *Creativity* (Routledge, 2016) ch. 10.

Historically some of the most important work on this from the perspective of the making and remaking of territory has been by Chandra Mukerji, in two remarkable books. In *Territorial Ambitions and the Gardens of Versailles*, she traces the parallel projects of, on the one hand, French court gardens, with their formal layout and land-shaping techniques; and on the other, the military engineering of France as a whole, creating its boundaries, fortifications, canals, forests and landscapes. Mukerji shows how the making of territory could be seen at both the small and large scale, shaping a court garden and a national landscape.⁵⁹

In her following book, *Impossible Engineering: Technology and Territoriality on the Canal du Midi*, she traces the 17th-century project of building a canal linking the Atlantic to the Mediterranean, a king- and court-led but locally built project which demonstrated the transformation of territory and the technical conquest of nature.⁶⁰ Originally named *Canale Royale des Deux Mers*, and built two centuries before the British canal system or the Erie canal, 'it was not technically possible according to the formal engineering knowledge of the period'.⁶¹ This was, in part, because 'at the divide between the Atlantic and Mediterranean watersheds, [the canal] reached 189 meters (620 feet) above sea level'. It required 100 locks to manage this.⁶² The amount of digging, tunnelling, earth relocation, bank reinforcement, running water through dry landscapes, hydraulics, bridge, lock, reservoir and holding tank construction and other ancillary building was substantial. As they came to realise, water loss, siltage and degradation of building materials made it a project of continual management, maintenance and repair.⁶³ Rainwater, floods, drought, sandbars and other challenges arose.⁶⁴ Mukerji describes it 'as a silent demonstration of disciplinary power over the earth . . . the cultural power of political territoriality';⁶⁵ though she notes that 'everywhere along the canal the earth and water

59 C Mukerji, *Territorial Ambitions and the Gardens of Versailles* (Cambridge UP, 1997). See also JW Konvitz, *Cartography in France, 1660–1848: Science, Engineering and Statecraft* (University of Chicago Press, 1987); T Conley, *The Self-Made Map: Cartographic Writing in Early Modern France* (University of Minnesota Press, 1996).

60 C Mukerji, *Impossible Engineering: Technology and Territoriality on the Canal du Midi* (Princeton UP, 2009).

61 Ibid xix.

62 Ibid 2.

63 S Graham & N Thrift, 'Out of Order: Understanding Repair and Maintenance' 24 *Theory, Culture & Society* (2007) 1.

64 Mukerji (2009) 204.

65 Ibid 2.

evaded the control of those who tried to build it, displaying the excess powers that nature could bring to human projects'.⁶⁶

In order to make such a thing possible, cartographic surveying, land purchase and engineering planning required analysis of the terrain through which it was to cut.⁶⁷ But it was also a project of reshaping that terrain. In her terms, strategics required logistics;⁶⁸ the political and legal required the scientific and the technical. For Mukerji the project showcased 'a modern logic of territorial administration based on "works" rather than "words"'; 'a matter of territorial governance'.⁶⁹ These descriptions certainly fit with my own understanding of a territory. But in the terms being developed in this lecture it was a geopolitical transformation of the geophysical, though still bound by its limitations and conditioned by the available political technologies.

More recent accounts include Olivier Razac's political history of barbed wire, which traces how this technology can enclose and produce spaces—from the prairies of the mid-West to the trenches of the First World War to the concentration camps of the Boer war and the Nazi regime.⁷⁰ Andrew Barry also traces what he calls 'material politics', focusing on the oil pipeline through the Caucasus, again shaping the physical landscape of the region through its construction, but demonstrating equally how the geophysics and geopolitics of the region acts as a limit to geoeconomic ambitions.⁷¹

There are also parallels in Shiloh Krupar's study of how military and nuclear toxic waste has left a lasting legacy on both bodies and the landscape; a project which shares some similarities with Rachel Woodward's work on military geographies.⁷² Rather than the traditional work of military geographies which looks at the impact of the landscape on the military, Woodward reverses the focus, looking at the impact of military presence, from bases to firing and

66 Ibid 204.

67 Ibid 28ff, on the 'geographers, engineers, and cartographers . . . foresters . . . *arpenteurs geometries*, or land surveyors'.

