

spatial questions

cultural topologies and social spatialisations

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The ill-defined concept of ‘space’ itself presents an immediate problem. ‘What space is’ is of universal social interest and the topic of some of the most historic knowledge projects and texts produced by human cultures. How is space known? How might we take stock of our spatial knowledges, placemaking and spatial practices across cultures? What are the elements of a topology of space? If history and geography have a descriptive bias, a genealogy of space would go in a different direction, attempting to avoid describing within an unquestioned framework, while critically exposing the conditions for discourses on space and the framing effect of spaces. A ‘critical topology’ might take this even further, to ask how different formations or orders of spacing might coexist and not succeed but modify or warp each other. Borrowing from the insights of mathematics and theoretical physics, it would deploy a spatial method: a dynamic, set-based and topological rather than stratified approach. This book develops a ‘cultural topology’ as a critical theory and method for social science and geography by considering the recurrent quality of orders of spacing and placing – what I will call ‘spatialisations’. These will be presented as ‘virtualities’: intangible but real entities. Cultural cases, including the history of philosophies of space, will be used to illustrate the diversity of social spatialisations and their impacts. This chapter introduces social spatialisations by considering two historical cases, as presented in the ancient Chinese text, the *Shan Hai Jing*, and in the *Kitab Nuzhat*, an encyclopaedic atlas produced for Roger II of Sicily in the first half of the 1100s.

From the *Shan Hai Jing* to Herodotus’ *Historiae* and to Idrisi’s *Kitab Nuzhat*

The first geographers are mythographers then travellers; their books are histories then atlases. One of the first books, *Shan Hai Jing*, or *The Guide to the Ways through Mountains and Seas*, is a perfect illustration (P’o Kuo (Guo Pu), 1985). As a text it pre-dates not only books but printing. Though

misinterpreted and embellished as a mythology by later generations, it was originally a book of geography describing the character of regions at the edges of the Zhou Dynasty empire (approx 1046–771 BCE) although elements are said to date from the first Hsia dynasty (twenty-second century BCE). Historians divide the text into a core ‘Classic of Mountains’ (*Shan Jing*) and later sections, ‘The Classic of Seas’ (*Hai Jing*) and ‘Classic of Great Wastes’ (*Da Huang Jing*). Divided into short passages, each entry describes locations grouped in geographical areas to present a comprehensive account of the world as the Warring States and the Han knew it. However, the places discussed are never sites of everyday life but mountains and distant regions where strange races and monsters dwell. They are metaphors of unknown hinterlands, the sorts of liminal zones discussed in *Places on the Margin* (Shields, 1991), and frontiers where social and cosmological order breaks down. Divinities, strange plants and hybrid beings populate an atlas of ‘interfaces between the animal, the human and the divine’ (Lewis, 2006: 285).

As a result, such writers as Sima Qian and Ban Gu¹ dismissed the work as nonsense. In the earliest catalogue of Chinese texts it was classified under the section ‘Calculations and [Mantic] Arts,’ under the subcategory of ‘Methods of Forms’ (*xing fa* ...) This category contains books on the physiognomy of men and animals as well as early examples of what would evolve into the science of environmental influence known as *feng shui*. The classification thus indicates that the *Shan hai jing* was viewed as a manual for divination based on the physical shape of the world ... It may also reflect the fact that the text contains numerous accounts of natural prodigies and what they foretold.

In the twentieth century, the work was treated as a geography, a compendium of myths, an early ethnohistory, and a set of labels for lost illustrations [or maps]. A large literature has also attempted to gloss the places mentioned with modern or historical names. (Lewis, 2006: 285)

Spanning recorded history and the history of printed books, commentaries on *Shan Hai Jing* mirror change in successive dynasties (see Figure 1.1). Its classification changed in Chinese historiography between travelogue, strategic guide, bestiary and mythology, depending on the extent to which it was found to be useful to the Imperial court as an empirical reference in dealing with neighbours, its peripheries and foreign contacts. These included trade routes such as the Silk Road connecting China with the Middle East and Europe. Contemporary Chinese scholarship understands the text critically as a document dictating Imperial rituals binding

the regions of Ancient China together. At the same time in contemporary China mountain parks and temples such as Wu Tai Shan (a key site in Buddhism) are being rediscovered as tourist and pilgrimage destinations for Chinese citizens.

