For some years now, there have been signs of heritage protection merging with planning and architecture at large. This is seen in the philosophy and practice of 'constructive conservation' (for example, English Heritage, 2008). To a growing extent, heritage protection is less about trying to 'save' individual buildings and monuments, and more about working out how to change places in ways that respect and draw on their historical patterns, while also accepting that places must grow and develop to meet future needs.

The morphology of towns and cities is fundamental to appreciating their overall character. The wide concept of 'historic environment', along with the emphasis placed by the NPPF on character and the obvious contribution that map-based historical characterization can make to master-planning, are now important components of the overall approach to managing change in the built environment. Does this context provide a new opportunity for urban morphology to play a fuller role in the conservation debate? Understanding the form of places, how that form has developed, and what its historical significance is, should be an important part of this broadened vision of conservation. This should give great scope for the geographically-oriented practitioners of urban morphology to make a real contribution to discussions about the future planning and conservation of our towns and cities.

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The origins of urban rectangular plans in the Near East

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Recent research on prehistoric village sites along the Middle Euphrates River between Aleppo and Raqqa in Syria has shed considerable light on the origins of rectangular settlement plans in the Near East. Based on evidence from proto-urban sites dating from the Pre-Pottery Neolithic period in the ninth and eighth millenia BC, Edwards (2016) posits that the innovation of right-angled straight-lined building walls can be found at key Neolithic sites, such as Mureybet, flooded by Lake Assad from the Tabqa Dam in 1976. Here the transition from circular and oval subterranean building plans to fully rectangular ground plans can be dated as having taken place after 9000 BC in a period of warmer climate during which the transition occurred from sedentary hunting and

gathering sites to fully domesticated agricultural villages.

The site of Mureybet on the east bank of the Euphrates River was first discovered in 1964 by M. van Loon (1968) as part of a UNESCO survey of the Middle Euphrates valley that was to be flooded by creation of the Tabqa Dam. The initial radiocarbon archaeology dated the circular plan to 8445 BC and the later rectangular walled plans to 8300 BC, indicating a rapid transition during the mid-ninth millenium BC. A subsequent survey by J. Cauvin before the final flooding, revealed a crucial site at Building 47 (Ibáñez, 2008). Here the circular subterranean plan was internally subdivided by straight-lined packed mud walls into individual cells, probably used for storage. This innovative feature of storage cells has been dated to 9100–8600 BC, firmly part of the early subterranean site. The transition to fully realized aboveground rectangular walled construction for storage rooms made of cut limestone blocks is now dated at 8400 BC. The tight dating between 8600 and 8400 BC indicates the rapid shift from circular to square layouts, probably for the purpose of surplus agricultural storage, in about 8500 BC.

Two other related sites on the Euphrates were discovered in the 1980s with the flooding of the Thisrin Dam above Lake Assad. The most notable was Jerf el Amhar, founded in about 9500 BC on the right bank upstream from Mureybet as a village with round subterranean houses lined with stones (Ackremans and Schwartz, 2003). Beginning in *c*. 9100–8600 BC, the interiors were divided by straight-lined packed mud walls, probably used for storage, and having a similar plan to Mureybet. The other related site is Abu Hureyra on the left bank downstream from Mureybet, also founded in about 9500 BC (Moore *et al*., 2000). Later occupation, after 8000 BC, displayed a plan of rectangular houses of fully formed mud-brick construction. Such Neolithic rectangular mud-brick forms have been discussed by Love (2013) in her study of building forms of the Pre-Pottery Neolithic period in the Levant and Anatolia. Her analysis dates the change of plan from stone-lined circular to mud-brick rectangular in Anatolia as having occurred after 8000 BC. This matches developments on the Middle Euphrates in Syria.

