

## INTRODUCTION

# Thinking spatially: new horizons for urban history

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### Abstract

A new opportunity, and a new challenge, presents itself to urban historians. In order to obtain a deeper understanding of historical urban space and spatial relationships, the contributors to this Special Issue deploy new techniques of spatial analysis using mapping tools to explore the density, frequency and proximity of various features of towns and cities. The contributors focus on case-studies at various urban scales – from major commercial centres (New York, Rome, Paris and London) – to smaller towns in the urban hierarchy. They also range across the tenth to the twentieth centuries and so challenge a common assumption that mapping the town is essentially an approach best suited to the modern period. Individually and collectively, the authors demonstrate how the urban morphology of the city developed and how durable that spatial patterning can be.

Towns and cities, and urban spaces in general, have always been and remain constrained – physically, juridically and administratively. The bounded and limited space of the town or city, whether defined by charter or statute, is contested by different users, and moderated and negotiated by institutions and by legal instruments enshrined in rules constructed by powerful interests. Even the most marginal of spaces has an intrinsic value to someone or some organization at some point in time. Locally, town and city space is managed in a mosaic of overlapping wards and constituencies, parishes and dioceses, districts and zones, with powers to administer schools, policing,

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Higher resolution, colour versions of the figures in this article can be viewed online as supplementary material. Follow the URL at the end of this article.

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transport, parks and public health discharged according to subdivided units that rarely, if ever, correspond exactly. Each of these urban administrative polygons is complicated further by powers invested locally in community and neighbourhood organizations, and spaces of production and consumption vie with residential, institutional and administrative spaces, and each use, and each individual user, shapes and contests these urban spaces according to creed and commercial utility.

An administrative mosaic therefore underpins the complex bases upon which spatial data has been collected historically and, as the contributors' insights to this Special Issue show, using Historical Geographical Information Systems (HGIS) can inform the processes of urban development and change through an analysis of space and spatial relations. It is important to note that spaces and places are not simply a given entity but are socially constructed. The term 'spatial relations' therefore encompasses the formation of spatial configurations and hierarchies arising from social interactions as well as from spatial practices and perceptions. By 'spatiality', we understand a reality constructed by the spatial actions of actors in a historical-anthropological consideration of dynamic space – arrangement, movement and interaction. In essence, space is not a given and only exists when it can be experienced by subjects or when subjects act spatially in everyday circumstances.

The theme of contested space owes much to Henri Lefebvre whose *History of Everyday Life* (3 volumes) paved the way for his highly influential *The Production of Space* with its fusion of mental and physical space.<sup>1</sup> These and other works<sup>2</sup> sign-posted both the need for a deeper understanding of the experience of everyday life in the city, and a desire to move beyond an understandable policy priority on physical planning and reconstruction which held sway after 1945.<sup>3</sup> In historiographical terms, and with the benefit of hindsight, what was already underway in the 1960s and the early 1970s was a transformation – from the study of the *city* to the study of the *urban*.<sup>4</sup> Or, expressed differently, from a focus on a spatial entity to a focus on a spatial dynamic through fragmented, contested urban space.

Consequently, the emphasis of urban historical research shifted from place to process. The underlying contemporary question, and perhaps a sign of urban malaise, was: 'what kind of social ties, relationship to nature, lifestyle, technologies and aesthetic values do we desire?'<sup>5</sup> Can the right to the city be achieved by reshaping

<sup>1</sup>H. Lefebvre, *Critique de la vie quotidienne*, 3 vols. (1947, 1961, 1981), translated as individual volumes in English (1991, 2002, 2005) and in a single volume *Critique of Everyday Life* (London, 2014); H. Lefebvre, *The Production of Space* (Oxford, 1991 edn). See also the influential work of D. Harvey, *Social Justice and the City* (Baltimore, 1973) and a recent reappraisal by J. Bauer and R. Fischer (eds.), *Perspectives on Henri Lefebvre. Theory, Practices and (Re)Readings* (Berlin and Boston, 2018).

<sup>2</sup>M. Castells, *The City and the Grassroots* (London, 1983); E. Soja, *Postmodern Geographies: The Reassertion of Space in Critical Social Theory* (London, 1989); and E. Soja, [www.jssj.org/article/la-ville-et-la-justice-spatiale/](http://www.jssj.org/article/la-ville-et-la-justice-spatiale/), accessed 27 Dec. 2018.

<sup>3</sup>A. Sutcliffe (ed.), *The Rise of Modern Urban Planning 1800–1914* (London, 1980); P.J. Larkham, *Shapers of Urban Form: Explorations in Morphological Agency* (London, 2014).