Following Dorofeeva-Lichtman, Lewis argues that none of these classifications exactly capture the basic nature of the text as a cosmology which assigns every being and even ancient legend to a place in a sacred geography (Dorofeeva-Lichtmann, 1995).

The *Shan hai jing*, despite the impression given by the exact distances between sites, does not depict the world's physical form. Instead it is a 'conceptual organisation of space' conveying fundamental ideals about the world through its overarching schema ... the world [and cosmos] is square, oriented in the cardinal directions, balanced if not symmetrical ... and clearly distinguished between centre and periphery ... in which there is a progressive decline as one moves away from the centre through a series of concentric squares. (Lewis, 2006: 285)

Mountains in the *Shan Jing* are interfaces to the divine, distant seas of the *Hai Jing* are uncanny regions of strange beings 'separated from the centre in both space and time' (Lewis 2006: 285). History and geography are integrated into an atlas. The *Shan Hai Jing* is also a text integrated into the cults and politics of its time. Mountains are interfacial, in-between sites of spiritual potency where celestial and hybrid beings are expected. Distance equates with barbarism signalled by the monstrosity of the peoples. As Lewis notes, 'remoteness ... became part of an ideology of power' (Lewis, 2006: 301). Peripheries are conflated with primitiveness and also with lesser-developed societies in a manner similar to the exoticism of nineteenth- and twentieth-century European ethnology and anthropology. Lewis argues:

the shift toward the horizontal dimension ... focused on the distinction between inner and outer by structuring the earth according to the diverse peoples on its surface rather than the mountain chains that linked it to the sky. This shift away from the vertical is also marked by the abandonment as a structuring principle of the hierarchy from beasts through men to spirits marked by the relations of consumption and feeding. Instead it emphasized ... beings sharing a common nature varied across space through the influence of custom. (Lewis, 2006: 295)

The *Hai Jing* and *Da Huang Jing* look not upward but outward to exotic peripheries. In part, the horizontal structure of the later sections coincides with the shift of attention to their borders and beyond by an expansive Han dynasty. However, these accounts are not detailed,² but

serve the self-definition of the Chinese (a strategy used throughout history (Lewis, 2006: 297)):

There is the state of the Zhi people. The god Shun sired Wuyin, who descended to the land of the Zhi. They are called the Shaman Zhi people. The Shaman Zhi people are surnamed Fen. They eat grain. They wear clothes that are not woven or sewn, and eat food that they do not plant or harvest. Here there are birds which sing and dance; simurghs that spontaneously sing and phoenixes that spontaneously dance. All varieties of four-legged creatures assemble here, and all types of grain can be gathered. (Lewis, 2006: 299)

This is also a processual itinerary similar to even more ancient Chinese legends such as the *Yu Gong*. As noted above, these texts are a prescription and model for the performance of actions that organise space (Lewis, 2006: 286), situating the reader and providing the basis for efficacious, strategic action. This is similar to annual royal processions of ancient Chinese rulers, ritual visits to mark sovereignty by making sacrifices on specific mountain tops, and seasonal duties in temple complexes which were followed as a means to authority (Lewis, 2006: 286).

Within the overall text known as the *Shan Hai Jing*, the *Shan Jing* is more empirical than the *Hai Jing* or *Wan Jing*. These appear to be written at different times rather than being one manuscript, although it was