68 Ibid 215-16: 'Logistics per se has not been ignored by social theorists, simply blurred with strategics in both Marxist and Foucauldian ways' (216). See also C Mukerji, 'The Territorial State as a Figured World of Power: Strategics, Logistics, and Impersonal Rule' 28 *Sociological Theory* (2010) 402.

69 Mukerji (2009) 5, 35.

70 The English translation is of the first edition. See the extensively revised edition: O Razac, *Histoire politique du barbelé* (Flammarion, 2009).

71 A Barry, *Material Politics: Disputes along the Pipeline* (Wiley-Blackwell, 2013).

72 SR Krupar, *Hot Spotter's Report: Military Fables of Toxic Waste* (University of Minnesota Press, 2013); R Woodward, *Military Geographies* (Wiley-Blackwell, 2004); R Woodward, 'Military Landscapes: Agendas and Approaches for Future Research' 38 *Progress in Human Geography* (2014) 40.

exercise zones, on the environment and landscape. Similarly, Debbie Lisle has examined the interrelation between war, tourism and landscape.⁷³ It is not just the military: the impact of the gas, oil and coal industries on the landscape is also well known.⁷⁴

Environmental devastation is of course a long-standing tactic of military strategy from (possibly apocryphal) tales of the Romans ploughing salt into Carthage's soil, to scorched earth retreats in World War II, Agent Orange in Vietnam and Saddam Hussein's forces burning Kuwaiti oil wells and dumping oil into the Persian Gulf.⁷⁵ Both Adam Roberts and Bronwyn Leebaw have noted that the word 'environment' 'did not enter into international humanitarian law until 1976, with the passage of the Environmental Modification Convention in response to outrage over the use of Agent Orange in Vietnam'.⁷⁶ Of course, there were earlier protections of what we would *now* call the natural environment, but they related, in Roberts's terms, 'obliquely rather than directly'.⁷⁷

BEYOND DRY LAND

Territory has also generally been understood in relation to static, dry land. But the land/sea relation complicates some of these ideas. Although many land territories use coastlines as their borders, states also claim significant parts of the sea or ocean. There is an established body of international law on this question—the United Nations Convention on the Law of the Sea.⁷⁸ But as people like Phil Steinberg have pointed out, this becomes complicated when we look at ice, which can be solid or liquid at different times, blurring both geophysical states and legal regimes. Other geophysical issues also complicate this—coastal swamps or river deltas, glaciers, rivers, marshlands and so on. One

73 D Lisle, *Holidays in the Danger Zone: Entanglements of War and Tourism* (University of Minnesota Press, 2016).

74 See, among others, MT Huber, *Lifeblood: Oil, Freedom and the Forces of Capital* (University of Minnesota Press, 2013); T Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (Verso, 2011); S Bouzarovski, M Bradshaw & A Wocknik, 'Making Territory through Infrastructure: The Governance of Natural Gas Transit in Europe' 64 *Political Geography* (2015) 217.

75 B Leebaw, 'Scorched Earth: Environmental War Crimes and International Justice' 12 *Perspectives on Politics* (2014) 770.

76 Ibid 771. See also A Roberts, 'The Law and War and Environmental Damage', in JE Austin & CE Bruch (eds), *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives* (Cambridge UP, 2000) 50.

77 Roberts (2000) 50.

78 For a discussion, see, e.g., H Jones, 'Lines in the Ocean: Thinking with the Sea about Territory and International Law' 4 *London Review of International Law* (2016) 307.

of the key issues here is that these are dynamic features of the landscape, and so there are complications when we try to use them to demarcate political–legal regimes, both practically and conceptually.

