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Spotlight On...

The mapping revolution

Alastair Bonnett

ABSTRACT: The rapid expansion of the use of maps across everyday life as well as the sciences and arts is changing our relationship to cartography. This article argues that we are experiencing a 'mapping revolution'. As the importance of mapping becomes clear, so to does the importance of considering both the diverse traditions of mapping and the potential of mapping in the field of astrogeography.

Keywords: mapping, cartography, astrogeography, art, Google Maps

Introduction

Maps have always been important, but now they are everywhere. Billions of people are simultaneously locating themselves and being located: our smartphones track our movements as well as the bus, taxi or package we are expecting. The mapping revolution reflects a leap in the power of maps: they are far more portable and detailed than ever before and can be updated in real time. This is also why they have moved from being mere illustrations to a core research tool across the sciences. New maps of the universe, maps of urban noise, maps that show connections between trees and fungi and 3D maps of the human brain, are just some of the examples I use in *40 Maps that Will Change How You See the World* (Bonnett, 2024), a book that tries to capture the fizz and diversity of our new cartographic civilisation.

Myriad maps

40 Maps joins a flotilla of new map books: publishers once saw the topic as fringe interest, but now it is mainstream and mass market. The precision of modern maps, and their ability to harness big data, explains much of this explosion. However, it also reminds us that maps span technology, literature and art and are uniquely capable of showing context and connectivity. No wonder then that map making has also been discovered by artists. Kate McLean's (2024) smell maps provide topographical lines of distinct aromas, from roses to vinegar, collected on her wanders through different cities. Digital artist Jeremy Wood (2014) has created 'My Ghost' maps based on his GPS tracks across London over 15 years. The results are a mysterious and beautiful set of spatial inscriptions, intensely patterned around the routes he frequents, such as the M25, but unlined and empty across most of the city. Wood's aim, he tells us, 'is a form of personal cartography that documents my life' (Wood, quoted in Hight, 2011).

It is unclear whether the geography profession has grasped the significance of the mapping revolution. The theme of the Royal Geographical Society's 2024 Annual Conference was mapping, but the topic still has a meagre presence in geography university textbooks or curricula. A large and eager public is looking to geographers to explain maps, not because they are map hobbyists but because modern lives are cartographical lives, for better and for worse. While the mapping revolution is exciting it is also overwhelming and disempowering. Knowing that one is being tracked, pinpointed and reduced to a mobile data set, can be both stressful and humiliating, especially when you have x minutes to deliver a package to y, or because your face is logged on a police or border control system (which it probably is).

Like many revolutions, the mapping revolution is both top down and bottom up. The Missing Maps (2024) project is putting poor and marginalised communities on the map across Asia and Africa, helping to ensure they get access to public services and legal representation. It has never

been easier to make maps that make a difference. One of my favourites is the noise map of Mexico City. In 2011, a group of civic organisations in Mexico City got together to create what became a founding statement in the field of environmental acoustics (Rodriguez-Manzo *et al.*, 2016). It is not a fine-grain vision, but a city-wide wakeup call and it goes for the jugular. The map is full of feverish colours, a cartographic migraine of reds and oranges, that involved the analysis of around 2200km of roads. The high noise ranges on the map go from 75 to 85 decibels, which is about the same as that made by a blender, lawn mower or subway train. If you are exposed to this noise level for eight or so hours a day, it will lead to hearing loss. Today, many urban residents have impaired hearing, and there is a direct correlation between wealth and exposure to noise pollution. Street vendors and other people who live hard by the road in Mexico City get the worst of it. Today, maps of noise are being used by city authorities and activists across the world and are a key tool to making visible this new health and wellbeing crisis.

Lines of control

Despite its many uses, the digital world is not a democracy. Google is, arguably, the world's map maker and it keeps a tight hold of its copyright. Every Google Map you see is company property. Users are granted permission to view them, nothing more. This is why my publisher had to draw its own version of the Google map of Kashmir (Figure 1). Kashmir is a country of snow-white mountains and wide green valleys that should be full of tourists but instead it is full of soldiers. Kashmir sits at the top of India and on the eastern side of Pakistan. In both countries, Google's share on the mobile search engine market is almost 100% and it is Google that determines that what Google Map users in India see is very different to those in Pakistan. Users in India see a map of Kashmir where the whole of it – and not just the bit that is actually administered by India – is under Indian control (Figure 1a). By contrast, Google Map users in Pakistan (and elsewhere) see a lot of dotted lines across Kashmir; these indicate disputed lines of control, not just between Pakistan and India, but also China, which claims and controls the zones on the eastern side of the map. One of these dotted lines – the one that marches out across the middle of the territory (see Figure 1b) – is so uncertain that it appears to give up. It stops, paralysed by worry, in a high, cold nowhere, or more precisely in a frozen slope in the Himalayas, which separates Kashmir from China.

