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THEMED INTERVENTION

Mapping, geography

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Abstract

This Themed Intervention consists of short papers written by nine plenary speakers at the 2024 Annual Conference of the Royal Geographical Society with the Institute of British Geographers plus a paper by the Society's Cartographic Collections Manager. In this introduction, I explain why I chose mapping as the conference Chair's theme. I give a sense of how the relationship between geography and mapping has been addressed through previous conference addresses and themes. I then explore three types of cartographic genealogies. The first shows how histories of cartography traditionally took the form of family trees. The second explores disjunctures between previous phases of cartography and brings us to current definitions of mapping. The third genealogy is that of previously subjugated forms of mapping knowledge and practice which are now defining features of the field (critical quantitative; empire, race, and Indigenous; counter-; representational and more-than-representational).

KEYWORDS

cartography, counter-cartography, genealogy, geography, mapping, more-than-representational

In 2023, Eden Kinkaid and Cassidy Schoenfelder launched their co-edited edition of *you are here: the journal of creative geography*.[1] The theme was 'counter/cartographies' and the call for submissions elicited 300 responses, ranging across media, region of working, and disciplines. The collection opened with a piece that was, as Kincaid (2023, p. vii) put it, an 'experiment with cartographic conventions' producing an 'uncanny if not unrecognizable' map. Ray Verrall's (2023) *Atlas* traced the border of approximately 250 maps and then overlaid them into a circular shape at once both recognisable and not (Figure 1). The re-working of Earth hints at subversive attacks on the very idea of cartography and its borders, harking back to satires by Mark Twain, Lewis Carroll, and Jorge Luis Borges (Edney, 2019, p. 10). But *Atlas* also demonstrates the exciting potential for art to remake cartography and forge new understandings of spatial relationships. The static image published in the journal both refuses the cartographic conventions of a world divided into sovereign territories and represents the overlapping, lived, and messy boundaries that the world makes for us and allows us to make. This is not an *Apollo's Eye* (Cosgrove, 2001) vision nor a networked world of globalisation. Rather, this is something closer to 'planetarity' (see Jazeel, 2019, p. 167), a living and alive world, of emergent life and movement. This is even more apparent in the animated version of the artwork (Figure 2), where the borders dance and commingle; a dazzling retina that invites us to reflect on how we see our world and how re-mapping it might help us see it anew.

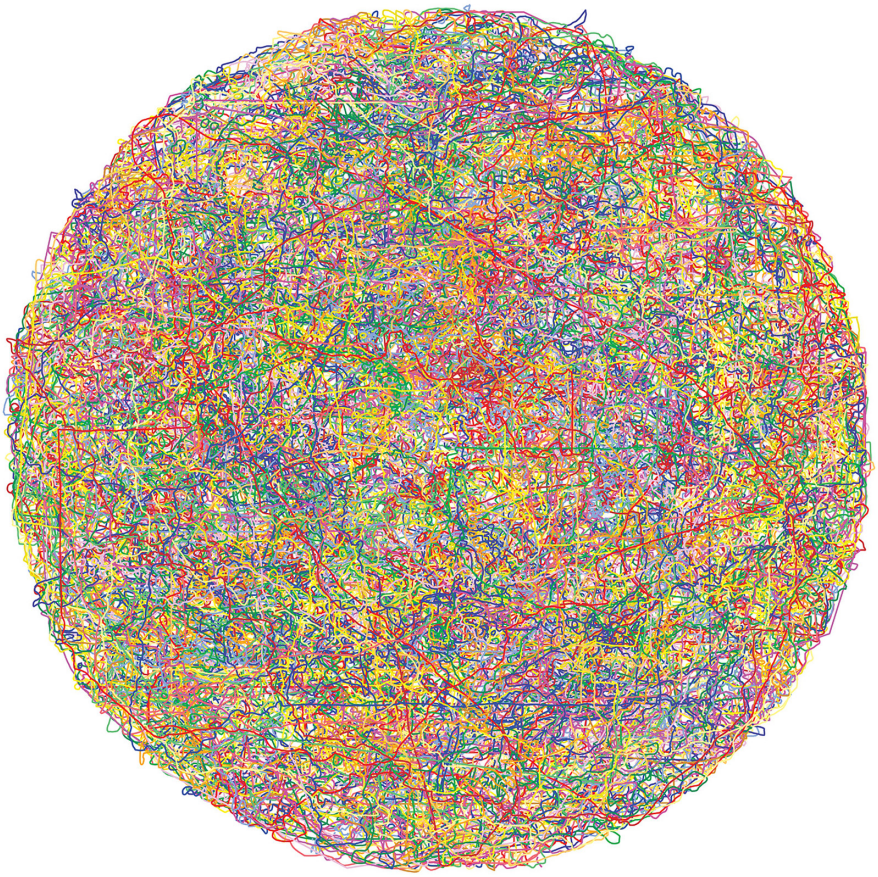


FIGURE 1 Atlas (superimposed outlines of the world's countries, nations, and territories, variably scaled to fit within a circle). Reproduced with permission of Ray Verrall.

Inspired by such interventions, I chose mapping as the Chair's theme for the Royal Geographical Society with the Institute of British Geographers' (RGS-IBG) 2024 Annual Conference. Like many geographers, I do not specialise in mapping but have returned to it throughout my career, as something I study, as something I do, and as something that speaks to my deeper-seated sense of being a geographer. The theme also recognises not just the lasting but also the increasing popularity of maps more broadly. Shortly after announcing the conference theme in autumn 2023, the *Guardian* newspaper declared 'Britons go map-crazy', citing the popularity of online mapping games, digital map sales, and popular Twitter/X feeds.[2] This followed the bestselling publication of *A History of the World in Twelve Maps* (Brotton, 2013) and *Prisoners of Geography: Ten Maps that Tell your Everything you Need to Know about Global Politics* (Marshall, 2016), but also of successful and garlanded volumes by geographers such as *Blank Spots on the Map: The Dark Geography of the Pentagon's Secret World* (Paglen, 2009), *Atlas of Epidemic Britain: A Twentieth Century Picture* (Smallman-Raynor & Cliff, 2012), *Off the Map: Lost Spaces, Invisible Cities, Forgotten Islands, Feral Places and What They Tell Us About the World* (Bonnett, 2014), and *Atlas of the Invisible: Maps & Graphics That Will Change How You See the World* (Cheshire & Uberti, 2021).

Grumbling beneath this surface success of the geography–mapping relationship, however, is a deeper anxiety. In 1989, J B Harley had worried that geographers were turning against the use of maps and losing knowledge of how they were made, allowing 'them to slip into our past as some ancient hieroglyphic of a forgotten age' (Harley, 1989, p. 87). Nearly 20 years later, Denis Cosgrove (2008) noted the decline of cartography courses in geography curricula since the 1990s, inversely mirroring the massive broader uptake of map-making. In the same year. Dodge and Perkins (2008) suggested that geographers had left mapping to technicians and Geographical Information Science (GIS) 'geeks' (*sic*); that this very journal had seen a marked decline in papers featuring maps; that the 2007 RGS-IBG Annual Conference had only one panel that explicitly considered mapping; and, the crowning insult, that the conference programme's visual guide to South Kensington had been reproduced from Google Maps. Critical cartography did, however, show signs of a revived and invigorated interest in mapping within geography.