In order to address these complexities, the ICE-LAW project has been established.⁷⁹ It is led by Philip Steinberg at Durham University's IBRU: Centre for Borders Research, and I lead the sub-project on territory. Initially the topic was on 'ice' in a specific sense, and legal issues around it. But in our discussions we moved from just this one object to use ICE as an acronym for 'indeterminate and changing environments', where 'LAW' is now an acronym for 'law, the Anthropocene and the world'. So, while ice is certainly a major focus of the work, and whilst legal questions remain central, we hope that it can encompass a broader range of concerns. It was sparked by some contemporary issues, especially in the Arctic, but there are many instances where questions need to be addressed.⁸⁰

In the Arctic, states are increasingly trying to map the seabed, and using this as a basis of some of their territorial claims. The question of resources is also sharpening the stakes; there are also environmental issues and the impact of climate change to take into account. Because ice that was previously there year-round is now melting, either entirely or on a seasonal basis, new issues are emerging. Previously icebound areas are now open to shipping, and so, for example, to the north of Canada there are issues emerging about what waters are 'internal', what open seas and what rights of navigation apply there. It has implications in terms of where people can live, migration routes for land and sea animals, the availability of resources and so on. There have been some suggestions that we need an Arctic treaty like the one that applies to the Antarctic, which suspends territorial claims to that continent. But there are at least two crucial differences between the Antarctic and the Arctic. The Arctic has indigenous populations who inhabit the land and ice that is being contested, whereas Antarctica's population is a transient one made up of scientists and environmentalists. And whereas Antarctica is a land mass with an ice sheet above and beyond it, the bulk of what is being contested in the Arctic is ice, open water or a mixture of the two, on a seasonal basis. There are of course land masses within the Arctic, but the borders of those are largely fixed, even if there are remaining disputes. As soon as you look at the water and ice, it becomes much more complicated. IBRU colleagues produced a map of

79 ICE LAW Project, 'Welcome', available at <https://icelawproject.org/> (last visited 7 July 2017).

80 On the polar regions, see K Dodds and M Nuttall, *The Scramble for the Poles: The Geopolitics of the Arctic and Antarctic* (Polity, 2016); A Howkins, *The Polar Regions: An Environmental History* (Polity, 2016).

Maritime jurisdiction and boundaries in the Arctic region a few years ago, recently updated, which shows the various claims to different portions of the region. Like most maps though, this focuses on the surface boundary divisions, which become increasingly complicated if you look below the surface, into mineral resources, the sea and the seabed.⁸¹

One of my contributions to the initial workshop of the ICE LAW project was to speak about my work on territory. I began by saying that I was not surprised that people were finding traditional understandings of territory inadequate to understand issues around ice, the sea and so on. The reason I was not surprised was because I thought that traditional understandings were also inadequate in grasping complexities around territory on land. I then tried to outline the approach my work takes and suggested that rather than searching for a fixed definition, itself bounded, controlled and discrete, we would do better to think about the different aspects of territory that were at stake, and let its sense and use emerge from that inquiry.⁸² The work of the ICE-LAW project on the geophysical and the material has led me to this current rethinking of my own research on territory, by bringing into prominence the notion of terrain, even as I hope my previous work is useful for others.

TERRAIN'S VOLUME

Terrain is crucial because it combines materiality and strategy—the physical and human dimensions of geography, and the way they complicate political and legal questions. But terrain also requires us to go beyond a narrow, flattened sense of space, what might be called the cartographic imagination. Representations of complex landscapes are frequently reduced to a plane, where shapes meet, separated by a line, a border. In that imagination, not only are complex three-dimensional spaces represented on a two-dimensional surface, but it also fixes earth processes at a single point in time.

Terrain, by its very nature, helps us to break from the flat, surface, areal sense of much of political–legal geography. Yet maps have long tried to grapple with how to represent height and depth on their (usually) two-dimensional surface. Contour lines and relief shading are two of the more common, but as techniques develop, different possibilities emerge. Terrain forces us to account for the complexity of height and depth, the question of *volume*. Understanding

81 IBRU: Centre for Borders Research, 'Arctic Maps', available at <https://www.dur.ac.uk/ibru/resources/arctic/> (last visited 7 July 2017).