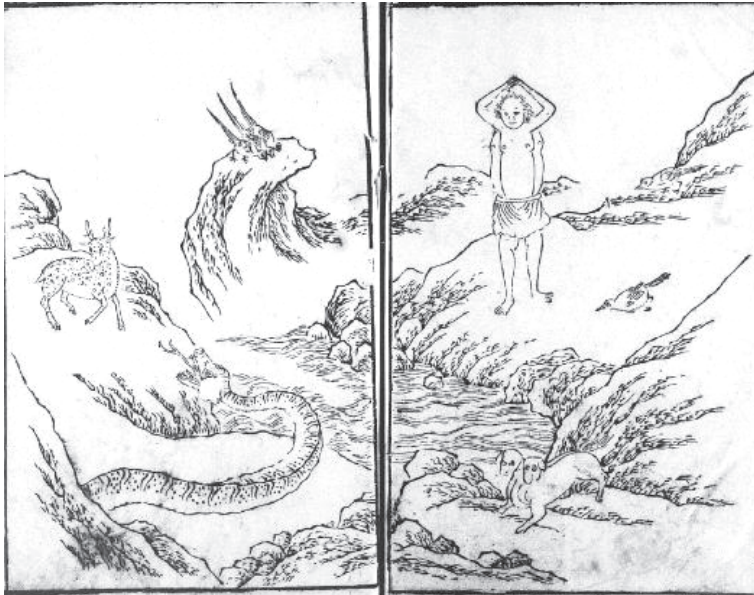


Figure 1.1 Illustration from the *Shan Hai Jing*

in its final form by the time of the Han Dynasty (206 BCE–220 CE). For contemporary Chinese scholars, the text is neither a unitary mythology nor a ‘cosmology’, even if it has been treated as such within China historically and by modern scholars outside of China. Chinese scholars have argued that the entire nature of mythology is different in China compared to Western Europe: it is not as closely articulated with everyday life but treated as an abstraction. It does not represent ‘mainstream’ historical Chinese cultural geography texts (such as the Confucian classics *ShangShu* (*Book of Changes*), *Liji* (*Record of Rites*) or *ShiJing* (*Book of Poetry*). With its changing reception over time, it cannot be used as an atlas or index of historical events. For example, the *Shan Hai Jing* has no mention of Confucius or other historical figures. Nonetheless, the *Shan Hai Jing* provides an example of a text of rituals where the changing reception of the text over time suggests shifting ‘cultures of space’ or spatialisations.

Mediterranean Geographies

Although over 2000 years older, the *Shan Hai Jing* uses the same method as Renaissance and Islamic cosmographies that listed ‘marvels and curiosities under the place they were found and structured the presentation by moving from place to place while locating each site only in terms of the direction and distance from the preceding one’ (Lewis, 2006: 286). While previous theorists of space such as Lefebvre (1991b) have preferred a linear teleology in which one ‘mode of production of space’ (or reified spatialisations) surmounted the previous modes, these texts illustrate the absence of a linear historical development of spatial understanding, where history is full of reversions to older perceptions and never fully refuted conceptions of space. Hand in hand with this heterodoxy goes alternating social practices.

The widely travelled Athenian historian, Herodotus (Bodrum and Athens c.484–c.425 BCE), remarked on Hecataeus of Miletus’ (c.550–c.476 BCE) work *Periegesis* or *Periodos Ges*, ‘*A Voyage Around the World*’. Hecataeus’ world map was structured, like Miletus itself, on pure geometric forms (circles, squares), which influenced how the Earth was understood as a flat plane (Herodotus, 1962 IV: 36). These remarkable maps can be understood as *diagrams* – more like a subway map than the contemporary cartography we are used to. Our Mercator projection may one day be seen as just as distorting a representation as that of Hecataeus. Hipparchus and Ptolemy’s later concepts of latitude and longitude were related in part to an interest in defining *Klimata* – ecologico-ethnological regions (Ptolemy 1969) but became a coordinate structure. Bands of latitude were not only climatic, but were characterised by different flora, fauna and societies including different

racers of humans. This is one of the origins of the idea that a region's inhabitants embody its qualities.