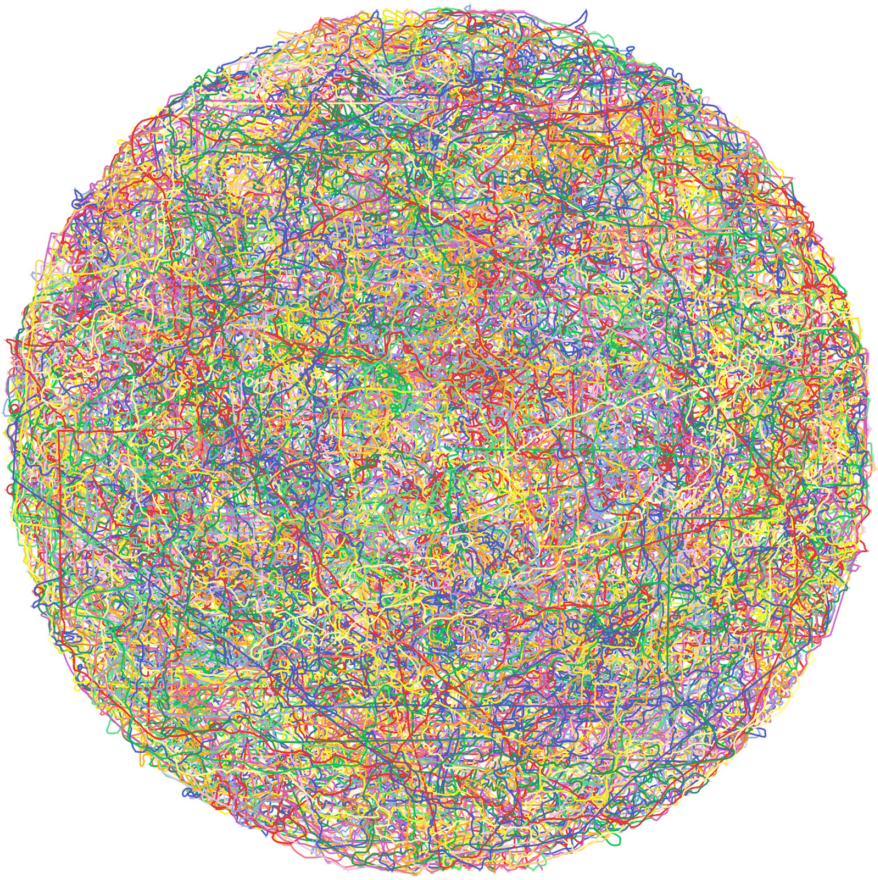


FIGURE 2 *Atlas* (animated version). Reproduced with permission of Ray Verrall. For the moving image please see the online version.

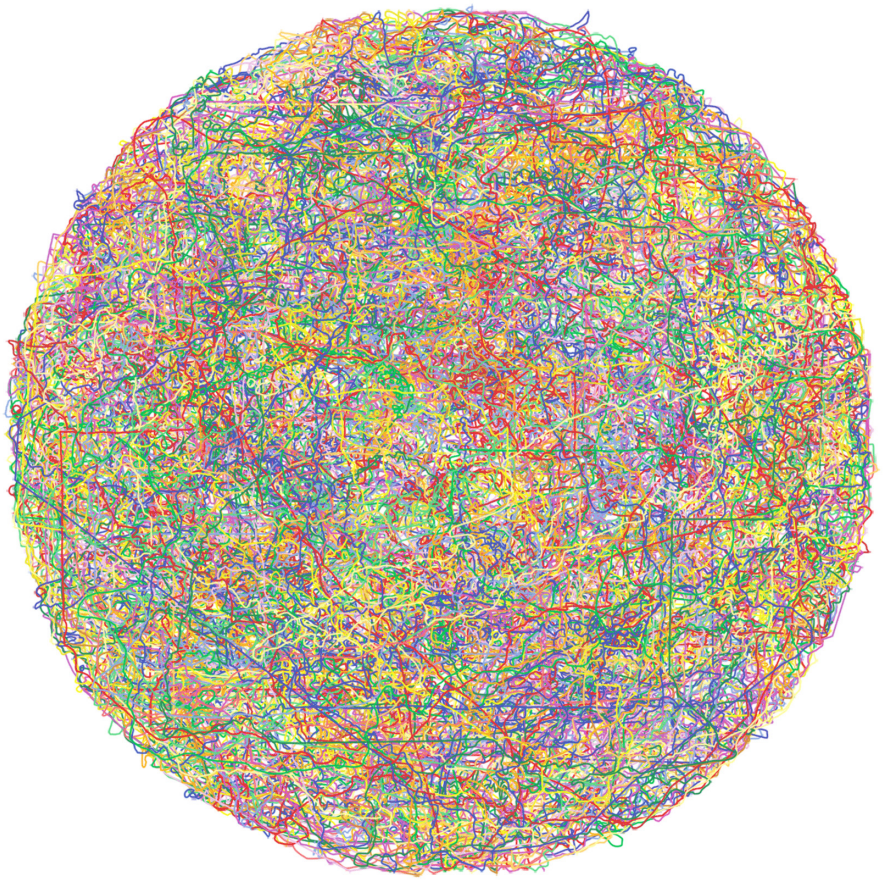
This introduction cannot hope to summarise the broader developments in the ongoing relationship between mapping and geography (for an effective and accessible introduction see Duggan, 2024; also van Houtum, 2024). Rather, it introduces some useful features from past and present debates that will hopefully be of interest to geographers and others, including those who have not worked on mapping before, or those who have but would like to reflect a little more on how they have done so, and why. Summaries of the papers in this collection are situated in the survey below, the scope of which could be disorientating (for Gerlach, 2017 the performance most associated with maps is getting lost). Fathoming the relationship between mapping and geography is an old challenge, and I open with four publications resulting from annual IBG conferences that help us navigate some of this history. They highlight changing views on the status of mapping in the discipline, how adequate it was felt to be, how mapping intersected with other methods, and how the map fared in the debate over description versus explanation in geography.

1 | MAPPING AT IBG CONFERENCES

> The eye cannot encompass at one sweep the vast and complicated panorama of the landscape, and parts of it, at least, are not inter-visible. Besides, the eye plays us tricks; how formidable the opposite hill seems from the brow across the valley, and how it flattens and loses its terror as we coast down to the valley floor. How smooth a summit ridge may appear from five miles away but what a different impression when we walk it. So, even if landscape could all be seen at once, the precise relationships and height could not be measured by an organ so susceptible to illusion, and the geography erected on such optical illusions would itself be illusory. Accurate measurement and plotting of the data are an indispensable preliminary to any geographical study that purports to be more than reconnaissance. For this we have come to rely on the surveyors and cartographers, and we are deeply in their debt for it.
>
> (Miller, 1948, pp. 1–2)

The above was delivered by A. Austin Miller in his Presidential Address to the IBG conference in January 1948. He had opened by setting out the broader scale for his 'Dissection and Analysis of Maps', noting that a pioneer geographer on visiting unmapped territory felt that his first duty was to produce a map, being 'one of the essential provisions of civilization' (Miller, 1948, p. 1). The history and utility of the map was clearly inseparable from the imaginary and actualised geographies of empire. But the chief geography that mapping engaged was landscape, so as to undo its ocular dependency and illusions. The map itself, however, came with its own dangers for the geographer. Its entrancing detail led, too easily, to rounds of needless description, and students were warned from 'a loose translation into the clumsy language of words from the concise and precise shorthand of the map ... Unless he [*sic*] is taught to proceed further and to appreciate the grammar of the map and to get at the ideas it contains, he may waste his whole geographical career in mere unprofitable translation' (Miller, 1948, p. 12). While geographical facts were not subject to such precise laws as nature, geographers were encouraged to subject their data to the greatest stringency in 'our search for truth. Excavate beneath the surface of the map. Everything it shows is pregnant with possibilities waiting to be uncovered' (Miller, 1948, p. 13).