Among the crucial factors that encouraged the innovation of development along the Middle Euphrates was the acquisition of sharp-edged obsidian rock from volcanic sources in Cappadocia, Turkey, which replaced local flint as the preferred cutting tools for wood and leather (Ibáñez *et al*., 2016). The trade in volcanic obsidian to Turkey extended the innovation of rectangular urban plans into Anatolia and established the multi-plan form of large fully rectangular ground plans, as in the classic case of Çatalhöyük in *c*. 6500 BC (Krim, 2014). To the south, the rectangular village plans of the Middle Euphrates diffused back into the Jordan Valley where earlier circular villages had been established in the tenth millennium BC. Edwards (2016) has shown that the change from circular to rectangular plans can be traced to Jordan Valley sites at Motza (Israel) and Beidha (Jordan) by 8300 BC. This change is also seen in the historic site of Jericho with its famous round stone tower of 8300 BC (Mellaart, 1975).

It is evident that the origins of rectangular plans can now be traced back to some 11 000 years ago in the early stages of adjustment from hunting and gathering camp sites to fully realized domesticated agricultural villages in the Pre-Pottery Neolithic period. Specifically, the innovation of right-angled urban plans appears to occur in the Middle Euphrates Valley of Syria between 9000 and 8500 BC, possibly stimulated by the trading of volcanic obsidian from Anatolia. Ironically most of the key early sites at Mureybet, Jerf el Ahmar and Abu Hureyra have now been lost as a consequence of the flooding of the Tabqa and Tishrin dams in Syria, with further sites now inaccessible owing to the continuing civil war. However, the time depth of rectangular plans in the Middle Euphrates can now be more fully appreciated. The origins of rectangular urban plans beyond the Near East, notably in central China, Meso-America and Andean Peru, are still open for investigation.

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Reflections on 'How we view cities: a green-space enigma?'

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In his thought-provoking editorial, Whitehand (2017) mentions two particular omissions that are highlighted when the position of green space in studies of urban areas is considered. The first is the focus by many urban morphologists, particularly Western urban morphologists, on the form of buildings at the expense of the spaces that they occupy. The second is the often limited way in which different types of green space are distinguished in studies of urban areas based in the biosciences. To these could be added a third: the very infrequent consideration of green spaces and vegetation, particularly trees, as contributors to urban landscape character. Identifying and addressing these omissions could provide opportunities for deepening urban morphological studies, developing interdisciplinary communication and bridging the gap between research and practice.

One possible means of tackling these omissions could be to develop links between the historical framework of study provided by urban morphology and the functional, planning framework provided by the concept of green infrastructure. Green infrastructure has been defined as a 'network of high quality natural and semi-natural areas with other environmental features, which is designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings' (European Commission, 2013). This conceptualization of green spaces is, therefore, linked to the idea of ecosystem services, that is that green spaces are valuable for providing a wide range of benefits, including flood alleviation, carbon storage, enhanced tourism potential, human health and wellbeing, and maintaining local distinctiveness, to which an economic value could be attached (European Commission, 2013). In the United Kingdom a focus on green infrastructure has also been an important element in current Government policy and sponsored projects to develop a new generation of garden cities, towns and villages (Smith and Pratt, 2017; Town and Country Planning Association, 2017).

While Whitehand and Gu (2010) and Whitehand and Morton (2004) identify real barriers to this type of integration, there are causes for optimism. There are already examples that could be expanded upon of components of urban green infrastructure, such as boulevards and walks, being the subject of morphological study (Darin, 2000; Larkham, 2000). It is, for example, interesting to note the examples of tree-lined streets that are central to the identity of European capital cities: Unter den Linden in Berlin (with trees referred to in its name), the Champs-Élysées in Paris, and the Mall in London. Urban morphologists have also made a number of studies of earlier attempts at idealistic town planning, see for example Hall (2005), Kirjakka (2003) and Rego (2014), which could inform the current debate.

An approach informed by urban morphology would gain insights into the causes of the current distribution of green space in an urban area. First, an historico-geographical approach to understanding the wider historical landscape (Conzen, 1988; Whitehand and Gu, 2010) would identify, for example, the importance of embedded fringe belts as a location of green space. Secondly, an awareness of the effect that legislative, economic and individual forces have on the form of development (Larkham and Conzen, 2014) would help in explaining the density of residential development