Geographies of Digital Exclusion

‘Conceptually rich and well-illustrated, this is a valuable analysis of data power at the global scale.’
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‘An enlightening and accessible introduction to digital geographies and why they are important to our understanding of digital exclusion.’
—Alex Singleton, Professor of Geographic Information Science, University of Liverpool

‘Demonstrates how so much digital data is sourced from a very limited range of geographical locations and laboured over in various ways, and what difference this makes to the information about places on platforms like OpenStreetMap, Google Maps and Wikipedia.’
—Gillian Rose, Professor of Human Geography, School of Geography and the Environment, University of Oxford

‘Systematic, sobering, yet uplifting, this volume makes the convincing case that digital transformation is not the end of geography, nor is it an equaliser for the diverse cultures and peoples across the globe.’
—Jack Linchuan Qiu, Professor at the Department of Communications and New Media, National University of Singapore

‘An important and insightful book. Graham and Dittus eloquently map, measure and critically interrogate digital geographies in a way that forces us to reckon with their power and politics, the injustices they incur, and how we might imagine alternatives.’
—Professor Lina Dencik, Co-Director of the Data Justice Lab, Cardiff University

‘A must read for those deeply concerned about long hidden people and places who have been marginalised in the politics of place-making, including within digital worlds like Wikipedia and Google.’
—Payal Arora, author of The Next Billion Users and Co-Founder of FemLab.Co
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Governments of the Industrial World, you weary giants of flesh and steel,
I come from Cyberspace, the new home of Mind. On behalf of the future,
I ask you of the past to leave us alone. You are not welcome among us.
You have no sovereignty where we gather.

We have no elected government, nor are we likely to have one, so I address
you with no greater authority than that with which liberty itself always
speaks. I declare the global social space we are building to be naturally
independent of the tyrannies you seek to impose on us. You have no
moral right to rule us nor do you possess any methods of enforcement we
have true reason to fear.

Governments derive their just powers from the consent of the governed.
You have neither solicited nor received ours. We did not invite you. You
do not know us, nor do you know our world. Cyberspace does not lie
within your borders. Do not think that you can build it, as though it
were a public construction project. You cannot. It is an act of nature and
it grows itself through our collective actions.

You have not engaged in our great and gathering conversation, nor did
you create the wealth of our marketplaces. You do not know our culture,
our ethics, or the unwritten codes that already provide our society more
order than could be obtained by any of your impositions.

You claim there are problems among us that you need to solve. You use
this claim as an excuse to invade our precincts. Many of these problems
don't exist. Where there are real conflicts, where there are wrongs, we
will identify them and address them by our means. We are forming
our own Social Contract. This governance will arise according to the
conditions of our world, not yours. Our world is different.

Cyberspace consists of transactions, relationships, and thought itself,
arrayed like a standing wave in the web of our communications. Ours is
a world that is both everywhere and nowhere, but it is not where bodies live.

(John Perry Barlow, A Declaration of the Independence of Cyberspace, 1996)

**THE CARTOGRAPHIC ATTRIBUTES OF THE INVISIBLE**¹

The internet used to be a faraway place. You would tap into the net through a clunky terminal and be transported into another world. People talked about travelling down an information superhighway, and surfing the net. We would enter a cyberspace and get ‘online’. It was never fully clear where the internet was, but what all of those visions had in common is that they weren’t *here*. John Perry Barlow’s ‘Declaration of the Independence of Cyberspace’ famously summed up some of these transcendent visions. The internet was a new world for all of us to build: a world with its own culture, economy, politics, ethics and – most importantly – space.

But with every year since the penning of that Declaration in the late 1990s, something else has happened instead. We have found ever more ways of embedding the internet into everyday life and everyday places.

*Temperance Street, Manchester*

Temperance Street in Manchester is a short road that is only a stone’s throw from Manchester Piccadilly train station. It looks a lot like many other streets near British railway stations: on one side there is a brick viaduct for the main rail line into Piccadilly. The arches under the viaduct host garages, wholesalers and other businesses that don’t necessarily need to be in a more trafficked area. Moss, weeds and bushes grow out of the bricks, giving the road a relatively unkempt – even dishevelled – look.