82 S Elden, 'Dynamic Territories', *ICE LAW Project*, available at <https://icelawproject.org/reflections-2/dynamic-territories/> (last visited 7 July 2017).

political spaces as volumes, considering and analysing questions of height and depth, of what is above and below the surface, was a crucial development in my work on territory, and will inform the development of a theory of terrain.⁸³

An extreme example of the state production of space can be seen in the West Bank where the line between civil and military engineering is extremely blurred. Fundamental is the pioneering work of architect Eyal Weizman, who critically analysed the contested spaces of the West Bank and Gaza as three-dimensional, in which space is not just where violence occurs, or the stake of the struggle, but the very medium through which it is conducted.⁸⁴ This includes both built infrastructure and its interaction with the physical nature of the landscape. This is not just the building of houses in settlements, though their situation on hilltops is an important instance of the relation of terrain. Nor is it just the wall/fence of the ‘separation barrier’ itself, but also the sundry other civil engineering projects—of the walls and fences, tunnels, bridges, roads, flyovers, roadblocks and checkpoints—that are associated with the administration of the occupied territories. Included here is also the highly political infrastructure of drainage and irrigation pipes and cables. This work is complemented by Stephen Graham’s exploration of how a vertical perspective changes how we understand the spaces of a city, building on his earlier work on how cities are made—infrastructure projects—and unmade—targeted and destroyed in war.⁸⁵ It can also be complemented by a range of analyses of urban exploration.⁸⁶ But much of this work has a focus on the built landscape, and the suggestion here is that we need to push further into the geophysical.

In doing so, this work further challenges attempts to restrict terrain solely to land, which is unhelpful in dealing with the complexities of the land–sea interface. As Steinberg and Kimberley Peters suggest, it is important to break from fixed and grounded understandings of matter. Their specific focus is the

83 S Elden, ‘Secure the Volume: Vertical Geopolitics and the Depth of Power’ 32 *Political Geography* (2013) 35. See also C Grundy-Warr, M Sithirith & Y Ming Li, ‘Volumes, Fluidity and Flows: Rethinking the “Nature” of Political Geography’ 45 *Political Geography* (2015) 93.

84 E Weizman, *Hollow Land: Israel’s Architecture of Occupation* (Verso, 2007); R Segal & E Weizman, *A Civilian Occupation: The Politics of Israeli Architecture* (Babel and Verso, 2003). See also A Ophir, M Givoni & S Hanafi, *Power of Inclusive Exclusion: Anatomy of Israeli Rule in the Occupied Palestinian Territories* (Zone Books, 2009). More generally on the use of the term ‘terrain vague’ in architecture, see P Barron & M Mariani (eds), *Terrain Vague: Interstices at the Edge of the Pale* (Routledge, 2013).

85 S Graham & S Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (Routledge, 2001); S Graham, *Cities under Siege: The New Military Urbanism* (Verso, 2011); S Graham, *Vertical: The City from Satellites to Bunkers* (Verso, 2016).

86 See, e.g., BL Garrett, *Explore Everything: Place-Hacking the City* (Verso, 2013) and the references in Elden, ‘Secure the Volume’ (2013). For a valuable collection of essays, see L Bennett (ed.), *In the Ruins of the Cold War Bunker: Affect, Materiality and Meaning Making* (Rowman and Littlefield International, 2017).

