ARCHAEOLOGY International

UCLPRESS

Archaeology International

Research Articles and Updates

North isn't necessarily up: map projections, the politics of cartography and their relevance to archaeology

Panos Kratimenos[1,*]

How to cite: Kratimenos, P. 'North isn't necessarily up: map projections, the politics of cartography and their relevance to archaeology'. *Archaeology International*, 2022, 25 (1), pp. 78–88 • DOI: https://doi.org/10.14324/111.444.ai.2022.06

Published: 30 December 2022

Peer review:

This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.

Copyright:

Open access:

Archaeology International is a peer-reviewed open-access journal.

*Correspondence: p.kratimenos@ucl.ac.uk
[1]UCL Institute of Archaeology, UK

North isn't necessarily up: map projections, the politics of cartography and their relevance to archaeology

Panos Kratimenos

Abstract

Maps and mapping are indispensable tools within archaeological practice. However, they are also tools that have historically been employed relatively uncritically by archaeologists. Maps are used functionally, with little attention paid to the subtler impact of certain decisions in relation to form and appearance. This article serves as a companion to 'A global perspective on the past: the Institute of Archaeology around the world' piece earlier in this volume, briefly explaining the theoretical principles underpinning decisions taken in that piece. In particular, the relevance of developments in the field of critical cartography and their application to large-scale archaeological mapping are considered. Map projections, their history, relevant uses and the impact of the choice of projection are discussed, as well as the significance of map orientation. In particular, it is demonstrated that the normalised 'north up' visualisation of our planet is a very specific and surprisingly recent development with an important history and subconscious implications. The way in which space is visualised has a subtle impact on the way we understand and, therefore, behave in the world

around us. As such, it is contended that a self-conscious and reflexive attitude to the way we visualise space is a crucial consideration in our understanding of both the present and the archaeological past.

Keywords: archaeological theory, critical cartography, history of archaeology, imperialism and colonialism, maps and mapping

Introduction

Maps are deceptively serious business. Their importance for geolocation or navigation, for instance, is well known. What is often less appreciated is how the way in which we view the world can impact upon our attitudes towards it. In archaeology, maps tend to be regarded as fairly functional tools or, for some of us, equally as aesthetic and ornamental items. Unfortunately, however, given the discipline's reliance on maps and mapping, our engagement with cartography as a discrete academic discipline has been relatively scant. Particularly relevant here are developments in critical cartography since the late 1980s – especially the work of cartographers such as J. Brian Harley (1989, 1990, for example) who, through their research, 'destabilized the distinction between propaganda maps and scientific maps' (Herb 2017, 427). That is to say, they highlighted the inherent subjectivity and political nature of maps. This relative silence with regard to one of the essential tools of our discipline and practice is a central theme picked up on by Gillings, Hacıgüzeller and Lock (2018). However, this volume, focused as it is on archaeological theory and practice, is inevitably more concerned with the small-scale (features, sites or, at most, regions) at the expense of global maps.

In this article, the rationale behind the rendering of the world map seen in the 'Global perspective' feature of this issue of *Archaeology International* (p. 56) is outlined. I argue that theoretical developments in cartography over the last few decades are relevant to archaeological practice today – and that the lack of engagement with certain facets of critical cartography in particular may risk the unintentional

perpetuation of dated colonial and imperialist tropes subconsciously ingrained in archaeological cartographical practice.

Background

World maps have tended to be used by archaeologists in fairly limited, illustrative ways (for example, schematising postulated migrations of *Homo sapiens* out of Africa, depicting the independent emergence of writing or of domestication or demarcating the limits of a given group's reach). In these contexts, the focus is not so much on the world itself as it is on using a map of the world as a canvas to illustrate more specific trends. For these purposes – as well as, arguably, that of illustrating the distribution of ongoing research projects at the Institute of Archaeology across the world – a canvas might suffice; we need not dwell too much on the specifics beyond that.

Yet simply plotting points on a map feels insufficient. 'Borrowing' and repurposing from other disciplines is central to archaeological theorising (Lucas 2015) and, that being the case, it seems a shame that archaeology has not taken heed of theoretical innovations in cartography. In an admittedly niche way, this project presents an opportunity to address some of these developments and explore their potential utility to archaeology.