Temperance Street is therefore a rather unassuming place, and most people from outside of Manchester (and indeed many within it) had likely never heard of it until Google Street View helped to bring this small corner of the city to fame. However, the attention it received was not necessarily the sort of attention that the Manchester tourist board would have chosen.

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¹ This phrase was coined by William Gibson in his 2008 novel, *Spook Country.*
Like most European cities, most of Manchester is mapped by Google’s Street View feature, which allows people to virtually ‘be there’ in a three-dimensional snapshot of every navigable part of the city. Ironically, Temperance Street – named after the nineteenth-century mass movement to promote abstinence from excesses – was the site of an extremely public sex act. Anyone using Google Maps to navigate through that part of the city to the station wouldn’t just see the garages, parked cars and railway arches that make up Temperance Street; they would also see an image of a woman performing fellatio on a man leaning, pants down, against the viaduct.

After being noticed, the image quickly went viral. Journalists expressed shock that such a scene could be found in Google’s depiction of Manchester, and social media commentators took great delight in seeing the city documented in such a raw and uncensored way. Before long, Google had removed the offending stretch of road from Street View.

Where is Jerusalem?

The city of Jerusalem has been at the centre of ethno-political struggles for millennia. As a holy city to Jews, Christians and Muslims, the city is ascribed with tremendous importance by adherents of all of those faiths. The western neighbourhoods of the city are primarily home to Jewish residents and have been under Israeli rule since the 1948 Arab–Israeli War. East Jerusalem, on the other hand, is home to almost all of the city’s Muslim population, although Israel has administered East Jerusalem since 1967 – that is, following the Six-Day War. The city serves as the capital of the Israeli state, while also being the desired location for the capital of the State of Palestine. However, most of the rest of the world refuses to recognise the city as the capital of either state: which is why it was such a newsworthy event when the US Embassy was moved from Tel Aviv to Jerusalem in May 2018, following a campaign promise made by Donald Trump the previous year. These fundamentally differing – and apparently irreconcilable – views about the status of this contested city in many ways lie at the very heart of the Israeli–Palestinian conflict.

Of course, a key way that many people learn about the city is through Wikipedia. Indeed, every major Western search engine links to Wikipedia’s Jerusalem article when conducting a search for the city. Jerusalem is one of the encyclopaedia’s most popular pages, and – because of Wikipedia’s open licence – content on the Jerusalem page ends up being reused.
and replicated elsewhere on the internet, from Facebook to weather apps. As such, it should come as no surprise that the page itself is highly susceptible to editorial conflict.

One of the many ways in which this conflict has been manifested is through the question of how best to represent its capital city status. At the time of writing in early summer 2021, the English version of Wikipedia (after much battling between various editors) notes in the first paragraph of the article that ‘Both Israel and the Palestinian Authority claim Jerusalem as their capital, as Israel maintains its primary governmental institutions there and the State of Palestine ultimately foresees it as its seat of power; however, neither claim is widely recognized internationally.’ This contrasts noticeably with the Arabic Wikipedia’s opening claim that Jerusalem is ‘the largest city in occupied Palestine’ and the Hebrew Wikipedia’s opening sentence that ‘Jerusalem is the capital city of the State of Israel.’ In this peer-produced encyclopaedia that – famously – anyone can edit, we see different people and communities wanting to represent the exact same place in fundamentally divergent ways.

The West African Ebola epidemic

In early 2014, the West African country of Guinea faced an early outbreak of Ebola, now widely known as one of the world’s deadliest diseases with an average fatality rate of 50 per cent. At the time there were no vaccines or treatments for Ebola available, beyond supportive care with rehydration and symptomatic treatment. After its initial reporting in rural Guinea, it subsequently spread to the densely populated capital Conakry, then to neighbouring Liberia and Sierra Leone and beyond. Global aid organisations such as Médecins Sans Frontières and the Red Cross were ready to spring into action with medical aid, but quickly found that large parts of the affected regions were as yet unmapped in commercial or public sources. In order to coordinate aid, their field logistics teams needed population estimates to prepare sufficient provisions, and they needed information about the local road network to coordinate delivery. Instead, they were faced with a blank map – neither the national mapping agencies nor commercial geodata providers had mapped the affected areas (Clark 2014).