<sup>4</sup>F. Choay, 'Le règne de l'urbain et la mort de la ville', in *La ville, art et architecture en Europe, 1870–1993* (Paris, 1994), 26–35; H.J. Dyos and D. Reeder, 'Slums and suburbs', in H.J. Dyos and M. Wolff (eds.), *The Victorian City: Images and Reality* (London, 1973), 359–86; H. J. Dyos (ed.), *The Study of Urban History* (London, 1968), especially M.R.G. Conzen, 'The use of town plans in the study of urban history', 113–30.

<sup>5</sup>D. Harvey, 'The right to the city', *New Left Review*, 53 (2008), 23; H. Lefebvre, *Le droit à la ville* (Paris, 1968 edn).

the spaces of the city? Indeed, is a basic minimum of urban living space itself a human right? The transition was located in a contemporary political context surrounding the concepts of social justice which often found active and direct European expression in labour disputes, student revolts, anti-war demonstrations and extremist left-wing militant groups. Such movements challenged the power of private property, and identified income inequalities between rich and poor neighbourhoods as a fundamental basis for exploring the wider issues of spatial form and city management.

Space had acquired agency. A powerful dynamic was recognized between contemporary social and spatial issues and is explicitly recognized in a historical context as explored by the contributors to this Special Issue.

### Urban space and agency

Interactions with space have gone some considerable way to exploring LeFebvre's, Harvey's and others' quests for a better understanding of everyday events, and how individuals engage with urban space.<sup>6</sup> Recent analyses have already made significant advances in this respect.<sup>7</sup> Within towns and cities, there is a relational dimension in which observations of a socio-economic, cultural, religious and psychological nature interact and which, to a degree, can be mapped in the form of addresses (points) and areas (polygons). There is also a cognitive element in terms of values, beliefs, perceptions, emotions and appropriations which can be derived from analyses of behaviour in towns and cities.<sup>8</sup>

Where once the map was the final resting place of research data, what is 'new' and different in the twenty-first century is that the map has itself become part of the research dynamic – an integral part of the process of framing and testing hypotheses, as the contributors to the Special Issue show.<sup>9</sup> From the kernel of an

<sup>6</sup>For references to the geography of space, see L. Vaughan, *Mapping Society: The Spatial Dimension of Social Cartography* (London, 2018); B. Hillier, 'What are cities for? And how does it relate to their spatial form?', *Journal of Space Syntax*, 6 (2016), 199–212; S. Rau and E. Schönherr (eds.), *Mapping Spatial Relations, their Perceptions and Dynamics: The City Today and in the Past* (Cham, 2014); B. Hillier and L. Vaughan, 'The city as one thing', *Progress in Planning*, 67 (2007), 205–30.

<sup>7</sup>For conceptual and theoretical issues, see the *International Journal of Humanities and Arts Computing*, 3:1–2 (2009) largely devoted to HGIS with several papers on 'Is GIS changing historical scholarship?'. See also B. Hillier, 'The architecture of the urban object', *Ekistics*, 334–5 (1989), 5–21; J. Corrigan, D.J. Bodenhamer and T.M. Harris, 'The spatial humanities: GIS and the future of humanities scholarship', White Paper to the National Science Foundation, no. 163 (2011), [www.nsf.gov/sbe/sbe\\_2020/2020\\_pdfs/Corrigan\\_John\\_163.pdf](http://www.nsf.gov/sbe/sbe_2020/2020_pdfs/Corrigan_John_163.pdf); D.J. Bodenhamer, J. Corrigan and T.M. Harris, *Deep Maps and Spatial Narratives* (Bloomington, 2015); A. von Lünen and C. Travis (eds.), *History and GIS: Epistemologies, Considerations and Reflections* (Dordrecht, 2013), esp. von Lünen, 'Tracking in a new territory: re-imagining GIS for history', 211–39; S. Griffiths and A. von Lünen, 'Preface', in S. Griffiths and A. von Lünen (eds.), *Spatial Cultures: New Perspectives on the Social Morphology of Cities Past and Present* (London, 2016), xx–xxx.

<sup>8</sup>The project EmoMap, based at the Technical University of Vienna, focused on collecting and mapping humans' subjective relations to space using volunteers to obtain geographic information, see: <http://cartography.tuwien.ac.at/emomap/> accessed 27 Dec. 2018. For earlier periods, data could be collected from travelogues and literary sources.