In deciding how to render the world map for this feature, there were two key considerations: that of the projection to be utilised and that of form. The justification for certain choices concerning both facets are outlined below, followed by brief consideration of the potential utility of advances in cartographic theory for archaeology.

Map projections

Fundamentally, distortions will always be present when rendering a sphere onto a plane. Thus a decision must inevitably be made between preserving *angles* or preserving *areas* depicted on a map, with purpose of use dictating the most appropriate projection (Usery 2017, 202–5).

Perhaps the most famous map projection – the Mercator Projection – is a cylindrical, conformal projection which prioritises the preservation of angles over areas. Conceived in 1569 by the Flemish cartographer Gerardus Mercator, this projection was designed for the purpose of navigation (hence the decision to prioritise the preservation of angles – meaning that any straight line on the map is a line of true bearing, enabling navigators to plot straight-line courses; Snyder 1993; Monmonier 2004). However, the trade-off here – accuracy of angles at the expense of areas and the distortions which this entails – makes the Mercator Projection inappropriate for other purposes, for instance here, where the focus is on the global distribution of ongoing projects. In particular, the Mercator Projection greatly overemphasises the relative size of higher latitudes. This means, for example, that Greenland (*c.* 2,166,000 km^2; *c.* 56,500 population) is rendered as approximately the same size as the entire continent of Africa (*c.* 30,370,000 km^2; *c.* 1.41 billion population).

The Mercator Projection is still arguably the most common map projection used. This is largely thanks to its historical popularity in world maps aimed at the general public (Abee 2021) and, more recently, to its use by Google Maps in the form of the modified Web Mercator Projection (see Battersby et al. 2014 for discussion), with all the power and authority intrinsic in that in the modern world. In the case of online maps, Web Mercator is an understandable choice, primarily focused as it is on navigation. However, given its inappropriateness for the task at hand, the Mercator Projection has never been used in this feature, with past editors preferring Cahill's Octahedral Butterfly Map or the Mollweide Projection.

The Mollweide Projection is a pseudo-cylindrical, equal area projection developed by Carl Mollweide in 1805 (Usery 2017). As an equal area projection, the Mollweide – in contrast to the Mercator Projection – preserves *areas* over angles. This, of course, makes the Mollweide inappropriate for navigation, but provides instead a more realistic rendering of the relative size of landmasses, reducing the overemphasis of extremes of latitude. As such, the Mollweide has generally been favoured for instances such as mapping geographic distribution (Snyder 1993). In this edition of the 'Global perspective' feature, the Mollweide Projection is maintained, but with one key difference: orientation.

On the form of world maps; or why there is nothing to say 'north is up'

Perhaps surprisingly, given its normalisation in most of our minds, the endemic orientation of maps being 'north up' is a relatively recent phenomenon. It seemingly became standardised from the sixteenth century onwards with the rise of mercantilism, globalisation and the widespread adoption in Europe of the compass for navigation (and, indeed, the Mercator Projection). Prior to this there was far less standardisation, however, with many maps oriented 'east up' or 'south up' instead (Ashworth 2019; Brotton 2014). Perhaps the most famous example of a non-'north up' map is Muhammad al-Idrisi's نزهة المشتاق في اختراق الآفاق (*Nuzhat al-mushtāq fī ikhtirāq al-āfāq* – 'The Excursion of One Eager to Penetrate the Horizons'. This map is known in the English- [or, more specifically, Latin-derivative-] speaking world as the *Tabula Rogeriana*), although many other examples exist across the world. To be sure, 'north up' maps did exist before this time – a particularly famous example is Claudius Ptolemy's world map of the second century CE – but they are comparatively less common.

A notable exception to this ostensible bias in orientation away from the north was Imperial China. Although south is considered to have been the primary cardinal direction in Chinese cosmology (Wang 2000), maps were not always rendered 'south up'. Although there is little standardisation in orientation in the earliest Chinese maps (Yee 1994), in many later cases maps were rendered 'north up'. In part, the north–south axis of Chinese map orientation may owe something to the earlier adoption of the compass than in Europe, although it should be noted that Chinese compasses were still calibrated with south as the chief cardinal direction (Needham 1959). However, the existence of 'north up' maps is supposedly due to political conceptions of cosmology at the time. The emperor dwelt in the north, facing south (Wang 2000); naturally he should feature at the top of the map, looking down upon his dominion and with his subjects looking up at him (Brotton 2014). This exception, incidentally, provides both a handy example of the politicisation inherent in cartographic practice (a key consideration of Critical Cartography) and an opening to consider the psychological aspect of map viewing through the prism of orientational metaphors.