This geospatial information gap was ultimately resolved by an unusual collaborator: the Humanitarian OpenStreetMap Team (HOT), a global non-profit organisation that specialises in the production of
crowdsourced digital maps, traced from satellite imagery by a global volunteer force, with the specific intention to support humanitarian aid. In response, HOT organisers initiated a multi-month effort to recruit and train digital volunteers at large scale, resulting in its largest mapping project to date. Ultimately the effort was successful, and new map data were quickly made available to coordinators, drastically improving the capacity of aid organisations to provide medical support (Clark 2014; Dawson 2014).

These volunteer maps can have significant reach beyond their primary purpose. Thanks to OpenStreetMaps’ open licence, other mapping providers are able to integrate these volunteer contributions into their own maps. For example, both Google Maps and Bing maps are now selectively integrating OpenStreetMap data into their own maps of remote areas in order to fill in coverage gaps. As a consequence, volunteer maps that have been collected in the context of disaster response become significant digital representations of places that have fewer alternatives available, commercial or public. In a sense, we can consider these initiatives as part of an effort to improve digital representation of the Global South, even if that is not necessarily the primary aim of the original work.

And yet, we can also consider them to be ‘outsider maps’ – both in the sense of being volunteer efforts by non-professional and professional cartographers alike, but also remote efforts by people from outside the areas they are representing. The maps are typically traced from satellite imagery by remote mappers who lack local knowledge of the terrain and the street-level experience of the places they map. Thematically, disaster-response maps focus on a limited set of functional concerns that are needed for field logistics, such as road networks to plan transport routes, and the tracing of settlements to support population estimates. The resulting representations are insufficient to navigate a city, at least not without first having to augment them with further information such as street names and the locations of public amenities.

*What are digital geographies, and why do they matter?*

The three cases presented here range from the humorous to the life changing, but what they have in common is that they tell us stories about how digital information is enrolled into everyday geographies. When most people think about geography, they tend to think about the study of the world’s mountains, rivers and place names. Yet, it’s guaranteed that
if you approach a professional geographer with the joke that their job involves memorising the name of all the world’s capital cities, you’ll be met with an eye roll.

Geography is location. It is interconnections, flows and networks. It is both materiality and discourse. It is grounded, but in flux. It has a multiplicity of histories and futures. It is local, global and relational. It is space and time. It is undergoing continual augmentation by the anthroposphere. It is made up of memory and imagination. It is a platform and a process. It both shapes and is shaped by geometries of power. It is experienced, produced and continuously brought into being. And, it is, of course, also digital.

At the end of the day, we care about geography because we care about the world: the environmental, economic, social and political contexts, ecosystems and networks that we are embedded in. We care about how things work, how things are represented and the relationships between those things. So, think about the place that you live in. There are surely some local conflicts about land ownership; about who gets to have a say in how, where and for whom new buildings are built. There are also likely conflicts about how things are represented: perhaps whether a street should be renamed to avoid commemorating that historical figure who now looks somewhat less heroic and noble than he used to.

In the digital age, some of these concerns merge. By augmenting our world with digital information, contemporary information technologies shape both the ways in which geographies are structured and the ways in which they are represented. Indeed, it starts to become hard to distinguish between those things.

As the digital is ever more infused into our everyday lives, John Perry Barlow’s vision of what the internet was, and could be, is revealed as simple wishful thinking. The geography of the internet no longer involves just a mapping of virtual realities and digital worlds. Indeed, the examples above show that the cities we live in are much more than just their material presences. Take the place that you live in as an example: you’re surrounded by buildings and roads, concrete, bricks and glass, houses and shops. But you’re also surrounded by information and code that is invisible to the naked eye but which fundamentally alters how the city functions and how we interact with it.

What this means is that we are all now digital geographers. The cities that we live in are shaped by a digital bedrock, by palimpsests of
digital infrastructure and architecture, and by the digital mediums and platforms that support much of our social relations.