<sup>9</sup>For overviews of the development of the field, and for applications in specific locations, see the Historical GIS Research Network [www.hgis.org.uk/bibliography.htm](http://www.hgis.org.uk/bibliography.htm), accessed 27 Dec. 2018. See also D.A. DeBats and I.N. Gregory (eds.), Special Issue 'Introduction to Historical GIS and the study of

idea – not much more than an informed hunch – the initial spatial distribution obtained in almost any historical context suggests follow-up questions, and revised hypotheses.

Six factors have been instrumental in advancing an understanding of space and spatial relationships. First, the digitizing and georeferencing of historical maps has proceeded with extraordinary pace and provides the basis for plotting historical data series. In Edinburgh, the National Library of Scotland alone has digitized over 180,000 maps. Many other national libraries and individual American and European municipalities have invested heavily in similar initiatives so that instead of being the exclusive domain of specialist researchers and cartographers, the general public is increasingly familiar with – and uses – these cultural assets.<sup>10</sup> Secondly, an ongoing programme to develop open source mapping and tools has released users from the serious limitations of both imprecision as offered by Google maps and expensive proprietary Geographical Information Systems software. This has been complemented, thirdly, by the enhanced autonomy of users through affordable and significantly enhanced desktop graphics and computational capacity. Fourthly, underpinning these advances is the development and deployment of spatial databases.<sup>11</sup> Fifthly, and linked to the spatial databases, it is possible to develop statistical measures of concentration and diffusion, and to do so with a user-defined radius of, say, 500 metres. In other words, the spatial analysis is a staging post to developing further research questions and hypotheses.<sup>12</sup> Finally, sixthly, licensing and reuse arrangements for data have been significantly overhauled since Creative Commons licensing began in 2001.

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urban history', *Social Science History*, 35:4 (2011), 455–63; I.N. Gregory and R.G. Healey, 'Historical GIS: structuring, mapping and analysing geographies of the past', *Progress in Human Geography*, 31 (2007), 638–53; J.R. Logan *et al.*, 'Mapping America in 1880: the urban transition historical GIS project', *Historical Methods*, 44 (2011), 49–60; C. Hochmuth and S. Rau (eds.), *Machträume der frühneuzeitlichen Stadt* (Konstanz, 2006); S. Rau, *Räume der Stadt. Eine Geschichte Lyons 1300–1 800* (Frankfurt am Main, 2014).

<sup>10</sup>See for example:

German 'Geoportal': [www.geoportal.de/DE/Geoportal/geoportal.html?lang=de](http://www.geoportal.de/DE/Geoportal/geoportal.html?lang=de); Library of Congress [www.loc.gov/maps](http://www.loc.gov/maps);




Harvard Library: <http://hcl.harvard.edu/libraries/maps/collections/digital.cfm>;

National Library of Scotland: <https://maps.nls.uk/towns/index.html#edinburgh-city>;

University of Chicago: [www.lib.uchicago.edu/e/collections/maps/mapdigi.html](http://www.lib.uchicago.edu/e/collections/maps/mapdigi.html); New York Public Library: <http://maps.nysl.org/warper/>; Gallica Bibliothèque National de France: <http://gallica.bnf.fr/html/und/cartes/cartes>; Kartenportal Thüringen: <http://web73.server1.justorange.org/index.php?id=422>; Kartenportal Gotha (under construction): <http://web73.server1.justorange.org/index.php?id=463>, accessed 27 Dec. 2018.

<sup>11</sup>See A. Hillier, 'Invitation to mapping: how GIS can facilitate new discoveries in urban and planning history', *Journal of Planning History*, 9 (2010), 122–34; A.K. Knowles, *Placing History: How GIS Is Changing Historical Scholarship* (Redlands, CA, 2008); M.J. De Smith, M. Goodchild and P. Longley, *Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software Tools* (Leicester, 2007), [www.troubador.co.uk/book\\_info.asp?bookid=10](http://www.troubador.co.uk/book_info.asp?bookid=10), accessed 27 Dec. 2018.

<sup>12</sup>S. Rau and O. Zeller, 'Police des voyageurs et hospitalité urbaine à Lyon à la fin du XVIIe siècle', in A. Burkardt (ed.), *Commerce, voyage et expérience religieuse, XVIIe–XVIIIe siècles* (Rennes, 2007), 113–43. In terms of research methods, annual directories used in conjunction with geocoded addresses can achieve clarity on this issue.