Five years later, H C Darby (1953) gave a lecture at the IBG conference, in a joint address to the RGS and the Geographical Association. Although the focus of his lecture was the relationship between geography and history, mapping did not feature much, other than as a metaphor for what he was not attempting to do in the lecture. Darby was a pioneer, however, of the use of mapping as a principal means of geographical understanding, in his case of understanding the places and distributions of the eleventh-century English Domesday book. Nine years after his lecture, in a Presidential Address to the IBG conference, Darby (1962) put mapping at the centre of his consideration of the 'Problem of Geographical Description'. Darby's problem and his analysis had striking parallels to those of Miller 14 years earlier. The relationship of the map to landscape was central, the map being able to convey at once a landscape that no one eye could simultaneously survey. The relationship between the map and the word troubled Darby as much as Miller: 'there still remains the inherent difficulty of conveying a visual impression in a sequence of words' (Darby, 1962, p. 1). Unlike Miller, however, Darby did not believe geography to be objective. But this did not mean that geography could not surpass



VIDEO 1 *Atlas* (animated version). Reproduced with permission of Ray Verrall.

description to achieve explanation. Maps might provide one means, among many, of equipping geographers to transcend regional description and achieve a broader form of explanatory value.

This urge was part of the broader quantitative turn in geography. From the end of the Second World War to the 1960s, geographers and cartographers pioneered the mapping of positivist laws, presented as closed systems (Dorling & Fairbairn, 1997). These abstract mappings were rejected, from the 1970s, by Marxists, for neglecting socio-economic explanations, and humanists, for neglecting the subjective views of the map-maker, map-reader, and map-user. From the 1990s, the new cultural geography, and postmodernism more broadly, criticised the idea of coherent meta-narratives that underlay more quantitative maps. This opened the ground for a return to the more esoteric forms of mapping that geographers engage today, though ones no less technical or data-based than the maps of the quantitative revolution. Alongside and outside of these debates, however, computer sciences had been changing the ways in which geographers and cartographers mapped the world (due to the rise of GIS, Global Positioning System [GPS] data and online mapping), bifurcating critical and applied cartographic debates (Kitchin, 2014).

Before turning to some of these developments in more detail, we conclude with the Chair's Theme of the 2011 RGS-IBG Annual Conference, 'Geographical Imagination'. Stephen Daniels (2011) traced this concept widely across the discipline's history, but returned repeatedly to mapping, as a creative means of re-imagination; map-making as a model for geographical knowledge and as a means of propaganda; and map libraries as archives of imagination. As with the conference addresses above, mapping and landscape sit side by side here, landscape being primarily a form of imagining geography and remaking it in its image. The binary relationship between the map and the landscape (objective–subjective, quantitative–qualitative, real–imaginary) is mostly gone. But the map must still transcend landscape: 'Maps work, essentially, by helping people to visualise the unseeable' (Dodge et al., 2011c, p. xx). The map's ability to scale space brings it great power, which has led many to reject the form and the method entirely. As Chris Perkins (2004) noted 20 years ago, many critical geographers had abandoned mapping, while critical cartography tended to be more wordy than visual. In the meantime, non-geographers had led on the development and application of new forms of mapping. This is no longer the case, but in the section below I present three genealogies that help us better understand how we came to where we are and where we might go with mapping.

1.1 | Cartographic genealogies

There are ample collections that survey cartographic literatures (Crampton, 2006; Dodge et al., 2011a; Edney, 2019; Kent & Vujakovic, 2017; Rossetto & Lo Presti, 2024) and the histories of cartography.[3] Here I present three genealogies, moving from the popular understanding of the term to how it has been used by critical theorists, geographers, and others. First, I explore the ways in which the history of mapping has been told as that of a family tree, and who or what this includes and excludes. Second, I present some of the disjunctures in the historical relationships between particularly prominent cartographers that help us understand the power dynamics at play in these evolving forms of knowledge and practice. And, finally, I outline some of the previously subjugated forms of mapping knowledge and practice that are now at the forefront of cartographic craft.

2 | GENEALOGY I: THE CARTOGRAPHIC FAMILY

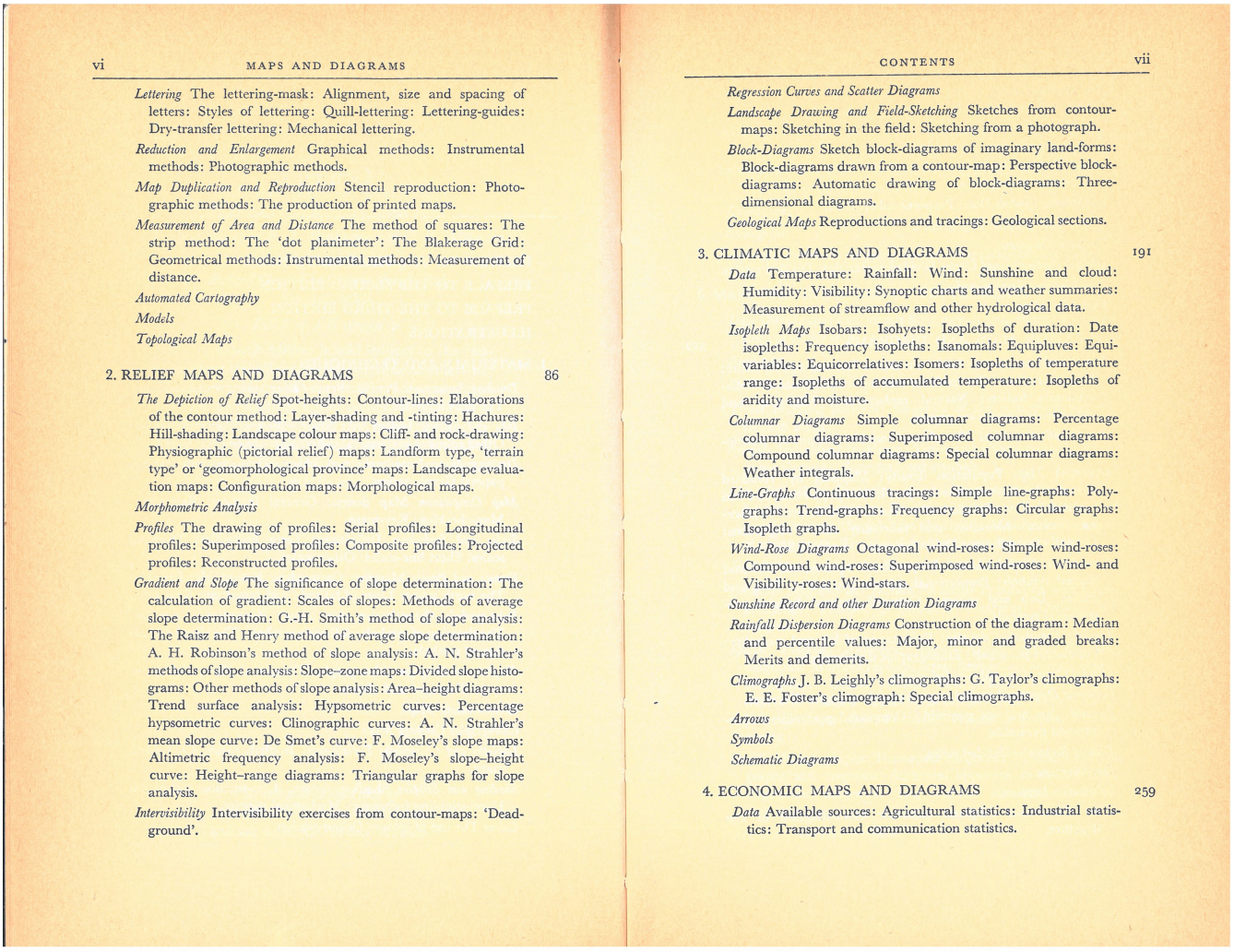
Traditional accounts of the history of mapping took the form of family histories, which were so historic that they also charted the evolution of the various things that were collectively referred to as maps.[4] The RGS librarian and map curator G R Crone's (1953) *Maps and their Makers* set out major chronological stages in the map's evolution (for instance, classical, medieval, age of discoveries, Mercator, French and British surveys, and contemporary cartography). Bagrow's (1964) *History of Cartography* augmented these phases with chapters on maps of 'primitive peoples', Islamic Cartography, the mapping of America, and the cartography 'of Asian peoples'. This particular type of genealogical history was traditionally supported by the institutional gatekeepers of the field (antiquarians, dealers, librarians, explorers, and academics; Barber, 2020). The product was a culture of prized facsimile map productions, euro- and science-centrism, and of map-maker hero worship. The latter was especially apparent in Wilford's (2000) *The Mapmakers*, first published in 1981. The map as idea and object was tracked, in fascinating detail, through many of the phases outlined above, but always with an emphasis on the map-maker, taking in Eratosthenes, Ptolemy, Columbus, Mercator, Cassini, Harrison, Cook, Vancouver, Lambton, Everest, Mason and Dixon, and Preuss.