The rationale underpinning this analysis of the 'north up' orientation in early Imperial Chinese maps is, of course, a very specific example. However, it is also relevant to how we today perceive the world through maps. George Lakoff and Mark Johnson (1980) propose the connection between emotions and spatial metaphors (specifically here, up equals good; down equals bad) in our perception, as revealed through everyday speech (for example, 'feeling on top of the world' as opposed to 'hitting rock bottom'). *Metaphors We Live By* remains controversial, but the notion of a connection between emotions and spatial metaphors maintains tentative support in psycholinguistic research (see, for example, Crawford et al. 2006; Meier and Robinson 2004; Meier et al. 2011; Nelson and Simmons 2009).

The time-depth of the orientational metaphor of 'up equals good; down equals bad' is unknown (and probably unknow*able*); for our present purposes, however, it is also incidental. What matters here is the social psychology of *the present*. Assuming that there is something to the notion that 'up equals good; down equals bad' has an impact on our subconscious perception, and taking into account the fact that most world maps are still centred on (or, technically, *very close to* [Malys et al. 2015]) the Greenwich Meridian, this suggests a potential problem at the root of the conventional world map orientation: one of marked Eurocentrism in how we perceive the world around us. Given the current ubiquity of the 'north up' orientation of maps ostensibly being linked to the Mercator Projection, its use, its proportionate overemphasis of landmasses in higher latitudes and the temporal context within which it emerged imbues this whiff of Eurocentrism with a distinctly colonial/imperial flavour.

This is all highly speculative, of course. But in the present moment of heightened awareness of the legacies of colonialism and imperialism within society at large – and perhaps even more acutely within academia itself – it presents an opportunity to experiment with alternatives. Indeed, the re-orientation of the world map away from 'north up' is one that has been employed in various contexts and for various purposes in recent years. One of the first instances in recent times of a 'south up' world map being utilised towards a political end is Stuart McArthur's 'Universal Corrective Map of the

World'. The author created this visualisation specifically to counter the 'disadvantaged' position of his native Australia in conventional renderings. More recently – and even more explicitly confronting the legacies of colonialism and imperialism – a 'south up' orientation has been utilised by UCL's Sarah Parker Remond Centre for the Study of Racism and Racialisation – and by the former World Cup-winning footballer (incidentally still the record holder for most caps for the French national football team) turned author and social activist, Lilian Thuram (2022).

Discussion: so far, so good … so what?

In this year's 'Global perspective' feature, the Mollweide Projection of the world map has been rotated 180°, thus rendering it 'south up'. However, the map remains centred on the prime meridian. While an argument could certainly be made for re-centring the map longitudinally – perhaps, for example, centred more in accordance with the most populous regions of the world – the 0° longitude centring has been preserved owing to the very simple consideration that this is a publication of the Institute of Archaeology, *London*. In terms of construction, the Natural Earth Quick Start Package was used for the base map in QGIS and overlaid with a Google Satellite layer to depict terrain and topography.

As such, the choice to rotate the map 180° is the most pertinent for discussion. In part this is in response to ongoing discussions concerning the legacies of colonialism, imperialism and racism across society (not least in the UCL-specific context, given the recent Inquiry into the History of Eugenics at UCL and, of course, such discussion's pertinence to archaeology as a discipline); in part it is simply experimental. Most of us have internalised a 'north up' rendering of the world in our spatial perception. As such, being confronted with an unfamiliar rendering of the planet is starkly disorienting; a sensation only heightened by the relative unfamiliarity of the proportions of landmasses rendered in the Mollweide Projection as opposed to the Mercator. However, aside from the potential discomfort and sense of

disorientation this 'inverted' rendering may induce, there is nothing 'wrong' with it per se.