The maps included in the original edition of Ptolemy's *Geography* have been lost. However, that barely matters. The text is absolutely lucid and can be read with profit even today ... Ptolemy's *Geography* was largely forgotten for many years except by a number of Muslim scientists. In Palermo, in the multicultural court of the Norman King Roger II, al-Idrisi (c. 1100–1165 CE) used an Arabic translation of the great work and improved on Ptolemy's calculations. The Greek text was ... not rediscovered until a Byzantine monk, Maximus Planudes (c. 1260–1330 CE), found a manuscript copy without the maps ... This became the basis of the first printed Ptolemy atlas, which was published in Bologna in 1477 in an edition with five hundred copies. Columbus owned a copy and studied it carefully. (O'Shea, 2007: 15)



Figure 1.2 Mappa Mundi from Al Idrisi, *Kitab Nuzhat*, c.1154. This map is from a manuscript copied by Alī ibn Hasan al-Hūfī al-Qāsimī in Cairo in 1456, preserved in the Bodleian Library, Oxford (Mss. Pococke 375 fol. 3v-4). [Public domain, available on Wikimedia.org]

By the twelfth century, *the* most voluminous undertaking of its time with respect to knowledge was another geographical work, Al Idrisi's encyclopaedic *Kitab Nuzhat*³ (Al Idrisi and Sezgin, 1988) commissioned by Roger II of Sicily from a team of famed twelfth-century scholars led by Al Idrisi (Ibn Rushd also known as Averroes). Idrisi is included in Raphael's 'School of Athens' as the turbaned figure on the left (see Figure 3.3). In effect, Roger II's kingdom based in Palermo represented the intersection of feudal Christian and Moorish societies. The *Kitab Nuzhat* built on previous Arab geographical texts and experience but also involved teams that did fieldwork and gathered data. Although this masterwork was unknown in Europe until the sixteenth century, its organisation of research and its presentation as a narrative and cartographic representation of knowledge – including a large circular silver map (destroyed 1160) – were world views which influenced far more than cartographic practice. It inspired European global ambition and probably stories of it inspired Columbus. The *Kitab Nuzhat* anticipated the organisation of strategic state knowledge-enterprises in later centuries, from the Inquisition to the collecting and profiling practices of Napoleonic armies to Royal Commissions and state inquiries of our time.

Spatialisation and Space-Time

Geographies scaffold presuppositions about not only the world but the cosmos. Despite the official hesitation of dictionarians and philosophers, we find an unexpected cornucopia of spatial references embedding space and time in everyday life: elaborate expressions and elegant spatial metaphors. Not surprisingly, what appears to communicate most in slogans, theoretical description and ideological diatribes are precisely spatio-temporal allusions; they place us 'in situ' in innumerable, politicised, socio-spatial/socio-temporal contexts and in partisan relationships to other groups, individuals, objects, social processes and ideas, without necessitating the explicit enunciation of this partisan relationship. They place us in a space in which we are 'to the Left' or 'to the Right' of a political issue, for example, and in a time in which futures are presented before us as consequences of the present, or where we are asked to learn from the past, referring back and forth between tenses. In this, 'space' (and time) evidently plays an important role in knowledge and in knowing the world. It is political. When we turn to our daily speech, read the headlines of our newspapers, scan learned journals, we draw on our experience and understandings of spatiality and temporality.

Conceptions of space are intimately linked to those of time, and are intrinsic in the intellectual ordering of our lives and to our everyday notions of causality and experience. Time-space is very much the stuff of common-sense as well as physics. It spills over into practice. Presuppositions about the broad context we live in – that the world is flat or round, or that time is

directed to a specific, teleological endpoint or simply unfolds as a trail of the present – form actions and responses to situations.

Is space not a cultural artefact in its own right, a socially produced framework which may become a self-fulfilling prophecy by structuring actions? Nearly every philosopher and social thinker has dealt in some way with space or spatiality. However, analysis is further complicated by the intangibility of physical space. It is not a concrete object, but a ‘virtuality’ or set of relations that are real but not actual (see Shields, 2003). ‘Space’ is also translated in different ways (see Chapter 2): engineers conceive of space as a void; physicists, conceive of it mathematically as a set of dimensions (e.g. from two dimensions of a surface up to 11 dimensions in particle physics). And, in the late twentieth century, social scientists began to understand space as a qualitative context situating different behaviours and contending actions as a thoroughly social factor.