			
TYPE OF DATA	Raster only	Raster and Vector	Vector
OPEN LICENCE	No	Only open data products	Yes (ODbL)
DATA REDISTRIBUTION	No	No	Yes (ODbL)
VECTOR QUALITY (ACCURACY)	/	OS MasterMap: excellent (1m)	Good (1-2m) in Edinburgh
SEARCHABLE	Yes but only via Google APIs	Yes but only via GIS	Yes, many tools exist
TOOLS	Only Google APIs	Ad hoc tools have to be developed	Lots of open source tools exist

**Figure 1.** Comparative strengths of different georeferenced based maps  
 Source: Mapping Edinburgh.

A summary of these issues is provided in Figure 1. This compares the strengths and weaknesses of Google, the Ordnance Survey – the national mapping service for the United Kingdom – and OpenStreetMap (OSM).<sup>13</sup> The grid of six characteristics shows the limitations of Google maps compared to others, such as maps.me.<sup>14</sup> A zoomable picture is essentially the basis of Google maps so abstracting cartographic data is not possible. Licensing is restrictive; essentially data superimposed on a Google map belongs to Google, and tools and applications (APIs) developed by Google may be taken down by that company at their discretion. Most national mapping systems are, of course, high quality and generally definitive in terms of searchable content. But the reuse of such data is often limited by licence, and national agencies do not always develop, or at least make publicly available, APIs to facilitate functionality in conjunction with historical data. OSM provides high quality and accuracy, is editable, updatable, inter-operable and managed by a voluntary community of mapping enthusiasts to standards and protocols developed internationally.

This last characteristic, inter-operability, that is, the sharing of data and parameters on an agreed common basis, has important implications for international collaborations and thus for global and transnational urban historical studies. From 2012, OSM data has been made available for reuse under an Open Database Licence (ODbL) which means that users are free to copy, distribute, adapt and transmit OSM data and tools as long as ‘OpenStreetMap and its contributors’ are acknowledged. As for data collected and developed by historians, normally this

<sup>13</sup>National mapping arrangements vary from country to country so this column cannot take account of every circumstance.

<sup>14</sup>See app at <https://maps.me/>.

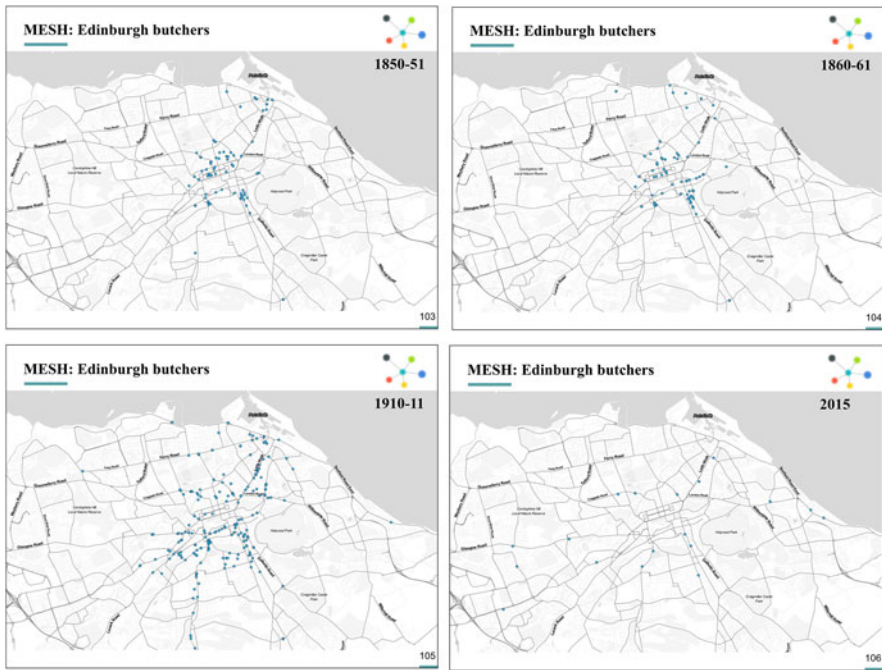


Figure 2. Mapping Edinburgh: butchers  
Source: Mapping Edinburgh.

has been assigned a licence whereby users are permitted to share and modify content freely under Creative Commons Attribution Share-Alike (CC-BY-SA) licence on condition that the creator is credited and that work derived from the creator is made available under ‘the same, similar or a compatible license’.<sup>15</sup>

As a result of these six influences, it is now feasible for urban historians (and others) to move from their own datasets saved in a spreadsheet format to a map showing the spatial distribution of historical series.<sup>16</sup> This might be the location of, say, butchers at a particular moment in time, or over a period of years, as shown in Figure 2, where butchers in Edinburgh are presented for 1850–51, 1860–61, 1910–11 and 2015. The pattern, the spatial relationships of concentration or diffusion, prompts questions, hypotheses and ultimately further research. What spatial patterning exists, if any? Do systems theories contribute to an understanding of the distribution? How should account be taken of the outliers? Is there a dynamic in the sense of change over time, and if so how, *a priori*, might that be hypothesized and tested? Should we be cautious of two-dimensional patterns? How do micro-geographies align, if at all, with general theories? In short, spatial patterning can facilitate a further, deeper understanding of towns and cities, spaces and spatialities.