As outlined above, the 'north up' orientation of our world is culturally and contextually specific – and indeed its ubiquity is a relatively novel phenomenon. Thus any normalisation of this perception may convincingly be argued to be simply one more 'invented tradition' (after Hobsbawm and Ranger 1983). This article has, I hope, illustrated that something that may at first glance appear as natural, benign and normal as the rendering of a world map can, with a little digging, reveal an unexpected history. Often, it seems, there is very little 'natural' or 'normal' about that which we consider to be both. 'Universals' are, rather frequently, not all that universal.

In essence, archaeology's appreciation of maps is still a modernist one. We approach maps with a naïveté no longer found in cartography – the functional, objective, 'tool of the trade' approach alluded to above – rather than reading, in a Derridean sense, 'between the lines of the map … and through its tropes to discover the silences and contradictions that challenge the apparent honesty of the image' (Harley 1989, 3).

Arguably, the cultural and geopolitical contexts that gave rise to the dominance of 'north up' maps and the Mercator Projection has passed (or, at least, should now be moved on from). The question then becomes how best to depict the world in a way that does not fall into the trap of normalising a colonial perspective. Comprehensive (or, indeed, articulate) discussions of decolonisation practice – and, just as importantly, neo-colonialism – are beyond the purview of this piece. However, it should be clear that, in the making of a *world* map, a culturally specific problematic such as the one outlined above cannot be resolved by falling back on further relativism. This will, as Graeber (2015) notes, simply introduce further fragmentation and subjectification at the expense of moving forward *together*. The only possible way forward is rather through the search, no doubt haphazard, for new, *holistic* universals. A great example of just such an attempt elsewhere is Sujit Sivasundaram's *Waves Across the South* (2020). This work attempts a new, synthetic history of the so-called 'Age of Revolution' that appropriately re-centres focus beyond a dated emphasis on the Global North. In the present context, an updated understanding of how to 'read' maps

– and, just as importantly, what exactly it is that we are *writing* in the Derridean 'margins of the text' when we make maps – is essential.

Conclusion

For an institute that prides itself, justifiably, on the global reach, focus and perspective of its research, mapping the world through a traditional, staid and particularist lens seems inadequate. This is particularly the case if we are to escape the colonial and imperialist roots from which the discipline arose. The world map presented here is purely experimental; it comes with no guarantee of utility, much less of success. Rather it is an invitation to think more critically about what our maps do and what impact they may have. The great social geographer Danny Dorling (2017, 558) is optimistic on the potential of maps:

> Maps can change the world because it is through maps that the world is imagined in the minds of those who change it. Change the map and you change how the world is viewed. Change how the world is viewed and you change the prejudices of those who can change the world. Change their prejudices and they will then change the world differently to how they might otherwise have behaved.

While a world map in *Archaeology International* most assuredly is not going to change anything, let alone the world, the disorienting effect of viewing the world in a different way will perhaps inspire new ways of conceptualising it, past and present.

Acknowledgements

Many thanks to Yijie Zhuang for pointing me towards important sources concerning cartographic practices in China. I am also very grateful to Alice Stevenson and Chloë Ward for most helpful comments on early drafts of this paper and to the anonymous reviewer for their valuable comments.

Declarations and conflicts of interest

Research ethics statement

Not applicable to this article.

Consent for publication statement

Not applicable to this article.

Conflicts of interest statement

The author is Features Editor for this journal. All efforts to sufficiently anonymise the author during peer review of this article have been made. The author declares no further conflicts with this article.

References

Abee, Michele. 2021. 'The spread of the Mercator Projection in Western European and United States cartography', *Cartographica* 56 (2): 151–65. https://doi.org/10.3138/cart-2019-0024.

Ashworth, Mick. 2019. *Why North Is Up: Map conventions and where they came from.* Chicago: University of Chicago Press.

Battersby, Sarah E., Michael P. Finn, E. Lynn Usery and Kristina H. Yamamoto. 2014. 'Implications of Web Mercator and its use in online mapping', *Cartographica* 49 (2): 85–101. https://doi.org/10.3138/carto.49.2.2313.

Brotton, Jerry. 2014. *A History of the World in Twelve Maps.* London: Allen Lane.

Crawford, L. Elizabeth, Skye M. Margolies, John T. Drake and Meghan E. Murphy. 2006. 'Affect biases memory of location: Evidence for the spatial representation of affect', *Cognition and Emotion* 20 (8): 1153–69. https://doi.org/10.1080/02699930500347794.