The vast University of Chicago *History of Cartography* volumes were chronological in sequence, but the preface to the first volume made it clear that their definition of a map had exceeded that of Bagrow: 'Maps are graphic representations that facilitate a spatial understanding of things, concepts, conditions, processes, or events in the human world' (Harley & Woodward, 1987, p. xvi). This expanded definition has led to new emphases in the chronologies of map history, such as critical histories of 'discovery', cartometrics and studies of geodetic accuracy, and the history of maps as physical artefacts (Delano-Smith et al., 2020).

The critical turn in cartography also raised questions about how to write its history. The genealogies above had tended to distinguish products of the West (maps) and non-West (map-like items) and of men and women (Edney, 2017, p. 68). Where did non-visual maps fit into this story, or non-durable ones? What about how maps are used? These questions have arisen from a series of conflicts and pitched battles within the history of cartography, in which maps have not been treated as dusty relics or their interpretation that of hallowed iconography. Meek, mild, as if!

3 | GENEALOGY II: CARTOGRAPHIC DISJUNCTURES

The second sense of genealogy used here has been widely adapted from the work of Michel Foucault (1977), who proposed it as an alternative to the study of *longue durée* histories and ancient, naturalised continuities. Instead, Foucault looked to ruptures and emergences in forms of understanding and practice. In the cases below, the similarities between



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Map Duplication and Reproduction Stencil reproduction: Photographic methods: The production of printed maps.

Measurement of Area and Distance The method of squares: The strip method: The 'dot planimeter': The Blakerage Grid: Geometrical methods: Instrumental methods: Measurement of distance.

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Morphometric Analysis

Profiles The drawing of profiles: Serial profiles: Longitudinal profiles: Superimposed profiles: Composite profiles: Projected profiles: Reconstructed profiles.

Gradient and Slope The significance of slope determination: The calculation of gradient: Scales of slopes: Methods of average slope determination: G.-H. Smith's method of slope analysis: The Raisz and Henry method of average slope determination: A. H. Robinson's method of slope analysis: A. N. Strahler's methods of slope analysis: Slope–zone maps: Divided slope histograms: Other methods of slope analysis: Area–height diagrams: Trend surface analysis: Hypsometric curves: Percentage hypsometric curves: Clinographic curves: A. N. Strahler's mean slope curve: De Smet's curve: F. Moseley's slope maps: Altimetric frequency analysis: F. Moseley's slope–height curve: Height–range diagrams: Triangular graphs for slope analysis.

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Columnar Diagrams Simple columnar diagrams: Percentage columnar diagrams: Superimposed columnar diagrams: Compound columnar diagrams: Special columnar diagrams: Weather integrals.

Line-Graphs Continuous tracings: Simple line-graphs: Polygraphs: Trend-graphs: Frequency graphs: Circular graphs: Isopleth graphs.

Wind-Rose Diagrams Octagonal wind-roses: Simple wind-roses: Compound wind-roses: Superimposed wind-roses: Wind- and Visibility-roses: Wind-stars.

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Rainfall Dispersion Diagrams Construction of the diagram: Median and percentile values: Major, minor and graded breaks: Merits and demerits.

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FIGURE 3 Cartographic Hieroglyphs. From *Maps and Diagrams*, Third Edition, by FJ Monkhouse and HR Wilkinson, Copyright (© 1971) by Methuen. Reproduced by permission of Taylor & Francis.

genealogies I and II are apparent, as generations of scholars turned on their forefathers (these are all men) in attempts to move from an emphasis on the map to the process of mapping, map-reading, and map-using. Unlike cultural geography in the 1980s–1990s, there was not a major feminist disjuncture in cartographic analysis, although women continued to be key contributors to map creation, interpretation, and analysis (Tyner, 2019). The prevalence of female authors in the third genealogy section below, and the papers in this collection, attest the slower but significant changes in the field (see Kelly, 2023). More rapid changes were prompted by manifestations of the perennial phenomenon of 'cartographic anxiety' (Barrett, 2020; Krishna, 1994), whether about the state-based or military origins of mapping, of its complicity with developmental or improvement programmes, or its representational insufficiencies.

If Crone and Bagrow represent classics in the post-war history of cartography, we might turn to Monkhouse and Wilkinson (1971) *Maps and Diagrams* to see how cartography was taught in the same period. First published in 1952, the third edition of 1971 featured chapters introducing students to the materials and techniques they would require to produce compositions of relief, climatic, economic, population, and settlements maps and diagrams. Both the maps and their instructions may, as Harley feared, read as hieroglyphs to the contemporary geographer (see Figure 3), just as ArcGIS would have been to Monkhouse and Wilkinson. The former had been a teacher until the Second World War, when he joined the Intelligence Division of the Naval Staff. His experience in the production of Admiralty Handbooks enhanced his interest in cartography, which he pursued in his later academic career. His obituary in *Geography*, by his former co-author, noted that 'He was uncompromising in his views of the subject and had little time for theory in geography or for new developments, unless they were seen to bear fruit in a regional context' (Wilkinson, 1975, p. 227).