However empirical and concrete writers have attempted to be, there has been no consistent historical consensus on the nature of space that would establish an unequivocal philosophical position or a cartographic method once and for all. Statements of the ‘problem of space’ by Aristotle, Euclid, Descartes, Leibniz and Newton, Kant, Hegel, Nietzsche, Husserl, Merleau-Ponty, and Heidegger along with Lefebvre, have marked out entire epochs in the treatment of space. Enlightenment philosophies of space depended on Euclid’s geometry and presumed a three-dimensional *extensio* known through geometry. However, the Aristotelian tradition casts space as a mental category by which objects are named and classified. And by contrast, Kant cogently argues that space is neither cognitive nor subjective (Kant, 1953: 41–51).⁴ Privileging only relations over a geometrical reality involves attributing to space relations that are proper to objects. But if all continuous motions in a three-dimensional space are as real as objects are, not much is saved by denying the reality of space itself. It may not have the tangible actuality of material objects, but it has the ideal reality of a medium, intangible object or social fact (an ideal but real analytical object, similar to mathematical sets, social groups, brands, etc.; see Chapter 3 and 4 and Shields, 2003). At a minimum, space can be successfully argued to be an intangible but substantial bearer of topological properties whose consequences we can notice in ordinary experience (see Chapters 5 and 6).

If this discussion challenges nominalist, commonsensical notions of our spatiality, it remains a problem that classical approaches emphasising three-dimensional space break down in everyday usage as well as in physics and the mathematical modelling of space. Theorists of globalisation speak of ‘space-time compression’ in a routine manner to convey the experience of a shrinking globe, even if it is not actually changing. This is not a mental experiment. It illustrates that we live in a nuanced, changing spatialisation that is certainly distinct from the cosmology of the *Shan Hai Jing*. More

significantly, it is clear that social science orthodoxies of globalisation are not based in a Euclidean space but in a ‘rubber sheet geometry’ of the sort which is only possible in an elastic topological space. This spatialisation is continuously changing – even since Lefebvre, Harvey (1987) and Jameson (1984) described capitalism as an ‘Abstract Space’. The art of Escher demonstrates the paradoxes of mathematical ‘*phase spaces*’ which may have any number of dimensions or may be conventional spaces warped by added factors. These are *topologies* (see Chapter 5) that depict variables as dimensions (thus a simple graph is a two-dimensional space of x and y axes). Physicists and mathematicians envision an infinite number of spaces, all in motion with respect to each other. By early in the twentieth century, the work of Lobachevski (2005) and of Riemann (1854) opened up a relativist plurality of spaces and helped legitimate the possibility that the history of the earth and its discoveries might be construed differently in different sociocultural spaces.

Before these mathematical innovations, non-Euclidean geometry was only encountered in optical illusions and visual parlour tricks. These remain and most people will have experienced the effect of a fish-eye lens on a simple object such as a triangle whose sides balloon and whose angles are similarly distorted. If these were measured with a regular protractor, the angles of the corners would be found to add up to more than 180°. However, in historical examples, one could always remove the lens, revealing the ‘real’ shape to be an unchanged triangle where the sum of its angles always add up to 180°. The fish-eye experience was an adventure into fictional representations of the possible, not the real. The legitimate commitment to exposing the real, rather than representations and ideologies explains nineteenth-century social science rectitude and resistance to the virtual (see Chapters 3 and 4). The twenty-first-century world depends on technologies and mathematical analyses that turn on non-Euclidean spatial modelling (i.e. representations) and on the effects of extra-dimensional phenomena at the subatomic scale where Euclidean norms do not pertain. It is not that we suddenly live in an Escher-like world, but consider that when we speak of globalisation as ‘space-time compression’ we are tarrying with spatialisations and topologies that are neither Euclidean nor illusory. If they have tangible effects, how might we acknowledge this while maintaining our footing in the real world of experience? How might we reflect critically on the nineteenth-century commitments to privilege one 3D spatialisation over all others in the name of truth – the one that social and spatial sciences still maintain? How might we conduct an immanent critique of the language and Euclidean rhetoric of our geography, planning and architecture?