It is not that these two maps differ that matters – maps have always differed – but that one American private company, along with a handful of other big players, control the world's maps and have the power to arbitrate who sees what. The mapping revolution is many things, but it is not a people's revolution. Nevertheless, it remains appropriate to call it a revolution because it is reconstituting social and political life as well as scientific endeavour. It empowers and amplifies the influence of cartography in all these fields.

Lost traditions

The mapping revolution forces us to understand the power of maps and, as a consequence, may help provoke a reassessment of the world's mapping traditions, especially those that have been lost or become marginalised. I think of these traditions as akin to languages. The loss of a language is generally understood to mean the loss of a culture and way of thinking. Something similar happens when mapping traditions become extinct.

One example is the lost maps of the Aztecs. In the Americas, most pre-colonial maps (along with untold numbers of other books, texts and artworks)

Figure 1: *Different versions of Kashmir, as seen by Google Maps users in: (a) India, and (b) Pakistan and elsewhere.*

were destroyed by European invaders. The invaders accused these artefacts of being demonic and burned them. There are very few survivals. One of the most significant, a map of the Apoala Valley in Oaxaca, Mexico – the *Codex Nuttall* – is reproduced here (Figure 2). It does not look like a map.

Today our idea of what maps look like is very literal. We think of them as tiny two-dimensional versions of reality, usually as seen from above (or, increasingly, in 3D). The Aztecs did create topographical maps, what we would think of as 'proper maps'. They are all lost, but we know they existed because the conquistadors wrote about them. The *Codex Nuttall*, a rare pre-colonial survivor from the 1400s – a map of the Apoala Valley – is not a top-down map; instead it introduces us to a unique cartographic tradition. It helps to know that the Apoala Valley is shown in cross-section: the stripy shapes on the sides and bottom are the sides and bottom of the valley. Their stripiness indicates that this is soil and the double curls on their underside represent stone. The two u-shaped forms on the floor of the valley are rivers. You may be able to spot fish and wavy, water lines. High up on the left side of the main valley there is a rather alarming monster with its mouth sprung open: this tells us there is a cave here. This Aztec map may look strange, but, once we decode the symbols, things fall into place. What is happening on the right-hand side of the valley? A naked half figure disappears into the cliff, on which stands a tree and there is also what looks like a waterfall. Barbara Mundy (an authority on Aztec art) tells us that there is a lot of birth imagery at work here, related to the origins and lineage of local people, and that the half body shows that this is the 'cliff of the childbirth' and that the tree 'may refer to the Apoala birth tree, from which important Mixtec lineages were born' (Mundy, 1998, p. 216).

While the mapping revolution shows the power of mapping, in doing so it can also shine a light on the paths not taken, on the diverted and cut-off roots and routes of cartography that can, nevertheless, still inspire us.

Astrogeography

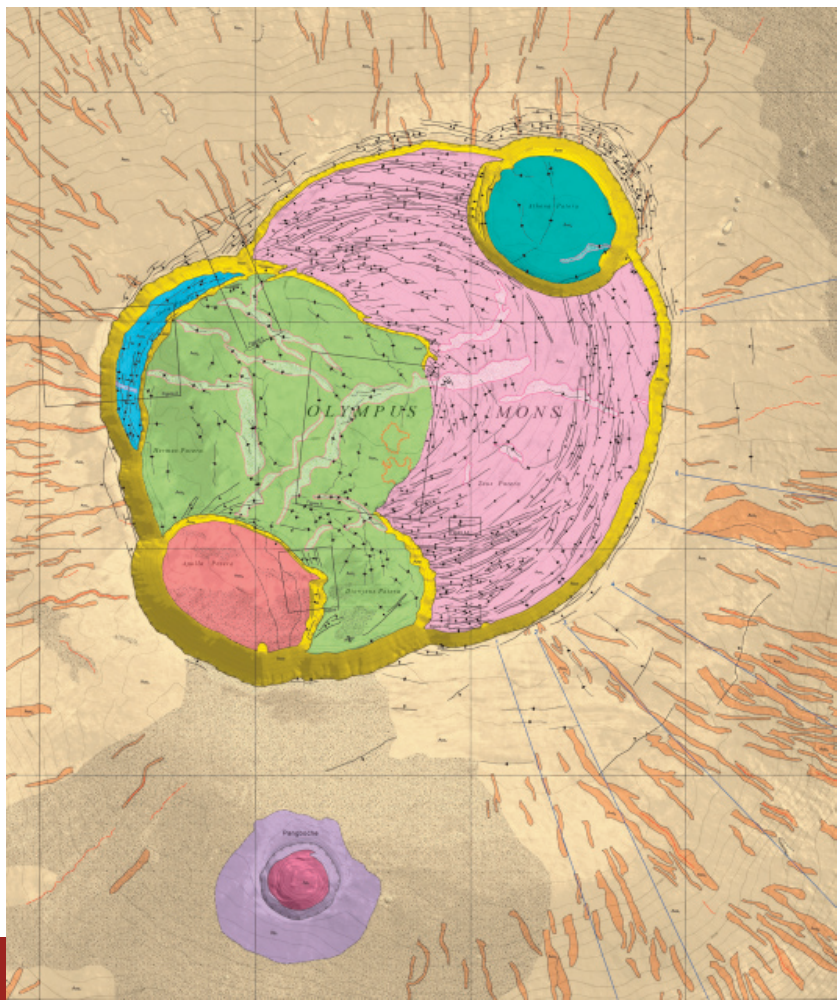
One of the most inspiring new horizons for cartography is astrogeography. The quality and detail of maps of other planets is developing rapidly, but so too is the scope of these maps. The detail of the new maps of our neighbouring planets, such as the geologic map of the Olympus Mons caldera on Mars (Figure 3), which is at 1:200,000 scale, familiarises the unfamiliar. This is particularly striking when, as here, the mapped