ocean, seen as a way of engaging with fluidity and flow rather than fixity. The deep oceans have, as technology has developed, become another site for contestation and resource exploitation.⁸⁷ Their work acts as a spur for work on terrain to go beyond simple gas–liquid–solid divisions, which arguably structure the land–sea–airspace divide in contemporary political–legal territorial regimes. Such issues are becoming ever more pressing with the impacts of climate change—coastlines are changing; islands are being submerged; glaciers are melting and previously frozen sea routes are becoming open.⁸⁸ All these material processes are transforming territory. Taking the measure of these geophysical factors is crucial for a political–legal theory of territory more generally; the ‘volumetric’—a term used in cartography and physics—is helpful here, since it grasps the mechanisms of calculating, measuring, surveying, managing, controlling and ordering (the metric) that constitute the political technology of territory, understood as a volume. The volumetric has been used by Klaus Dodds and Mark Nuttall to analyse the contested spaces of the Arctic and Antarctic, especially concerning the contested mapping, exploration and exploitation of the deep-seabed.⁸⁹ Rachel Squire has also adopted it to think about Gibraltar, and US undersea bases in the Cold War.⁹⁰ We can then speak about volumetric territory or, taking the materiality fully into account, volumetric terrain.

87 P Steinberg & K Peters, ‘Wet Ontologies, Fluid Spaces: Giving Depth to Volume through Oceanic Thinking’ 33 *Environment and Planning D: Society and Space* (2015) 247. See also J Hannigan, *The Geopolitics of Deep Oceans* (Polity, 2016).

88 On islands, see MB Gerrard & GE Wannier (eds), *Threatened Island Nations: Legal Implications of Rising Seas and a Changing Climate* (Cambridge UP, 2013), especially JG Stoutenberg, ‘When Do States Disappear?: Thresholds of Effective Statehood and the Continued Recognition of “Deterritorialized” Island States’ in Gerrard & Wannier (2013) 57; C Schofield & D Freestone, ‘Options to Protect Coastlines and Secure Maritime Jurisdictional Claims in the Face of Global Sea Level Rise’ in Gerrard & Wannier (2013) 141; L Yamamoto & M Esteban, *Atoll Island States and International Law: Climate Change Displacement and Sovereignty* (Springer, 2014); and the literature here: I Kelman, ‘Small Island Developing States (SIDS) and Climate Change: Peer-Reviewed Papers’, available at <http://www.islandvulnerability.org/docs/islandsclimatechange.pdf> (last visited 7 July 2017). On glaciers and mountains, see R Baghel & M Nüsser, ‘Securing the Heights: The Vertical Dimension of the Siachen Conflict between India and Pakistan in the Eastern Karakoram’ 48 *Political Geography* (2015) 24; M Ram, ‘Colonial Conquests and the Politics of Normalization: The Case of the Golan Heights and Northern Cyprus’ 47 *Political Geography* (2015) 21; the work of the Italian Limes project: ‘Italian Limes: Mapping the Shifting Border through Italy’s Alpine Glaciers’, available at <http://italianlimes.net/index.html> (last visited 7 July 2017). From a more cultural perspective, see D Cosgrove & V Della Dora (eds), *High Places: Cultural Geographies of Mountains and Ice* (IB Tauris, 2008).

89 Dodds and Nuttall (2016) especially ch. 3.

90 R Squire, ‘Rock, Water, Air and Fire: Foregrounding the Elements in the Gibraltar–Spain Dispute’ 34 *Environment and Planning D: Society and Space* (2016) 545; Squire, ‘Immersive Terrain’ (2016).

NATURE AND OTHER MATERIALITIES

In his work on ‘the natures of war’, Derek Gregory proposes a ‘corpography’ in opposition to the cartographic imaginary—that focuses upon the soldiers’ lived experience of military violence compared to an abstract analysis of surveillance, planning and logistics. Accordingly he looks at the biophysical features of war—the interrelation of bodies and spaces in armed conflict—in three material registers: the mud of the First World War, the deserts of North Africa in the Second World War, and the rainforests of Vietnam.⁹¹ Pip Thornton at Royal Holloway has also written compellingly on her own experience as an army reservist sent to Iraq.⁹²

Gastón Gordillo has also suggested that terrain is ‘the only spatial category that (in contrast to place, territory, or landscape) evokes material forms, volumes and textures that are not reducible to human control and appropriations’.⁹³ As Gordillo suggests: ‘terrain’s materiality is not reducible to social constructions and can be best understood through a geometrical examination of bodies in motion’.⁹⁴ His response when I asked him about this in an interview was revealing:

Yes, I think that the question of terrain is perhaps the last frontier in our conceptions about space, in the sense that whereas we count on a very rich, sophisticated literature on place, space, landscape, or territory, there’s very little on terrain. You’re in fact one of the very few people who’s written about terrain, in particular in relation to territory. And as you know, terrain is usually used vaguely and in passing, as a purely descriptive term. We hear about terrain, for instance, in references to rugged terrains involving military operations, geological surveys, or outdoor activities, but that’s all. So my aim is to examine in detail what terrain is, as a concept but also in relation to actual terrains.⁹⁵

91 D Gregory, ‘The Natures of War’ 48 *Antipode* (2016) 3.

92 P Thornton, ‘The Meaning of Light: Seeing and Being on the Battlefield’ 22 *Cultural Geographies* (2015) 567.

93 G Gordillo, ‘The Metropolis: The Infrastructure of Empire’, in K Hetherington (ed.), *Infrastructures: Environment and Life in the Anthropocene* (Duke UP, forthcoming). See also see G Gordillo, ‘The Forests Destroyed by Bulldozers: An Affective Geometry of the Argentine Soy Boom’ *American Ethnologist* (forthcoming).

94 G Gordillo, ‘Terrain as Insurgent Weapon’, *Space and Politics*, 27 February 2015, available at <http://spaceandpolitics.blogspot.co.uk/2015/02/terrain-as-insurgent-weapon.html> (last visited 7 July 2017). See also G Gordillo, *Rubble: The Afterlife of Destruction* (Duke UP, 2015). Gordillo’s projected book, under the current working title *Opaque Planet: Outline of a Theory of Terrain*, intends to develop these ideas.

95 ‘On the Afterlife of Destruction: Gastón Gordillo, Interviewed by Stuart Elden’, *Society and Space*, 18 April 2014, available at <http://societyandspace.org/2014/04/18/on-9/> (last visited 7 July 2017).

In our discussions it has become clear that while my analysis of terrain is principally a project to understand the materiality of territory; for him the purpose is to understand terrain in itself.

More broadly, this work connects to wider debates about materiality and the interaction of human and non-human materialities, especially in Karen Barad's and Jane Bennett's pioneering work,⁹⁶ but it is also part of wider attempts at rethinking the 'geo' element in the term 'geopolitics'. Elizabeth Grosz has suggested the idea of geopower as a broader frame within which geopolitics operates:⁹⁷

The relations between the earth and its various forces, and living beings and their not always distinguishable forces, are forms of geopower, if power is to be conceived as the engagement of clashing, competing forces ... Power—the relations between humans, or perhaps even between living things—is a certain, historically locatable capitalisation on the forces of geopower.⁹⁸

Within a wider rethinking of geopower we can then resituate what we mean by geopolitics, as a politics of the earth. As I have suggested elsewhere:

at its best, such a politics of the earth would take into account the power of natural processes or resources; the dynamics of human and environment; the interrelation of objects outside of human intervention; the relation between the biosphere, atmosphere and lithosphere; and the complex interrelations that produce, continually transform and rework the question of territory and state spatial strategies.⁹⁹