<sup>15</sup>See <http://opendefinition.org/licenses/cc-by-sa/>, accessed 27 Dec. 2018.

<sup>16</sup>R. Rodger, ‘The facade of power and the power of the façade’, *Urban History*, forthcoming.

### Building capacity: adding value

Three characteristics that all contributors display in this Special Issue are, first, an impressive attention to detail in the original historical source and, secondly, the skill (and concentration) required to transcribe the source into a flexible, searchable form, usually a spreadsheet, as a first stage in the development of a spatial database. Or, as Colson explains, ‘Translating... a historical spatial paradigm into a modern one unlocks a whole range of new insights into spatial patterns, networks and relationships which would not have been feasible to construct using traditional methods.’ A third characteristic deployed by most authors is the development of an integrated data model, that is to say, adding information from one dataset to another because they share a common element – for example, an address. This enriches and extends the utility of the original dataset.

A sympathetic approach towards the historical source might seem self-evidently part of all historical scholarship but in dealing with property deeds, tax records, wills, court cases of various types, a painstaking, consistent, robust methodology is essential when functional descriptions are to be converted into fields in a spatial database. With house numbering before 1800 even in Paris and London in a rudimentary state, then attention to topographical or physical identifiers is essential to identify locations.<sup>17</sup> In Edinburgh, *Williamson’s Directory* of 1773 commonly used such terms as ‘opposite the Luckenbooth’ and ‘at the foot of Nidderly Wynd’. These and similar spatially contextual references – ‘adjacent to’ and ‘behind’ – require accuracy and consistency to translate them into a robust set of spatial co-ordinates (latitude and longitude). Visual cues need to be deployed with great care yet the productivity is high, as Colson shows in his study of legal documents since networks, social status and social relationships are then revealed. Colson unlocks vernacular spatial descriptions of buildings through symbols and signs, and topographical characteristics used in documents from late medieval and early modern London, and converts these into GIS compatible co-ordinates in a sympathetic way. Because legal documents commonly describe a neighbour’s abutting properties, Colson is able to sequence buildings along the street. Such an approach is directly linked to spatial relationships through the purposes of the documentary record. The result is to breathe new life, to add value, into well-known historical documents, and facilitate new insights into spatial patterns, networks and relationships.

Meticulous transcription is a characteristic that all contributors to the Special Issue display in their various historical contexts. Lelo’s cadastral map of early nineteenth-century Rome, for example, was intended originally as an inventory of property. Lelo reconstructs two surveys of Roman property parcels dating from between 1818 and 1823. By combining the two surveys using a data integration method, Lelo illustrates the power of spatial databases by obtaining a quantum

<sup>17</sup>On house numbering, see the Special Section in *Urban History*, 39:4 (2012), 607–79; R.S. Rose-Redwood, ‘Indexing the great ledger of the community: urban house numbering, city directories, and the production of spatial legibility’, *Journal of Historical Geography*, 34 (2008), 286–89, briefly instances examples of European early house numbering practices; P. Laxton, ‘Richard Horwood’s Plan of London: a guide to editions and variants, 1792–1819’, *London Topographical Record*, 26 (1990), 214–63, shows limited house numbering in 1792.

increase of usable information from the two separate property lists. This patient accumulation and classification of property data provides comparable data on a city-wide and district basis by type, size and use of property; social status of owners; and estimated property values which are used by proxy as indicators of wealth. The resulting maps provide a highly detailed and nuanced understanding of property relationships in early nineteenth-century Rome.