Ever since the development of non-Euclidean geometry, Cartesian absolute space has become just one topological space that describes the human experience of embodiment. Other mathematical topologies may better

describe the social configurations of those bodies in everyday life, the various perceptive and bodily capacities of other species (von Uexküll, 1909), or of wider socioeconomic processes of human populations. We are led to examine alternatives that might more appropriately describe the complexity of global culture than the common sense, Euclidean 'spatialisation'. Here, '*social spatialisation*' is a unity of practice, theory and presuppositions that casts the world as the play of volumes and planes in three, and only three, universal dimensions (see Chapter 2). But in a plurality of spaces, it makes sense to talk of *multiple* simultaneous social spatialisations which could be different and which gain meaning as changing topologies that map affinities between bodies, meanings and sites in time (Mach, 1901: 94; Poincaré, 1952: 50–8). The historicity of social spatialisations shown in the cases of the *Shan Hai Jing* and the *Kitab Nuzhat* continues with the admission of time as a dimension in representations of 'space-time' made by theoretical physicists since the end of the nineteenth century.

At the beginning of the twentieth century, Durkheim audaciously proposed a correspondence between social structure and society's notion of space laying the ground for structural anthropological studies. He provided the example of the Zuñi Indians, concluding that their space was nothing else than, 'the site of the tribe, only indefinitely extended beyond its real limits' (Durkheim and Mauss, 1973: 12). One could venture from reports of Aboriginal conceptions of space as the 'Dreamtime', that landscape can become more than sedimented traces. It can be a historiography, read through embodied presence, perigrination and pilgrimage. This view of social space and place is topological. As social spatialisation, it has an over-dimensioned quality – affect, memory, interaction exceed any 'physical' datum. For example, against my impoverishment as a monadic subject orphaned from my involvement with a material world that is practico-inert, such cultures and practices emphasise qualitative heterogeneity, varying not only from place to place (some being perhaps sacred, others profane); but they are also not locked within one topology: spatialisations are contested within societies or are held and contested by clans. Heterogenous social space must be produced and reproduced as a real and lived, tangible and intangible cultural artefact.

The multiplication of spaces was deeply disturbing to the common-sense mind of the nineteenth century European Left and Right. The implied subjectivity and relativism threatened the stability of objective reality, of what could be taken for granted. Space, it was argued, must 'exist before social groups can be perceived to exhibit in their disposition any spatial relations which may then be applied to the universe; the categories of quantity have to exist in order that an individual mind shall ever recognize one, the many, and the totality of the division of his society' (R. Needham, 'Preface', in Durkheim, 1976: xxvii). The reduction of 'social space' to 'physical space' re-aligned late twentieth-century social

science with early nineteenth-century natural sciences. This was crucial to the nineteenth-century achievement of a homogenous spatialisation allowing and legitimating the power practices of an expansive European imperialism (Lefebvre, 1991a).

Piaget's experimental research challenged the Kantian assertion that space and time are *a priori* modes of conception:

space is not the vague and indeterminate medium which Kant imagined; if purely and absolutely homogeneous, it would be of no use, and could not be grasped by the mind. Spatial representation consists essentially in a primary coordination of the data of sensuous experience. But this co-ordination would be impossible if the parts of space were qualitatively equivalent ... To dispose things spatially there must be a possibility of placing them differently, of putting some at the right, others at the left, these above, those below, at the north of or at the south of ... space could not be what it is if it were not, like time, divided and differentiated ... All these distinctions evidently come from the fact that different sympathetic values have been attributed to various regions ... and that almost necessarily implies that they be of social origin. (Durkheim, 1976: 11)

Knowledges of 'space' are part of social and cultural processes. Yet social space is not just a cognitive mapping (cf. Lynch, 1956). It cannot be derived entirely from forms of social solidarity. This would render space entirely cultural, whereas some aspects of spatial experience and embodied interaction are neuropsychological (such as the optical reversal of left and right in mirror images), dependent on mathematical laws of topology and on physical forces (see Chapter 5). How might one understand conflicts over social space or the production of '*counter-spaces*' of resistance and reversal of the dominant spatial logic? The concept was introduced by Lefebvre (1991a: 381–2; see Harvey, 1987) to help understand juxtapositions within social space and nested spaces within spaces in which very different rules apply (cf. Jameson, 1984).