We use the term ‘palimpsest’ here not in the way that a historian or librarian would use the term. For them, a palimpsest is a page, typically of expensive but durable vellum, that has been recycled and reused (see Figure 1.1 for a palimpsest containing parts of the Gospel of St Luke, as well as portions of the treatise by Severus of Antioch against John the Grammarian, Homer’s Iliad and Euclid’s Elements). Because the earlier writings could never be fully erased despite repeated scraping, every writing block was a composite containing the superimposed traces of all previous texts (Crang 1996). This sort of layering, in which today’s surface is built over – and part of – the many that came before, can be used as a neat analogy for the contemporary city (Graham 2018). The city, in other words, is a palimpsest of material and digital strata that are interwoven and interlayered. Digital layers, together with material layers, compound over time.

Figure 1.1  The Codex Nitriensis. A Greek and Syriac palimpsest formerly belonging to the monastery of St Mary Deipara in the Nitrian Desert, northern Egypt, and now held by the British Museum. Source: Wikimedia Commons.
As we have discussed, our use of ‘digital geographies’ takes ‘digital’ to include technologies and the artifacts they produce, but also the practices and discourses surrounding them. So, in other words, we are talking about the ways in which such information surrounds and envelops our everyday lives.

If we think of those technologies, artifacts, practices and discourses as all having geographies, it is useful to think about them in three primary ways, following Ash et al. (2016). These are geographies of the digital (e.g. the geography of digital information), geographies produced by the digital (e.g. the mediation of everyday life through digital mechanisms), and geographies produced through the digital (e.g. geography captured through digital mechanisms). For the purposes of our mission in this book, we deploy a somewhat narrower operationalisation of the term. We will mainly use ‘digital geography’ as a shorthand for geographies of the digital (such as digital geospatial information). This book therefore will focus on two of today’s most important sites of maps and geographic information – Google and Wikipedia – and the representations they create of the world. However, in doing so, we will also be able to make inferences about geographies produced by the digital.

To do any of this, we need to make sure we properly understand the cartographic attributes of the invisible. We need to make sure that we’re able to map, measure and critically interrogate digital geographies.

In this book we seek to understand where digital geographies come from, what they depict (and leave out), and what happens when they are contested. We will ask how digital geographies exert power, who exerts power within them, where it is exerted and who it is exerted for and against, the mechanisms through which it is exerted, and ultimately how can we design more equitable alternatives. We do this through case studies of two of the world’s most important digital platforms: Google and Wikipedia. But to explain why we focus on those two platforms in particular, we’d like to first take you back to the work that was being produced hundreds of years ago in the form of so-called ‘cosmographies’.

Early cosmographers set themselves the modest task of collating all knowledge about the world or universe, captured and represented as
ordered collections of universal truths. While cosmographers were invested with considerable amounts of freedom to interpret the universe in whatever ways they saw fit, the universal knowledge presented by the many late Renaissance and early Enlightenment cosmographers was obviously coloured and shaped by the dominant social and political forces at the time.

An example is William Cunningham’s 1559 cosmography entitled *The Cosmographical Glasse*, a collection of information about world regions, human races, climate, biology, zoology and religious and cultural behaviour. But it was also overtly shaped by Cunningham’s personal beliefs, notably the ways in which he described every region of the world as being governed by particular astrological laws (Livingstone 1992). Similarly, the Franciscan friar Vincenzo Coronelli ‘sought to bring the ends of the earth within the scope of a single illustrated text’ (Cosgrove 1999, p. 41). One of his most noted projects was the construction of two giant globes which were supposed to be empirically accurate representations of reality. And yet, at the same time, the content of globes was highly influenced by their patron Louis XIV, the Sun King, so much so that the stars are fixed in the location at which they were to be found at the birth of the king.

So while myriad instances of cosmographic knowledge existed, each proclaimed to reveal universal truth. This inherent contradiction in the nature of cosmographic knowledge was likely a factor in the formation of a new way of understanding the universe: natural history. The knowledge-building project of natural history was intended to observe and catalogue nature in order to construct a ‘planetary consciousness’ (Pratt 1992), which itself was part of a larger enlightenment ontology which sought to understand and catalogue truth using objective scientific methods.

This can be seen in the mid-eighteenth-century work of Carl Linné who developed a descriptive system that could be used to classify all known and unknown plants on the Earth into one of 24 categories. The periodic table of elements, developed later in the nineteenth century, similarly classifies and arranges chemical elements in terms of their characteristics. Systems like these ordered chaos in a predetermined way,

2. The Greek word ‘Kosmos’ describes order and harmonious arrangement – a cosmography is therefore an ordered mapping or understanding of how the universe is arranged and works.
and the rules of the ordering were to be systematically established by a few European scientists.