März's study, like those of Colson and Lelo, utilizes both a land use and a property survey, in this case for Brunswick Weser. In another extraordinary feat of transcription and astonishing precision in terms of the detailed representations of fields, crops and land use generally, März concludes, perhaps surprisingly, that the boundaries between rural and urban were increasingly dissolved in the course of the eighteenth century. The Brunswick Land Survey was carried out between 1746 and 1773 with the initial aim to revise the land registry which formed the basis for local taxation. März's achievement, like that of Lelo, is to fuse two sources: a detailed, richly annotated historical map with a series of registers that contain highly detailed material on plots, land use, livestock numbers, condition of buildings, occupation and other socio-economic data. These sources provide the two essential features of historical GIS – spatial details linked to factual accounts of the area. The process is described in considerable detail and the results lead the author to conclude that local factors within the community, together with exogenous developments, combined to dissolve urban and rural boundaries.

In each case – Colson, Lelo and März – land value and property records provided a critical element to an understanding of socio-economic forms and spatial relationships. Much the same might be argued for Noizet's study of the long-run morphological character of Paris. The difference is one of agency – religious foundations in the case of Paris. Here, again, the importance of land as the basis of wealth echoes the studies in Rome, London and Brunswick. What Noizet shows is that a difference in monastic orders – between those absorbed in a life of prayer and contemplation and others in more secular orders that ministered to their parishioners in the community – produced a corresponding divergence in land use that centuries later profoundly influenced Parisian street patterns and block densities on the church's urban estates. Evidence is drawn from four foundations: St-Germain-l'Auxerrois, St-Martin-des-Champs, St-Victor and Ste-Geneviève. The more secular the church (St-Germain, Ste-Geneviève) the more densely packed were the streets and blocks – in 1300, five times more so than for contemplative orders (St-Victor, St-Martin). The same pattern, if not quite so strong, applied in 1836. The ability to manipulate the database and to map the resulting distributions and statistical results provides conclusions unattainable by other methods of analysis.

Noizet's study necessitated identifying and calculating the extent of monastic lands in the Middle Ages and relating these to the built-up areas of the same monastic lands at a more recent point in time. This was data integration of a different type but generated with the same intent: to add value and enrich the interpretive possibilities of the original manuscript sources. So, too, Baics' use of New York Public Library fire insurance maps of 1852–54 which provide a fine-grain analysis of urban land use based on property footprints. This HGIS environment of over 60,000 geocoded home and business addresses in the New York city directory for 1854 permitted a taxonomy of residential, industrial and commercial



uses to be developed. The analysis confirmed the familiar story of the separation of work and home for white-collar and artisan classes and the development of elite neighbourhoods further afield which contrasted with the congested immigrant communities in central wards. However, HGIS also allowed Baics to move beyond descriptive spatial accounts to explore the meaning of proximity and distance in mid-nineteenth-century New York. That is, the spatial analysis added value by exploring spatiality – or the way space was used in the form of relationships of space. What did it mean to live far enough from industry, nuisances and high-risk, disease-ridden environments? How did residents in different social strata resolve the problem of where to live, and how to avoid undesirable and unhealthy neighbourhoods? Baics discovers a ‘bid-rent’ preference schedule between work and residential locations in which convenience and cost are counterposed. Finally, the parameters of the trade-off between cost and convenience were transformed in New York by the introduction of commuting by omnibus and it was this, according to Baics’ study, that contributed to the development of residential enclaves and concentrated slum poverty. In some respects, Baics’ study confirms pre-existing research, but it goes far beyond the generalized accounts of residential and occupational patterns to provide a finely tuned behavioural model based on thousands of data items, manipulated with statistical tools.

Building something new, durable and reusable is an important common denominator amongst the contributors to this Special Issue of *Urban History*. Each has invested heavily in the historical source itself. Whether using manuscript sources or printed directories, each researcher has patiently built the historical infrastructure upon which their spatial analysis depends. As noted already, Lelo, Colson, Noizet, März and Baics each display such virtues, as do Gauthiez, and Griffiths and Vaughan. Gauthiez, too, in a different temporal and cultural context, eighteenth- and nineteenth-century Lyons, has built an historical GIS of the city based on the precise identification of urban spaces associated with the silk industry – a major economic activity in early modern Lyons. The HGIS has then been used as an analytical tool to study the changing spatial configurations of the silk industry (locations of weavers, masters, merchants, bankers and foreign agents) from the eighteenth to the mid-nineteenth century. The result is not only a long-run view of the spatial locations and shifts in this important industry but also an illuminating insight into political decision-making with reference to socio-economic development in urban space.