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- 96 K Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Duke UP, 2007); D Coole & S Frost (eds), *New Materialisms* (Duke UP, 2010); J Bennett, *Vibrant Matter: A Political Ecology of Things* (Duke UP, 2010); WE Connolly, *The Fragility of Things: Self-Organizing Processes, Neoliberal Fantasies, and Democratic Capitalism* (Duke UP, 2013); M Boscagli, *Stuff Theory: Everyday Objects, Radical Materialism* (Bloomsbury, 2014); J Dittmer, 'Geopolitical Assemblages and Complexity' 38 *Progress in Human Geography* (2014) 385; V Squire, 'Reshaping Critical Geopolitics? The Materialist Challenge' 41 *Review of International Studies* (2015) 139.
- 97 E Grosz, *Chaos, Territory, Art: Deleuze and the Framing of the Earth* (Duke UP, 2008); K Yusoff, E Grosz, A Saldanha, C Nash & N Clark, 'Geopower: A Panel on Elizabeth Grosz's *Chaos, Territory, Art: Deleuze and the Framing of the Earth*' 30 *Environment and Planning D: Society and Space* (2012) 971; D Depledge, 'Geopolitical Material: Assemblages of Geopower and the Constitution of the Geopolitical Stage' 45 *Political Geography* (2015) 91.
- 98 Yusoff et al. (2012) 975. Grosz has worked some of these questions through in relation to Charles Darwin in E Grosz, *The Nick of Time: Politics, Evolution, and the Untimely* (Duke UP, 2004); E Grosz, *Time Travels: Feminism, Nature and Power* (Duke UP, 2005); and E Grosz, *Becoming Undone: Darwinian Reflections on Life, Politics and Art* (Duke UP, 2011).
- 99 S Elden, 'Foucault and Geometrics' in P Bonditti, D Bigo & F Gros (eds), *Foucault and the Modern International: Silences and Legacies for the Study of World Politics* (Palgrave Macmillan, 2017) 295, 299.

This expanded sense of geopolitics would sit alongside, rather than replace, the attention given to biopolitics in recent years. Work on these themes makes use of the resources of geopower and geophilosophy,¹⁰⁰ as well as attempts to think about philosophy and earth sciences.¹⁰¹

Much work engaging with these questions has made use of the term 'Anthropocene', which has been useful in understanding the relation between human action and environmental transformation. If political geography and geopolitics are to live up to the promise of their names, which stress the relation between politics and geo-processes, then it is crucial that they are at the very forefront of such debates.¹⁰² However, the term 'Anthropocene' has also been criticised for its anthropocentric name, as well as its dating, with the suggestion that 'Capitalocene' might be more appropriate.¹⁰³ Steinberg and Peters similarly challenge it for being too tied to geology, to layers and strata, rather 'the dynamic materiality of incessant movement and transformation'.¹⁰⁴ The work here seeks to develop these arguments.

CONCLUSION

Terrain here, then, does not mean something static, something fixed, which can be opposed to the dynamic nature of water; thus reinforcing a problematic land/sea binary. Thinking this through is not intended to just be a politics of solid land, but as a way of making sense of water, ice, the sub-soil and the submarine. Territory, understood in this geophysical sense as terrain, is always mobile, dynamic.

100 G Deleuze & F Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. B Massumi (Athlone, 1988); G Deleuze & F Guattari, *What is Philosophy?*, trans. H Thompson & G Burchell (Columbia UP, 1994); M Bonta & J Protevi, *Deleuze and Geophilosophy: A Guide and Glossary* (Edinburgh UP, 2004); B Woodard, *On an Ungrounded Earth: Towards a New Geophilosophy* (Punctum Books, 2013).

101 R Frodeman, *Geo-logic: Breaking Ground between Philosophy and the Earth Sciences* (SUNY Press, 2003); J Protevi, *Life, War, Earth: Deleuze and the Sciences* (University of Minnesota Press, 2013); B Cache, *Earth Moves: The Furnishing of Territories*, trans. A Boyman (MIT Press, 1995) ch. 1.

102 See, e.g., S O'Lear & S Dalby (eds), *Reframing Climate Change: Constructing Ecological Geopolitics* (Routledge, 2016).

103 JW Moore, *Capitalism in the Web of Life* (Verso, 2015) ch. 7; JW Moore (ed.), *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism* (PM Press, 2016).

104 Steinberg and Peters (2015) 255. The use of 'geology' is expanding: see, e.g., 'Political Geology: Stratigraphies of Power' (Centre for the Study of Environmental Change and the Lancaster Environment Centre, Lancaster University, 21 June 2012), available at http://www.research.lancs.ac.uk/portal/files/15076528/Political_Geology_flier.pdf (last visited 7 July 2017); J Parikka, *A Geology of Media* (University of Minnesota Press, 2015).