This ambitious project of systemising global knowledge had never before been attempted. Reality was no longer open to subjective interpretation. In a highly reductionist manner, everything in the universe could be described in predetermined ways and placed into predetermined systems. Once the grid was constructed, ‘every visible square, or even cubic, inch of the earth’s surface’ (Pratt 1992, p. 30) would fall into its unquestionable place within it. The planetary consciousness this system gave rise to was both pervasive and imperial. It extended to all corners of the globe and did not tolerate alternate epistemologies. Local and individual epistemologies were now irrelevant to the established system. Local knowledge could only contribute to the scientific project insofar as it could be moulded into the scientific system. And while this meant that knowledge was often pushed, crammed and twisted into its proper place in the classificatory system, the dominant epistemological grids, established in European centres, both structured the nature of the universe and established the meaning of truth.

Practices of knowledge production have moved on significantly in the digital age. There are active efforts to decentre systems of knowledge and to invite a multitude of voices from the margins. However, what hasn’t changed is the totalising, cosmographical ambition. Today, Google and Wikipedia are two of the largest publicly available platforms that aggregate geographic knowledge. From Wikipedia’s original mission to be ‘the sum of all human knowledge’ to Google’s to ‘organise all the world’s information’, both platforms have cosmographical ambitions.

The ‘mission’ and ‘purpose’ statements of both platforms at the time of writing are no less universal in their objectives. Google Maps proudly boasts of its ability to represent everywhere: ‘What is a map when it’s more than just a map? It’s a tour of the moon, a ticket to Mars, and a bird’s-eye view of Earth, from the highest mountains to the lowest valleys and everywhere in between.’ Wikipedia is no less ambitious in claiming that it ‘has a lofty goal: a comprehensive collection of all of the knowledge in the world [...] Wikipedia is intended to be the largest, most comprehensive, and most widely-available encyclopedia ever written.’

These two platforms don’t just matter because of their grand ambitions, but also because together they mediate a significant amount of information for the world’s internet users. Content from Wikipedia is used in Google’s Knowledge Graph that appears on the first page of
search results. If a user searches for a name for example, Google displays biographical data from Wikipedia. Google is the world’s most popular search engine in almost every country in the world (with only Russia and China\textsuperscript{3-4} as large and notable exceptions).

**MAPS ARE NOT THE TERRITORY**

The first thing most people notice when looking at a historical map is just how inaccurate it is. We don't just mean the fantastical creatures and monsters that can be found in some pre-modern maps (Figure 1.2), or the glib labels of ‘terra incognita’ or ‘mare incognitum’ placed over unexplored parts of the globe, but simply the more subtle distortions, omissions and embellishments that we aren’t accustomed to seeing on contemporary maps. That is because the cartographic technologies that underpin the maps we use today leave little to the imagination. We no longer wonder if there is land west of Europe, whether California is an island, and if there really be dragons in the far north. Today’s maps are much more objective – indeed, accurate and truthful – representations of the world, right?

The answer is ‘not really’. Of course, we don’t mean to imply that the dragons and strange sea creatures of the Carta Marina have any place in today’s cartographic projects. However, it is important to remember that while today’s maps may seem accurate, precise and objective, there is no such thing as a true or complete map. Every map is (necessarily) a selective representation of the world, and in taming and making sense of the world’s infinite complexity, every map has its own particular and subjective story to tell.

Street maps take much care in distinguishing between different types of road, but tell you little about the presence or absence of potholes. Topographic maps give us a rich sense of the contours of the landscape, offering clues for how to navigate it physically, but reveal little about the

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3. The most popular search engines in Russia and China are Yandex and Baidu respectively. In 2010 Google shut down their search engine in China and has not since resumed operations.

4. As we discuss in Chapter 4, Chinese citizens are the world’s largest digitally connected population but Google and Wikipedia are not widely used in China. Internet geographies in China therefore fall out of focus in our research and there are many points in the book in which ‘What about China?’ would be a perfectly valid question to ask. We acknowledge this blind-spot, and acknowledge that we don’t have good answers to the aforementioned question.