In the late 1960s, Lefebvre turned Durkheim's hypothesis of countless social spaces back on the West to consider class struggles over the organisation and meaning of space. What are the relations masked and who is disadvantaged by the spatial common sense of a Cartesian absolute, *a priori* and ineffable 'social space'? Is this contradictory and paradoxical structure not a type of cultural 'signature' of a dominant technocratic and capitalist social spatialisation? This made social space appear to be a homogeneous, smooth order. 'Distance' became its most important feature. Rigorous discussions of the spatialisation of this system were marginalized, though influential writers of the first half of the twentieth century had prioritised the geographical expansion of capitalism as an imperialistic 'fix' for

systemic contradictions and inefficiencies. The importance of non-Euclidean mathematical spaces in science set the stage for late twentieth-century re-appreciations of social space. We need to know about ‘spacing’ and the spatialisations that are accomplished through everyday activities, representations and rituals. How is space not just about distance between elements but an order of difference that is heterogeneous and unfolds temporally. This book asks, how is this spatialisation changing, not simply in the truisms of a shrinking world but in the sense of new digital dimensions of the internet, social software, GPS and spatial data that change the qualities and functionalities of specific places and spaces?

The Argument of this Book

The argument presented over the course of a review of the nature of space as spatialisation and the history of theories and cultural representations of space, is that we require a set of theoretical tools to analyse multiple spatialisations at the same time. We need to be able to also analyse these as time-spaces: flows of matter, time and energy, not to mention interests, ideas and bodies. This toolset is provisionally referred to as *cultural topology*. We need to be able to work with our everyday three-dimensional interactive environment, at the same time as understanding what new media theorists have called an ‘augmented reality’ of digital representations and wider so-called ‘spaces of flows’. Non-propinquitous communities of practice and networks of influence and inscription have material effects. These are not merely socially constructed but will be argued to be real if not actual or tangible to the body. Other space-times, other dimensions enter the sensorium of the local. Explanations that cast situations predominantly in one sole spatialisation are doomed to incompleteness. We need to seek the topological coordination and entraining of multiple spatialisations around situations or events, futures and pasts.

Notes

- 1 Sima Qian (c.145 or 135 BCE–86 BCE) was one of the founders of Chinese history. His history covered more than 2000 years of early China, based on fieldwork and travels to verify myths. Ban Gu’s (32–92 CE) geographical history influenced later gazetteers and geographies of China.
- 2 Unlike some other Han writings such as Chao Cuo’s (c.200–154 BCE) memoir that compares and contrasts northern and southern people in a human geography which might rival that of Herodotus: ‘The land of the northern barbarians is a place of accumulated darkness. The tree bark grows three inches thick, and the ice pack is six feet deep ... The people are compact and solid, while the birds and beasts have down and dense hair, so by nature they can endure the cold. ... To provide clothing and food the northern barbarians are not

attached to the ground, so their circumstances are conducive to causing disorder at the frontier. How can I prove this? The northern barbarians eat meat and drink milk fermented. They wear leather and skins. They have no settled abode inside city walls or in dwellings in the fields, so they are like flying birds or running beasts in the vast wilds. When there is excellent grass and fresh water they stop ...' (Lewis, 2006: 298).

- 3 *Kitab nuzbat al-mushtaq fi ikhtiraq al-afaq* (The Recreation for Him Who Wishes to Travel Through the Countries) by Idrisi Muhammad ibn Abd al-Aziz c.1150CE.
- 4 See histories of philosophical definitions of space such as Koyré's cosmology *From the Closed World to the Infinite Universe* (1957), Căpek's history of 'space' as used in mathematics and physics, *The Impact of Physics on Philosophy* (1976), and surveys of 'space' as used in the social sciences in Kolaja's *Social System and Time and Space* (1969) and Sack's *Conceptions of Space in the Social Sciences* (1980).