Terrain encompasses slope, texture and matter in motion, and should include spatial process as well as form. Instead of static representations, terrain helps to understand dynamic spaces. Terrain makes possible, or constrains, political, military and strategic projects, even as it is shaped by them. It is where the geopolitical and the geophysical meet.

Two immediate cautions go with this work. The first is the spectre of geographical or environmental determinism, the view that human development is conditioned by the natural environment. This has been used in the past to legitimate colonial practices and racial stereotypes, but is enjoying something of a resurgence today in the work of Robert Kaplan and perhaps could be found in the popular work of Tim Marshall.¹⁰⁵ The second caution is that appeals to the Earth as a ground of politics have often accompanied regressive political movements. From Halford Mackinder's contested theory of the heartland to Friedrich Ratzel's notion of *Lebensraum*,¹⁰⁶ Martin Heidegger's distinction between the Earth and the world (*Erde* and *Welt*), and his reimagining of autochthony,¹⁰⁷ and Carl Schmitt's *Nomos* of the earth (*Erde*), there are ideas that were in each case partnered by deeply unpleasant politics.¹⁰⁸

Both are, of course, to be avoided, but neither of these very valid concerns should be taken to say we should ignore the physical, material entirely. Indeed, there is a very valuable literature thinking about the relation between nature, the social and capital,¹⁰⁹ very much a project from the Left. Indeed, this sense of terrain is close to how Foucault understands the notion of a milieu: 'an ensemble of natural givens—rivers, marshes, hills—and an ensemble of artificial

105 RD Kaplan, *The Revenge of Geography: What the Map Tells Us about Coming Conflicts and the Battle against Fate* (Random House, 2012); T Marshall, *Prisoners of Geography: Ten Maps that Tell You Everything You Need to Know about Global Politics* (Elliott & Thompson, 2015). For a critique of the term, often levelled at his own work, see J Diamond, 'Geographic Determinism: What Does "Geographic Determinism" Really Mean?', available at http://www.jareddiamond.org/Jared_Diamond/Geographic_determinism.html (last visited 7 July 2017). For a discussion, see Howkins (2016) 36-39.

106 See G Kearns, *Geopolitics and Empire: The Legacy of Halford Mackinder* (Oxford UP, 2009).

107 See C Bambach, *Heidegger's Roots: Nietzsche, National Socialism and the Greeks* (Cornell UP, 2003); S Elden, *Speaking Against Number: Heidegger, Language and the Politics of Calculation* (Edinburgh UP, 2006).

108 C Schmitt, *Der Nomos der Erde im Völkerrecht des Jus Publicum Europaeum* (Duncker & Humblot, 1997) [1950]; C Schmitt, *The Nomos of the Earth in the International Law of the Jus Publicum Europaeum*, trans. GL Ulmen (Telos Press, 2003). See also S Elden, 'Reading Schmitt Geopolitically: *Nomos*, Territory and *Großraum*' 161 *Radical Philosophy* (2010) 18.

109 See, e.g., N Smith, *Uneven Development: Nature, Capital and the Production of Space*, 2nd ed. (Blackwell, 1990); N Castree & B Braun, *Social Nature: Theory, Practice and Politics* (Blackwell, 2001).

givens—an agglomeration of individuals, of houses etc. The milieu is a certain number of combined, overall effects bearing on all those who live in it'.¹¹⁰

Any adequate theory of terrain will need to be historically informed, and theoretically sophisticated, but it must also aspire to be of use to political and legal practitioners with relation to contemporary examples including sea-ice melt in the Arctic, sea level rise, glaciers, river boundaries and desertification. Territory's materiality encompasses the built and physical landscape and their interrelation. To make sense of this I think we need to develop a political–legal theory of terrain.

110 M Foucault, *Securité, Territoire, Population: Cours au Collège de France 1977-1978*, ed. M Senellart (Seuil & Gallimard, 2004) 22-23; M Foucault, *Security, Territory, Population: Lectures at the Collège de France 1977-1978*, ed. M Senellart, trans. G Burchell (Palgrave, 2007) 21.