Within 10 years of the first edition, however, Darby (1962) had already voiced concerns about the capacity of maps for such geographical description. He spoke of the humiliations of trying to adequately describe even a small tract of countryside, and the necessary subjectiveness of this description. Historical layering and situatedness might add explanatory value to these descriptions and maps, as Darby's (1953) broader work reading the 'horizontal' landscapes of the past along 'vertical' sequences of change demonstrated.

Harley later returned to Darby's concerns about the subjectivity of maps. How was it that Darby had continued with his 40-year-long *Domesday Geography* project, 'a narrative written as much in maps as texts' (Harley, 1989, p. 81), if he doubted the objectivity of the very maps on which the project was based? Harley expanded this concern into an agenda-setting call to treat all maps as texts in need of critical examination. This was a concern as much regarding the contemporary explosion of computer-produced large-data maps as for historical cartography: how was the world being newly represented? This was, in part, a product of the de-skilling of geographers in the art of map-making, distancing them from the production processes involved (Darby himself, it was noted, employed a map-maker, thus avoiding confrontation with the 'cartographic illusion'):

> It is as if an army of ghost writers had written a large part of our texts for us. We have failed to question the inner logic, the rhetoric, and the style of the map in the same way as we would question the syntax of the written word. We have abrogated to the cartographers a part of our discourse, on the assumption that their standard techniques could somehow redescribe the past for us in more rigorous terms.
>
> (Harley, 1989, p. 83)

Rather than as mirrors of reality, Harley insisted we view maps as texts that create new realities, ones suffused with power relations and influence. Again, this was to equip geographers to face the future of mapping, not just its past: 'The data map has acquired an authority as a form of representation, a tool of science, which though criticised on points of detail, is seldom attacked on principle' (Harley, 1989, p. 84). The answer was not that we abandon maps, but that we make more types of map and ask more radical questions of them: are statistical representations useful? What would a new cartography be?

Harley became the lodestar of this new cartography. He combined an interpretative flair borrowed from French post-structuralists with a commitment to the utility and potential of maps. On both fronts he was quickly savaged, by fellow cartographers, for being both insufficiently post-structural and excessively empiricist. Belyea (1992) criticised Harley for failing to sufficiently engage with the complexities of the philosophical texts that he deployed. While he focused attention on the context for map production and use, and the exclusions from map production and those who suffered because of them, he failed to really question what exactly a map was. For Wood (1993), this philosophical reading was, itself, a product of Harley's 'sturdy British empiricism' that prevented him from comprehending the structures which produced maps, and which were inherent to post-structural analysis in general: 'That is, Harley didn't know what he was talking about' (Wood, 1993, p. 50).

Harley remained committed to producing a new cartography, regardless. But cartography itself has come under a remarkable attack, from within. Edney (2019), Osher Professor in the History of Cartography, and of Geography, at the University of Maine and current director of the History of Cartography at University of Wisconsin-Madison project, has claimed that the very concept of cartography is a cultural misdirection, an idealised behaviour, which obscures how people produce, circulate, and consume maps. That is to say, a distraction from the behaviour that is mapping. Edney goes for the heart of cartography: why should maps, charts, and plans have something in common? What *is* a map? The cartographic ideal answers that there is a transcultural endeavour of visualising the world using universal techniques. While the critique of Harley and others had highlighted the power function of maps, these critiques retained the ideal of cartography (Edney, 2019, p. 25). This cartography is difficult to dislodge from the family genealogies outlined above, here recast not as those of evolution but of supposed decline (the ideal being prefigured in the eighteenth century, emergent in the nineteenth, triumphant in the twentieth, and degraded in the twenty-first; Edney, 2019, p. 228). An alternative is a focus on mapping that includes non-graphical means of representation, that represents spatial complexity (whether graphic, textual, verbal, gestural, performative, or physical; Edney, 2019, p. 236).

These cartographic critiques have prompted much debate within and beyond geography, although the division between critical cartography and (often quantitative, large dataset based) map-making remains a stark one, with overlapping but largely separate debates and vocabularies. Within cartography itself there are also many who do not engage with the debates outlined above, and those who push back. Cheshire (2024a), for instance, has recently suggested that having deconstructed the map, it is time to reconstruct it. Acknowledging the value of Harley's intervention, Cheshire insists that map-makers are fully aware of the pitfalls of cartography but remain committed to a better (not perfect) representation of reality. These might be traditional maps, but also counter-maps, and campaigning maps. As Cheshire expands in his paper in this collection Cheshire (2024b), this may involve a fuller acquaintance with the vast range of mapping practices, historical and present, and a more widespread and innovative engagement with map-making.

3.1 | Defining mapping

Thus, mid-way through the paper, we get to definitions. They emerged from the histories, the historiographies, and the bust-ups outlined above. In short, the definitions chart the move from a noun to a verb.

The map is the noun, the thing. In 1938, Erwin Raisz offered this definition: 'A map is, in its primary conception, a conventionalised picture of the Earth's pattern as seen from above' (cited in Dodge et al., 2011c, p. xix). Via Harley and Woodward's definition (cited above), Dodge, Perkins, and Kitchin suggest that traditional definitions of a map depict it as a material artefact that visually represents the landscape from above, using cartographic norms and a consistent reduction in scale. But what does the interactive or live map do to this definition? Where do Indigenous, non-visual forms of mapping sit (Edney, 2017)? What about the why, the how, the when, and the who (Hessler, 2015)? As above, many now focus on the process not the product.

Mapping is the continuous verb, the action. For Dorling and Fairbairn, mapping can be a purely mental affair, which need not produce a map: mapping, for them, was 'a symbolised image of geographical reality' (Dorling & Fairbairn, 1997, p. 3). Cosgrove agreed with the processual and mental focus, but tethered *Mappings* to the contexts and contingencies 'which have helped shape acts of visualising, conceptualizing, recording, representing and creating spaces graphically – in short, acts of *mapping*' (Cosgrove, 1999, p. 1, original emphasis). Mappings can be scientific but also spiritual, political, or moral; they can be drawn or remembered. For Edney (2017, p. 71), 'Mapping is the process of representing spatial complexity'. For Kitchin and Dodge (2007), the required move is that from questions of the ontology of the map (what are they?) to the question of the ontogenesis of mapping (how are they formed?). In Duggan's (2024, p. 25) book, mapping is the emphasis but at the heart of his study is an interest in how maps get used and re-used in the ever-ongoing process of mapping. This echoes Dodge, Perkins, and Kitchin's (2011b, p. 220) manifesto call, asking how mapping might be done more productively, but also 'in ways that might be more efficient, democratic, sustainable, ethical or even more fun'.

4 | GENEALOGY III: UN-SUBJUGATED MAPPING

If one mark of a Foucauldian genealogy is its emphasis on ruptures and discontinuities, the other is the seeking out of subjugated and suppressed knowledges and practices, and their breaking free because of but also as the basis of critique

(Foucault, 1982–83 [2010]). Jeremy Crampton made precisely this point in his attempt to forge a dialogue between critical cartography and GIS studies. Beneath dominant voices and practices in the history of cartography have always lain counter-conducts and dissenting voices that were once subjugated but are now making themselves felt (Crampton, 2010, pp. 4, 13–24). Criticism, indeed, has been part of mapping throughout, whether the testing of conflicting reality claims in the production of a map, or in philosophical debates regarding the god-trick of cartographic objectivity (Wood et al., 2020). The account above has been dominated by white men (their maps, and those who have analysed them). The forms of critique and cartography below (and the papers in this special collection) present a more diverse range of mapping practices and dialogues, many of which were contemporary to the debates and events above, but not central to those narratives. In this final section, I briefly direct the reader to some indicative examples of previously marginal forms of mapping that are now essential to the field.