Dorling, Danny. 2017. 'Can a map change the world?'. In *The Routledge Handbook of Mapping and Cartography*, edited by Alexander J. Kent and Peter Vujakovic, 548–60. Abingdon: Routledge. https://doi.org/10.4324/9781315736822.

Gillings, Mark, Piraye Hacıgüzeller and Gary Lock, eds. 2018. *Re-Mapping Archaeology: Critical perspectives, alternative mapping*. Abingdon: Routledge. https://doi.org/10.4324/9781351267724.

Graeber, David. 2015. 'Radical alterity is just another way of saying "reality": A reply to Eduardo Viveiros de Castro', *HAU: Journal of Ethnographic Theory* 5 (2): 1–41. https://doi.org/10.14318/hau5.2.003.

Harley, J. Brian. 1989. 'Deconstructing the map', *Cartographica* 26 (2): 1–20. https://doi.org/10.3138/E635-7827-1757-9T53.

Harley, J. Brian. 1990. 'Cartography, ethics and social theory', *Cartographica* 27 (2): 1–23. https://doi.org/10.3138/C211-1512-0603-XJ14.

Herb, Guntram H. 2017. 'Maps, power and politics'. In *The Routledge Handbook of Mapping and Cartography*, edited by

Alexander J. Kent and Peter Vujakovic, 427–38. Abingdon: Routledge. https://doi.org/10.4324/9781315736822.
Hobsbawm, Eric J. and Terrance O. Ranger. 1983. *The Invention of Tradition*. Cambridge: Cambridge University Press.
Lakoff, George and Mark Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.
Lucas, Gavin. 2015. 'The mobility of theory', *Current Swedish Archaeology* 23 (1): 13–32. https://doi.org/10.37718/CSA.2015.01.
Malys, Stephen, John H. Seago, Nikolaos K. Pavlis, P. Kenneth Seidelmann and George H. Kaplan. 2015. 'Why the Greenwich Meridian moved', *Journal of Geodesy* 89: 1263–72. https://doi.org/10.1007/s00190-015-0844-y.
Meier, Brian P. and Michael D. Robinson. 2004. 'Why the sunny side is up: Associations between affect and vertical position', *Psychological Science* 15 (4): 243–7. https://doi.org/10.1111/j.0956-7976.2004.00659.x.
Meier, Brian P., Arlen C. Moller, Julie J. Chen, and Miles Riemer-Pelz. 2011. 'Spatial metaphor and real estate: North–south location biases housing preference', *Social Psychology and Personality Science* 2 (5): 547–53. https://doi.org/10.1177/1948550611401042.
Monmonier, Mark. 2004. *Rhumb Lines and Map Wars: A social history of the Mercator Projection.* Chicago: University of Chicago Press.
Needham, Joseph. 1959. *Science and Civilisation in China*, Volume III: *Mathematics and the science of the heavens and the earth.* Cambridge: Cambridge University Press.
Nelson, Leif D. and Joseph P. Simmons. 2009. 'On southbound ease and northbound fees: Literal consequences of the metaphoric link between vertical position and cardinal direction', *Journal of Marketing Research* 46 (6): 715–24. https://doi.org/10.1509/jmkr.46.6.715_JMR6A.
Sivasundaram, Sujit. 2020. *Wave Across the South: A new history of revolution and empire.* London: William Collins.
Snyder, John P. 1993. *Flattening the Earth: Two thousand years of map projections.* Chicago: University of Chicago Press.
Thuram, Lilian. 2022. *White Thinking: How racial bias is constructed and how to move beyond it.* London: Hero.
Usery, E. Lynn. 2017. 'Understanding map projections'. In *The Routledge Handbook of Mapping and Cartography*, edited by Alexander J. Kent and Peter Vujakovic, 202–22. Abingdon: Routledge. https://doi.org/10.4324/9781315736822.
Wang, Aihe. 2000. *Cosmology and Political Culture in Early China.* Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511529221.
Yee, Cordell D. K. 1994. 'Reinterpreting traditional Chinese geographic maps'. In *The History of Cartography*, Volume II, Book II: *Cartography in the traditional East and Southeast Asian societies*, edited by J. Brian Harley and David Woodward, 35–70. Chicago: University of Chicago Press.