By contrast, Griffiths and Vaughan appear as advocates of historical maps rather than as creators of HGIS maps. Instead, they used DepthmapX, an open source spatial network analysis software tool, available through University College London, and the Space Syntax Laboratory there.<sup>18</sup> In a sense, they are also critics of GIS mapping in this Special Issue. They argue that while HGIS is useful for spatial analysis and the visualization of historical data, it still is not able adequately to link urban materiality with the sociality of space. In order to compensate for this, Griffiths and Vaughan promote a syntactic analysis of cartographic representation. As non-discursive sources, maps help in generating spatio-morphological descriptions starting with a description of built forms and their materiality and arriving at

<sup>18</sup>URL: <http://varoudis.github.io/depthmapX/>, accessed 30 Dec. 2018.

the historical social meaning. According to the two authors, and using examples from nineteenth-century British cities, space syntax should be a serious tool in analysing historical spaces, spatial relations and movements in urban space.

### Urban spatial futures

It is now possible through the analysis of space and spatial relationships to understand not just the *city* – but the *urban*. That is to say, the fine grain of socio-economic characteristics and the way they interact and align through relationships of space (or spatialities). This complements urban relationships developed along lines of gender, skill, age and status. The study of the *city as a space* can be understood through a nuanced account of the *urban as a process*<sup>19</sup> or as a *configuration of spaces* which are conceived, perceived and lived (according to Lefebvre).<sup>20</sup> The adjectival *urban* has been revised from a supportive or descriptive role – urban politics, urban crime, urban education – to an active agent in its own right through a conjunction of urban space and spatial relationships. City-wide and micro-scale analysis, therefore, work in tandem to inform urban spatial relationships.

There is a methodological dilemma at present. Can the historian adopt the scientific method of the engineer or even the *ad hoc* approach of the ‘bricoleur’ or handyman prepared to adopt and adapt such tools as are available to advance understanding of space and the syntactical relationships of space?<sup>21</sup> Stress has been placed on the historian’s craft of skilfully interpreting and representing documentary data. This is a given. Yet so much depends on the HGIS skills of a sensitive computer specialist and statistician in order to derive maximum productivity from the historian’s efforts. It seems unlikely that the engineer can learn the historian’s craft, but no more unlikely than the historian turns computer scientist. Future urban agendas surely must focus on teamwork. How that ‘marriage’ is achieved seems uncertain at the moment yet the potential productivity in terms of urban historical scholarship is immense. Lelo and Baics explicitly acknowledge significant computer-aided support, and it might be worthwhile to ask how such partnerships have been forged and to discuss how they can be replicated.

Another agenda item concerns libraries. Is there an appetite to create, and share, libraries of computer code and libraries of administrative boundaries? These are intellectual assets that significantly enhance and accelerate efforts in terms of urban spatial history. The complexity of boundaries has already been noted, and a repository of these historical lines in an accessible file format would assist future researchers.<sup>22</sup> Of course, a library of urban boundaries (as shape files) is unique to a particular place. Yet a suite of five or ten standard boundary types (political wards; sanitary districts; civil registration districts; regional assembly constituencies; court jurisdictions; transport authorities’ parishes) and how they changed over time

<sup>19</sup>J.W.R. Whitehand (ed.), *The Urban Landscape: Historical Development and Management. Papers by M.R.G. Conzen* (London, 1981); M.P. Conzen, *Thinking about Urban Forms. Papers on Urban Morphology 1932–1998* (Bern, 2004).

<sup>20</sup>Exemplified by the case of the history of Lyons. See S. Rau, *Räume der Stadt. Eine Geschichte Lyons 1300–1800* (Frankfurt am Main, 2014).

<sup>21</sup>A. von Lünen, ‘Tracking in a new territory’, in von Lünen and Travis (eds.), *History and GIS*, 234–7.

<sup>22</sup>B.N. Vis, *Cities Made of Boundaries. Mapping Social Life in Urban Form* (London, 2018).

would represent a significant investment for future researchers. We should not have to invent the wheel every time research on a particular urban site is under consideration.

As noted previously, boundaries are identified with authority and in many cases the administrative responsibilities noted above reside with local government agencies – whatever that might be called in our various countries. So pressure on these official agencies to do two things would be beneficial. First, to urge officials to use OSM as standard so that there is a degree of interchangeability between cities, regions and countries. OSM offers a way forward in terms of standards and cartographic symbology. Secondly, to ensure that officialdom publishes all non-personally identifiable data as part of open access, and to do so in downloadable file formats that can be easily imported to, say, Excel or an equivalent. This would foster interoperability at the local level.

Such measures are essential to future proof research downstream. A digital record and preservation strategy is essential since the wealth of written records that informs historical research in earlier periods is no longer part of administrative practice. Resourcing local archives to address the management of the digital deluge from local government and other public bodies is vital if it is to be possible to write urban histories of the twenty-first century. Curating the urban history of the future through the archives is an urgent item on the urban agenda.