4.1 | Critical quantitative mapping

Crampton (2010) argued that most human geography textbooks had ceased including substantial sections on mapping, cartography, or GIS, while cartographers and GIS practitioners had little to say on power, politics, discourse, postcolonialism, or resistance. Crampton insisted the two fields could and should be brought into dialogue. This paper is as guilty as others in privileging critical histories of cartography over critical engagements with ongoing cartographic practice and the transformative effects of computer analysis and large-data processing on map production. This is a relatively recent breach, however, as the *Progress in Human Geography* cartography reviews made clear, covering in detail the rise of mathematical modelling in mapping in the early 1970s; the role of maps in conveying spatial relationships, and the rise of computer-aided mapping and early GIS, in the 1980s; the rising dominance of GIS and the lack of critical engagement with its shortcomings, and the emergence of online mapping and GIS-enabled decision making in the 1990s; and rich engagements with the technical challenges and opportunities of quantitative mapping in the 2000s (Kitchin, 2014). The breach Crampton identified has not yet, it is felt, been bridged: 'viewing maps as contingent processes has not led to a resolution of the tension between the critique of cartography on the whole and the practice of mapmaking itself' (Wood et al., 2020, p. 28).

There are, however, practitioners and fields that bridge critical human geography and quantitative cartography where these dialogues are taking place. One of these is medical geography, where the mapping of large datasets concerning health metrics (morbidity, mortality, life expectancy, or vaccination rates) is one of the cornerstones of the subdiscipline. At its heart lies one fabled London map, that of Dr John Snow's 1854 mapping of cholera rates in Soho, homing in on the infamous water pump on Broad Street (students can produce their very own map using Snow's dataset in ArcGIS).[5] Medical geography is one of the few geographical subdisciplines that still regularly produces atlases (Smallman-Raynor & Cliff, 2012), especially of historical data.

John Hessler's (2024) paper in this special collection shows how geographers contributed to the very real and contemporary challenge of mapping and containing COVID-19. As a specialist in computational geography and GIS at Washington DC's Library of Congress at the time, Hessler advised the government on policy in the face of an unprecedented medical crisis and geospatial analysis challenge. Among the many unanticipated consequences of the pandemic was a rapid rise in carto-literacy, as we struggled to understand the scales and spaces through which the disease spread; between continents, countries, cities, and neighbourhoods, as mapped in online dashboards. This public-facing information was just one face of the mapping challenge, which also sought to map and explain the origins and evolution of the virus and is sub-strains.

A second field with rich potential for bridging critical cartography and GIS methods is the digital mapping of urban geographies. This field has emerged at the confluence of several developments:[6] the emergence and development of open data and software, and the uses to which it has been put (Seibel, 2023); the investigation of user engagements with maps and their information in, for instance, choosing cycle routes (Brügger et al., 2017); the increasing sophistication of digital geographical analysis of both urban problems and the inclusion or exclusion of urban communities from the digital commons;[7] the rise of novel virtual environments and new approaches to representation and analysis of geovisualisations (Robinson et al., 2023); and the critical consideration of the rolling out of digital cartography in urban frontiers of cities in the Global South (Datta & Ahmed, 2020; Jonnalagadda & Cowan, 2024). The latter work, especially, draws attention to the role of digital technologies in surveying and enclosing common resources and spaces. For others, however, new forms of mapping present ways to cure the ills of cities across the world.

In their paper, Rob Kitchin and Oliver Dawkins (2024) explore the role that 'digital twins and deep maps' are having on cartography, geography, and the cities they manage (also see Dodge, 2018). Maps here are living, live, and responsive to the physical and social cities of which they are twins, producing rich new intertwinings of maps and territories. Their work on Dublin combines cutting-edge technological mapping of near-real-time developments in the city with more traditional cartographic representations and 3D projections. These models offer up the potential utopic enhancement of urban life for its citizens (better traffic flow, better utility provision) but also risk a dystopic surveillance state with Big Brother as digital twin.

4.2 | Empire, race, and indigenous mapping

> 'the truth is that the Great Mogol might very well bring his action against Mercator and others', Terry claimed, because they 'describe the world, but streighten him very much in their Maps, not allowing him to be Lord and Commander of those Provinces which properly belong unto him'.
>
> (Das, 2023, p. 295)

The above description is quoted in Nandini Das's account of the East India Company's first ambassador to India, Sir Thomas Roe's, attempt to win the favour of Jahangir, the Mughal Emperor, in 1617. Caught out by a surprise visit by Jahangir, and knowing he greatly enjoyed maps, Roe presented Jahangir with his own bound volume of Mercator's maps of the world. It was returned a couple of weeks later, under the pretence that the emperor's courtiers could not read them. Roe's Chaplain, Edward Terry, however, was convinced (as above) that the return was a rejection of Mercator's maps, which diminished the extent of the Mughal Empire's territories. In Mughal portraits, India was at the centre of the globe, with Europe an almost invisible presence on the margins (Das, 2023; Ramaswamy, 2001).

Das reminds us that cartography has always been contested (Wood et al., 2020). But the dynamic of this contestation has often been unequal. The marshalling of cartography to the ends of empire was one of the main attack points of Harley's new cartography, the prime exemplar of how great powers both used maps and suffused them with their knowledge formations (Akerman, 2009; Padrón, 2004). Geographers responded to such points, and the broader postcolonial turn, to explore how the discipline and its institutions (in the British context, foremost the RGS) produced maps that facilitated and perpetuated imperialism (Biltcliffe, 2005; Driver, 1999; Edney, 1997; Jagessar, 2023).

In her paper, Katherine Parker (2024) details some of her experiences as Cartographic Collections Manager for the RGS-IBG. For her, maps are sources of knowledge and records of the past, but also material artefacts that allow teaching and reinterpretation (just as they always have been in geography classrooms). She talks about how the Society has been negotiating the imperial legacies of its map collection, while also using them to initiative dialogues on recent geopolitical crises, like the Russian invasion of Ukraine. She also describes how the map collections are rich sites for negotiating diasporic memory and histories, as Chandal Mahal's doctoral work on the Punjab attests.[8]

Maps also formed part of the long, slow, and ongoing process of internationalisation and formal decolonisation (Akerman, 2017; Pearson & Heffernan, 2015; Ramaswamy, 2010).[9] Two papers below consider how maps might also contribute to the project of decolonising geographical knowledge and spaces. Gavin Grindon and Duncan Hay (2024) reflect on their previous work in curation, public art, and advanced spatial analysis, and how this was brought to bear on their 'British Monuments Related to Slavery' project with Jennie Williams. For them this marked a novel engagement with large-scale datasets that were used to map connections between commemorative sites in the UK, the locations of slavery in the West Indies, and the USA (for an alternative exploration of similar questions, see Unangst, 2023). This data also gives fascinating insights into the location of such monuments within the UK (mostly churches) and their periods of construction. If this paper marks the engagement of non-geographers in a piece of public mapping, the following is an exploration of a geographer's refusal of the urge to 'map', while exploring the potential for creative and racial counter-cartographies.