Figure 2: *This map, the* Codex Nuttall*, shows the Apoala Valley in Oaxaca, Mexico. Photo © The Trustees of the British Museum (CC BY-NC-SA 4.0).*

Figure 3: *Geologic map of the Olympus Mons caldera, Mars, 2021. Source: USGS Astrogeology Science Center, Flagstaff, Arizona.*

landscape is so extraordinary. Olympus Mons is 600km across (about the same size as Poland) and 26km high (three times the height of Everest).

Perhaps the most striking astrogeographical maps are those of the universe and its largest structures, which are called superclusters. The map of the supercluster we live in, Laniakea, is the most famous of these immense structures (see Gibney, 2014). Produced by a team from the University of Hawaii (*laniakea* is Hawaiian for 'immense heaven'), the map covers an area equivalent to 520 million light years (Brent Tully *et al.*, 2014). We have known for a long time that our solar system forms part of something bigger. Eventually it was discovered that our sun and all its revolving planets are located amid many other solar systems, which together make up one tendril of one arm of the hundred billion stars and billions more planets that constitute the spiralling cosmos we call the Milky Way. While astronomers knew about galaxies beyond the Milky Way, it used to be thought they were disconnected colossi, hurtling in isolation through space away from the Big Bang. We now know this was a mistake: galaxies are not the biggest thing in the universe. They are part of larger structures, such as Laniakea. To know our place in the universe we need to know the names of these megastructures and understand our relationship to them. There are galaxies, then there are galaxy clusters and, bigger still, superclusters. Laniakea is a supercluster; it is our supercluster, comprising 100,000 and 150,000 galaxies including the one we call home: the Milky Way.



The mapping revolution reconstitutes our relationship to the near and far. It paces out our steps as we turn a corner and it pinpoints our place in the universe. The psychological impact of this new and intense relationship to maps remains unclear. Sometimes it appears liberating, a cartographic enlightenment; at other times it feels oppressive and controlling. It brings in an anxiety of which previous generations were innocent, the worry of being, if only briefly, 'off the map'. An irony of the mapping revolution is that it makes the experience of being lost feel rare, fleeting, but also somehow special.

References

Bonnett, A. (2024) *40 Maps that Will Change How You See the World*. London: Ivy Press.

Brent Tully, R., Courtois, H., Hoffman, Y. and Pomarède, D. (2014) 'The Laniakea supercluster of galaxies', *Nature*, 513, pp. 71–3. https://doi.org/10.1038/nature13674

Gibney, E. (2014) 'Earth's new address: "Solar System, Milky Way, Laniakea"', *Nature*, 3 September. https://doi.org/10.1038/nature.2014.15819

Hight, J. (2011) 'Interview with Jeremy Wood', *LEA Interview*. Available at https://leoalmanac.org/wp-content/uploads/2011/07/wood.pdf

McLean, K. (2024) *Sensory Maps*. Available at https://sensorymaps.com

Missing Maps (2024) https://www.missingmaps.org

Mundy, B.E. (1998) 'Mesoamerican cartography' in Woodward, D. and Lewis, G.M. (eds) *The History of Cartography 2: 3 Cartography in the traditional African, American, Arctic, Australian, and Pacific societies*. Chicago, IL: University of Chicago Press, pp. 183–256. Available at https://press.uchicago.edu/books/HOC/HOC_V2_B3/HOC_VOLUME2_Book3_chapter5.pdf

Rodriguez-Manzo, F., Garcia-Martinez, S., Lancon-Rivera, L. and Ponce-Patron, D. (2016) 'Towards an acoustic categorization of urban areas in Mexico City', *INTER-NOISE and NOISE-CON Congress and Conference Proceedings*, InterNoise16, Hamburg, Germany, pp. 6841–7829. Available at https://www.ingentaconnect.com/contentone/ince/incecp/2016/00000253/00000001/art00003

Wood, J. (2014) *GPS Art*. Available at http://www.gpsdrawing.com/info.html

All URLs last accessed 26/11/2024.

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