Public history may be critical to the process of integrating public information and digital data. Suppose all planning applications were available online, and they and the official decision was transmitted automatically to a planning database in the archives, then not only could the OSM be updated automatically as new buildings or alterations and additions were approved, but the same was applied to licences of various kinds. Even the floor layouts of stores would be informative to future researchers in relation to the behavioural patterns of customers. The supermarket store layout or the factory production line have a spatial logic in which the floor plan constrains – and manipulates – human behaviour.<sup>23</sup> It defines workplace relations hierarchically, liberating the shop floor supervisor to walk around while trapping the store cashier at the till. The floor layout also conditions customers, providing comfort through familiarity while optimizing space, and profit per square metre. Customers each optimize their time by developing personal routes around the store to achieve their purpose. In other words: the plan on which spatial relations is based, implicitly to some and explicitly to others, is designed to condition social relations and behaviours. Given the complexity of urban administrative boundaries, more attention to systems management would be helpful to a historical understanding of urban spaces and places.

### A credo?

The themes and methods of urban history, social history, planning and the built environment can be brought together, therefore, through mapping spaces and

<sup>23</sup>P. Joyce, *The Rule of Freedom: Liberalism and the Modern City* (London, 2003), 20–61; A. Feintuck, 'Constructing cartographic authority: the conceptualization and mapping of urban spaces in Edinburgh c. 1880 – c. 1920', *Urban History*, 46 (2019), 464–92.

understanding spatial relationships without privileging one discipline to the detriment of others. The common denominator of space facilitates comparative urban research at different scales of analysis by fusing how the physical environment is constructed with what the everyday inhabited spaces mean to a spectrum of interested parties. The material of the city and its many meanings may never be perfectly in alignment, and so educated inference is unlikely to disappear, but mapping techniques, data collection and processing and the analytical tools now available allow more of us to make headway in understanding the urban. Spaces cannot be understood without places nor places without spaces.

The authors in this Special Issue of *Urban History* contribute to this realignment of space and place, city and urban. Each author in different ways illustrates and illuminates facets of space and spatial relationships in towns and cities, sometimes including peri-urban areas, and does so in fundamentally different historical settings. Power, markets, systems of belief and belonging are amongst other themes re-presented through patterns and uses of space. Their spatial and temporal analyses range from the ninth century to the present in world cities – Paris, Rome, London, Lyons and New York – and in smaller north German settlements. Issues of proximity – the conception of ‘near’ and ‘far’ and how that determines location – are shown to contribute to an understanding of behaviour in different historical settings. The enduring impact of property ownership on the morphology of contemporary cities is another theme that emerges and links across the contributions to demonstrate the wider significance of institutions over time in terms of property ownership and urban morphology. The visualizations of data are truly remarkable for their sheer labour in constructing the underlying maps from which the analysis, interpretation and, in some cases, statistical conclusions flow. Their insights, reinterpretations and visualizations should inspire us all, and re-energizes an old question: what is urban history?<sup>24</sup> Perhaps their collective answer is: the study of the *city as a space* can now be more fully understood by a more nuanced account of the *city as a changing configuration of places* or the *urban as a process*.

**Supplementary material.** The supplementary material for this article can be found at <https://doi.org/10.1017/S0963926820000218>.

<sup>24</sup>H. Jansen, ‘Wrestling with the angel: on problems of definition in urban historiography’, *Urban History*, 23 (1996), 277–99; M.B. Katz, ‘From urban as site to urban as place: reflections on (almost) a half century in U.S. urban history’, *Journal of Urban History*, 41 (2015), 560–6, and further contributions in the same issue by L.H. Lees, T. Gilfoyle and N.D.B. Connolly; M.B. Katz, ‘The existential problem of urban studies’, *Dissent*, 57 (2010), 66–7; R. Rodger, ‘In pursuit of the indefinable? The urban variable reconsidered’, in S. Supphellen (ed.), *The Norwegian Tradition in a European Context* (Trondheim, 1998), 47–56; S. Ewen, *What Is Urban History?* (Cambridge, 2016), provides an overview of the topic. M. Storper and A.J. Scott, ‘Current debates in urban theory: a critical assessment’, *Urban Studies*, 53 (2016), 1114–36, provide a provocative approach to studying the urban in a contemporary setting. The authors in J.-L. Fray *et al.* (eds.), *Urban Spaces and the Complexity of Cities* (Cologne *et al.*, 2018), see cities through their different spaces.

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