Camilla Hawthorne's (2024) contribution opens with her scepticism about maps, because of their appropriations, their distortions, and their abuses. This is apparent in the context of racialised histories and geographies in the USA, but also in contemporary Italy where race-based data is inaccurate, yet Black populations are hyper-surveilled. Such cartographic anxiety emerges from Black geographies scholarship that is both aware of the use of traditional cartography to fix and exploit Black communities, and also conscious of the creative capacities that new forms of mapping present (Alderman et al., 2021; Alderman & Inwood, 2023; Bottone, 2020). Both of these papers hint at the art–cartography

interface, explored in the next section below. But this is an interface that has also been explored by the vast and influential body of work on Indigenous mapping.

The awareness of Indigenous maps is not new in the history of cartography. But, as in the case of Bagrow outlined above, where considered at all, this mapping was often framed as 'primitive'. That is, it was thought to be local while imperial cartography was universal (Edney, 2017). Work on Indigenous mapping aims to remove such maps from the margins or peripheries of cartography and put them at the centre of studies of world-making. This was the ambition of a collection put together by Reuben Rose-Redwood, Natchee Blu Barnd, Annita Hetoevėhotohke'e Lucchesi, Sharon Dias and Wil Patrick (2020). Drawing on a broad body of existing scholarship, the authors aimed to go beyond anticolonial mapping (with its focus on resisting colonialism) to:

> reclaim place-based, ancestral, Indigenous knowledge while also enacting the contemporary world-making practices of Indigenous and colonized peoples in the present. Anticolonial and decolonial spatial practices are often intertwined, yet the former paradoxically has the effect of re-centering the 'colonial' (as a target of resistance) whereas the latter de-centers colonialism as the primary pivot around which ways of knowing and being-in-the-world are conceived, imagined, and lived.
>
> (Rose-Redwood et al., 2020, p. 152)

Anti- and de-colonial Indigenous mapping has been hugely influential since the emergence of mapping projects in Canada and Alaska in the 1950–1960s (Anthias, 2023). Map biographies, charting the subsistence patterns of communities through time, were used to make claims regarding land use and occupancy, which were adapted in the 1990s to take advantage of developments in GIS and GPS technologies. These mapping technologies continue to be experimented with, as in the atlas of Pan Inuit Trails.[10] Colonial archives also continue to be explored for subaltern traces of Indigenous mapping techniques and claims on land (Martin, 2022; Slappnig, 2021). This does, however, raise questions about naturalising state claims on territory and negating alternative territorialities. Such questions make space for Indigenous ontologies of place that predate colonial cartographies. These maps can be visual, or transmitted through song or through movement. They can also be captured through alternative technologies to the graphic map, using audio-visual media or open-source maps (Anthias, 2023).

4.3 | Counter-mapping

As once-subjugated forms of cartography, all the forms of mapping in this section are critical. Some of these critiques have now become commonplace, such as the acceptance of the saturation of the maps of exploration in the power relations of imperialism. Other forms of mapping forcefully insist on their ongoing otherness. Some adopt the traditional forms of the map but turn them against the agents of sovereign power (states, corporations, governments), others subvert the cartographic traditions of the map to present new forms of knowing and to express alternative forms of spatial understanding (Mason-Deese, 2020). As shown above, Indigenous mapping pioneered both forms, making land claims using traditional map forms, while also experimenting with new maps of visualising relationships between space, movement, and tradition (van Houtum, 2024). Many experimental counter-maps have also emerged from community activism and artistic collaboration (see the following section), social movements, and political campaigns. These have included the mapping of protests and their alternative spaces, whether relating to ecological campaigns, disability or gender discrimination protests, or anti-austerity/military movements (Perkins, 2017). If Perkins (2004) could complain that critical cartography was too wordy, leaving the map-making to others, the last 20 years has seen an explosion of counter-mapping work, much of it explicitly political.

The latter can align itself explicitly with critical and radical traditions in geography and beyond, while claiming and remaking traditional forms like the map and the atlas. As Alexi Bhagat and Lize Mogel argued in the introduction to their collection of 10 maps: 'We define radical cartography as the practice of mapmaking that subverts conventional notions in order to actively promote social change. The object of critique in *An Atlas of Radical Cartography* is not cartography per se (as is generally meant by the overlapping term critical cartography), but rather social relations' (Bhagat & Mogel, 2007, pp. 6–7). The maps collated in their atlas range from the recognisably cartographic, such as Jai Singh's plans from the 1980s attempting to preserve a community at risk in India by mapping it, to more abstract maps (superimposing the Panama Canal and the Northwest Passage onto San Francisco Bay, forging associative geographies that anticipated Verrall's *Atlas*; also see Rekacewicz, 2021).

Such forms of mapping respond to changing cartographic techniques but also to political circumstances that have changed, or have not. Mapping has played a fundamental role in the historical geographies of Israel–Palestine (Falah, 2021; Schnell & Leuenberger, 2014) and the recent war in Gaza, following the Hamas attacks of October 2023, has forced a reckoning regarding how geographers (Agha et al., 2024) and geographical institutions like the RGS-IBG (Griffiths et al., 2024) should respond. Forms of mapping will continue to play a role in these conversations, as represented in two of the papers that follow.

Hashem Abushama (2024) builds on his existing work, which has interweaved counter-maps of Palestine, memoir, ethnography photography, and critical analysis with memories of growing up in al 'Arub refugee camp, histories of family dispossession, and narratives of return.[11] In his paper, Abushama explores how counter-maps by the artist and architect Haya Zaatry chart the fragmenting of historic Palestine into archipelagos of territories and possessions, which can be read contrapuntally, such as the cities of Haifa and Ramallah. Here artistic mappings are read alongside photographs, historical documents, and poems to forge new geographical perspectives and interventions. This work chimes with Annelys De Vet's long-term project of producing *Subjective Atlases*, which are bottom-up collaborative exercises in the production of geographical knowledge. In her paper, De Vet (2024) outlines in detail how her 2007 *Subjective Atlas of Palestine* was created, and how the atlases struggled to find their way to Palestine and have been used within and beyond the region.

While the *Subjective Atlases* are one form of collective counter-mapping, there is a broader and longer tradition of collective cartography, taking in community mapping from the 1960s (including Indigenous mapping but also local forms of mobilisation against local governments; Caquard, 2014). Collaborative mapping has been supercharged by Web 2.0 mapping technologies, the use of volunteered geographic information (VGI), and campaigns against involunteered geographic information (iVGI), and the global sharing of techniques, apps, and cartographic conventions against rural or urban dispossession.

In his paper Gautam Bhan (2024) draws on a series of collaborations with communities and organisations in New Delhi to look at the roles mapping can play in negotiating the challenges of Global South urbanism. The visibility produced through appearing on a map can bring infrastructure investment, but it can also bring eviction or enclosure. The revaluation of informal labour is decreasing this risk for some, and increasing critical awareness among Delhi dwellers of *how* they are mapped and the need to collaboratively create the maps that Bhan discusses.

One of many hubs for sharing other community counter-mapping techniques 'for social change, public engagement, critical debate and creative forms of community campaigning' is the livingmaps network.[12] Alongside a vast range of counter-mapping projects and events, an online journal includes regular pieces of short fiction, poetry, autobiography, annotated performances, and photography. It is with this blurring of the artistic and the cartographic, the representational and the non−/more-than representational with which we conclude.

4.4 | Representational and more-than-representational mapping

Herman Melville's hallucinogenic, epic novel recounts Captain Ahab's maniacal hunting of the albino sperm whale, *Moby-Dick*. When the novel surfaces in cartographic literature, it is usually through the suggestion that 'native' Queequeg's island was not 'down on any map; true places never are' (Melville, 1851 [2012], p. 66). But in chapter 44, 'The Chart', Melville recounts Ahab's immediate turn to mapping after having witnessed the whale (for retrospective mapping of whale killings, see Cheshire & Uberti, 2021, pp. 46–49). Referring to old logbooks, Ahab ('our old Mogul', Melville, 1851 [2012], p. 230) traced a pencil over the blanks of the chart:

> While thus employed, the heavy pewter lamp suspended in chains over his head, continually rocked with the motion of the ship, and for ever threw shifting gleams and shadows of lines upon his wrinkled brow, till it almost seemed that while he himself was marking out lines and courses on the wrinkled charts, some invisible pencil was also tracing lines and courses upon the deeply marked chart of his forehead.
>
> But it was not this night in particular that, in the solitude of his cabin, Ahab thus pondered over his charts. Almost every night they were brought out; almost every night some pencil marks were effaced, and others were substituted. For with the charts of all four oceans before him, Ahab was threading a maze of currents and eddies, with a view to the more certain accomplishment of that monomaniac thought of his soul.
>
> (Melville, 1851 [2012], p. 231)

Melville shows how art and cartography can fantastically intersect, just as the examples of counter-mapping above showed how art, politics, and cartography could be mutually constitutive. In their foreword to the 'counter/cartographies' special issue with which this paper opened, Schoenfelder (2023, p. ii) claimed that 'Any act of map-making (conceptual, physical, material, or visual) is about relations of power and to counter-map is to redistribute or reclaim power. It's a practice that considers power at different scales, as it appears in different modes, represented in different places, as it occurs at different times, and perceived through different ways of knowing'. Many of the pieces they brought together were explicitly political and incorporated traditional maps. Others included no cartography as traditionally conceived, threading together images, photographs, artwork, and spatial visualisation. As such, these counter-cartographies sit in a longer tradition of artistic engagements with mapping (Novaes, 2015) but also within more recent geohumanities experiments with 'deep mapping' (Dodge, 2017) which attempt to evoke the richness of small places (landscapes) and their emotional geographies (which puts us in mind of the humiliations felt by Darby, 1962).

Georgina Endfield and Jacky Waldock's (2024) contribution reflects on a unique cartographic exercise they undertook in the wake of the outbreak of COVID-19. Working with the RGS-IBG's school networks, a nationwide call was sent out to children aged 7 to 16 to map the changing nature of home spaces during and around the UK's lockdown. As a result, 350 maps were received, which reflected the feelings and contexts that extended beyond the children's dwellings to the communities, landscapes, and spaces of special meaning experienced during the curtailed mobility of lockdown. The maps submitted most often resemble sketches and art works, but were foundationally built on a spatial vocabulary and understanding of radically grounded worlds. These artistic mappings represented both the non-representable (the repetitive, traumatic, enervating experience of childhood lockdown; the presence and likely experience of the morbidity or mortality of a loved one) and the more-than-representational (mobility and immobility; the affective atmosphere of lockdown; the physical and mental changes that bodies underwent in those stultifying months). Likewise, Melville's account of Ahab charting Moby-Dick blurred the visual and the textual, the stationary and the mobile, the body as mapper and the body as mapped, the endless process of updating a liquid map, and the passionate obsessions which map-making could induce.

Maps can bridge the non-/more-than/representational in several ways (as reflected in many of the papers that follow, as indicated). One way is through narrative, which can be mapped from representations like novels, but which can also narrate how maps are made and used in the world (Caquard & Cartwright, 2014; see Endfield & Waldock, 2024). Another is through tracing how people comprehend and interpret maps, whether printed or online, whether for the settled or the displaced (Caquard, 2015; see de Vet, 2024). We can also think about how maps are performed and achieve performative authority when used or brandished (Crampton, 2009; see Hessler, 2024). At its most fundamental, this can return us to the age-old question (what is a map?), only to displace the map, finally, with process alone: moving from ontology to ontogenetics (see Kitchin & Dawkins, 2024). Gerlach (2017, p. 96) suggests that this shift to an emphasis on emergent encounters through which maps are engaged by map users is one of the three ways in which non-/more-than representational theory and cartography have productively entered dialogue (see Bhan, 2024). The second is through a focus on the non-human; the materials, devices, papers, and screens through which maps are constituted (see Parker, 2024). The third is through exploring participants who engage in creative map practice, assembling new actors and (geo)political contexts in the process (see Abushama, 2024; Hawthorne, 2024).

These intersections between the papers below and the challenges of representational theories demonstrate their richness, as does the alternative narratives within which they have been situated above. They appear in this Themed Intervention in pairings (following Hessler, 2015), which each bring together geographers' and non-geographers' different forms of mapping to help us understand: geography (ways in which we can engage and create public geographies of understanding, and the ways in which publics can help us make our maps); abolition (how we can map the ongoing legacies of slavery, abolition, and the racial configuration of contemporary geographies); counter-cartographies (the potential of mapping for holding violence to account and facilitating the creation of alternative geographies); and COVID-19 (mapping the virus and the geographies that it created).

The hope is that these papers, and the conference plenary conversations which they anticipate, will provoke ongoing discussion within and beyond Geography over the contribution that this broad range of cartographic techniques might offer, and how these contributions might help us reflect on the past, present, and future relationship of mapping to Geography.

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ENDNOTES

[1] https://sites.google.com/view/edenkinkaid/creative-works/countercartographies, last accessed 5 April 2024.

[2] https://www.theguardian.com/travel/2023/oct/31/metro-memory-and-tim-marshall-put-cartography-back-on-the-map, last accessed 2 April 2024.

[3] The six volumes of the University of Chicago's *History of Cartography* are free to download at https://press.uchicago.edu/books/HOC/index.html, last accessed 5 April 2024.

[4] I am indebted to André Novaes, personal communication, for this point.

[5] https://learn.arcgis.com/en/projects/map-a-historic-cholera-outbreak/, last accessed 4 April 2024.

[6] Thank you to Stef Sabbata for his advice here.

[7] See the work of Information Geographies at https://geography.oii.ox.ac.uk/about/, last accessed 4 April 2024.

[8] Also see Rohini Rai's recent work with UK-based Himalayan diaspora communities from Nepal and Northeast India: https://www.rgs.org/about-us/our-work/latest-news/british-academy-funding-for-public-engagement-project-on-our-collections, last accessed 9 April 2024.

[9] See the 'Race and the League of Nations' online exhibition by Jake Hodder at https://www.nottingham.ac.uk/research/groups/race-and-the-league-of-nations/index.aspx, last accessed 5 April 2024.

[10] http://www.paninuittrails.org/index.html?module=module.paninuittrails, last accessed 5 April 2024.

[11] Hashem Abushama 'A map without guarantees: Stuart Hall and Palestinian geographies', available at https://www.stuarthallfoundation.org/awards/inaugural-stuart-hall-essay-prize-awarded-to-hashem-abushama/, last accessed 5 April 2024.

[12] https://www.livingmaps.org/, last accessed 5 April 2024.

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