Chapter 5
The Dark Side of the Grid Revisited: Power and Urban Design

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Abstract In contemporary discussions of preferred urban form, many planners and designers advocate a return to the grid. Proponents of the grid see it as legible, accessible, efficient, traditional, and, perhaps, even egalitarian. This chapter examines the grid in the context of traditions which have used it as a dominant form in city building. A brief historical review shows that the grid has emerged in some societies seeking to diffuse authority among citizens, but appears most commonly in the context of centralizing or globalizing power. The author illustrates that the extraordinary symbolism of the grid as a "rational" built form imposed on landscapes can convey a range of meanings, both positive and negative.

Keywords Grid design · Political authority · Power · Global history · New Urbanism

Introduction

When I began writing an earlier version of this chapter in 1999 (Grant 2001), the advocates of new urbanism—a planning and design movement that promoted a return to "traditional" town-building principles, including the grid street pattern—was rapidly gaining ground in North American planning (Grant 2006). Although many of the benefits the New Urbanists attributed to the grid—including efficient servicing, ease of access, and legibility—made sense, one of their claims struck me as highly problematic and even ethnocentric. In public presentations, and in some of the written materials associated with the movement (Krieger 1991; Duany and Plater-Zyberk 1992), spokespersons suggested or implied that the grid was by its

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nature egalitarian. Having taught planning history for several years, I linked the grid with colonizing regimes such as the Romans and the Spanish. Engaging discussions with students in my classes motivated me to begin a systematic evaluation of the literature to understand the relationship between urban form and power. I was fortunate during the paper's review (at *Planning Perspectives)* to be pushed by reviewers and the editor, Anthony Sutcliffe, to delve deeply for patterns and to theorize from the results. That led me to a three-fold categorization of the way the grid was used under three kinds of political regimes: diffusing authority, centralizing authority, and globalizing authority.

Through ten millennia of urban development, the grid appears with considerable frequency, but it is arguably less common and more recent than are organic layouts, which feature winding lanes and dead-end streets. Moreover, the grid and other patterns of urban form that derive from geometric principles and surveying technology are more frequently associated with the concentration of military power and wealth than with egalitarian traditions. Settlement history reveals vibrant and successful cities of all shapes and sizes. The grid has appeared in societies with divergent systems of authority. It can be linked to tyranny and monarchy as well as to democracy. It appears in association with many economic adaptations. While we do find the grid associated with some societies that attempt to diffuse authority (by empowering citizens politically, economically, or socially), we find it more often in conjunction with societies that concentrate power and wealth by centralizing authority or even globalizing authority. People choose to use the grid layout for various reasons to serve multiple functions. The record offers no simple correlation between specific physical forms and social patterns or aspirations.

Scholars too rarely get the opportunity to return to key works written long ago. I have found it invigorating to have the chance to re-evaluate the evidence, reconsider my stance, and refine my thinking on this complex topic. A few years after my original paper on the grid and power came out I had some energizing discussions with Michael E. Smith and his colleagues at Arizona State that led me to alternative sources and further reading to clarify my thinking on some urban traditions I discussed. While my interest in this theme came from concerns about contemporary claims in urban planning, Smith (2007) addresses similar issues from the perspective of the archaeologist. His views offer important nuance and arguments that have influenced my thinking. The many revisions of my analysis expressed in this version of the paper owe a debt of gratitude to some of the challenges that recent research in archaeology present to overly simplified theoretical paradigms.

In 2001, I optimistically argued that the pre-historical record offered examples of societies using the grid in ways that diffused power. I am no longer as confident that the grid has been used widely in that way. Further reading led me to sources that changed my thinking about some traditions I thought had been diffusing authority. Of course, the meaning of the grid and its associations with specific power regimes do not last forever. A grid could be used to plan settlements in a society committed to power sharing, but then the form could continue in practice as a republic becomes a tyranny. Or vice versa. There is nothing implicit in the form that commits its use to any power arrangement. As history shows, however, regimes that concentrate

Table 5.1 Approaches to power

Diffusing authority	Centralizing authority	Globalizing authority
Promoting a communitarian or egalitarian philosophy	Promoting the interests of a relatively small elite for aggrandizement	Promoting control over territory for efficient concentration of capital and expansion of wealth
Creating a system of towns or cities to accommodate population	Creating a central nodal capital	Creating key regional capitals, with possible nodal centre
Community members consent to order	Military authority imposes or enforces order (control may be ideological)	Military and economic power impose order (control may be hidden, subtle)
Land linked to liberty, security, identity	Land controlled and used to support the needs of central authorities	Land as commodity and resource

power and wealth seem commonplace, and it is those that have systematically found the grid most useful for town planting.

Developing a Typology of Approaches to Power

Any attempt to create a framework for analyzing the ways in which societies approach power must recognize the diversity of experience that renders classification precarious. The record offers a continuum of approaches within which societies may transform themselves from one to another and back again, even over relatively brief periods of time. Accordingly, any schema which seeks to generate an "evolutionary" framework that postulates progression over time runs headlong into defiant history: while change is inevitable, "progress" is not. For purposes of this analysis, I argue that it is reasonable to present a typology of three basic approaches that characterize urban traditions deploying the grid in history. These categories represent significant differences in social and political structure and provide a useful differentiation for purposes of analysis, but the reader should be cautious to avoid concluding any evolutionary progression between them. Any of these strategies may appear at various times and places through the historical and archaeological record.

Some societies seek to diffuse power by enabling citizens to participate and enjoy the benefits of society widely. This approach to power I call "diffusing authority." Other societies seek to concentrate power for the benefit of a relatively small elite typically located in a capital or nodal city. This approach I call "centralizing authority." Still other societies may aim to expand the range of power geographically to benefit corporate entities or a sizable elite which may be located primarily in key regional capitals. This approach is "globalizing authority" (Table 5.1).

In each of these kinds of societies, religious authority and philosophy generally support the system of power. Cultural values develop to reinforce ways of behaving

and to strengthen systems of authority (Lukes 1974; Gross 1980). All three approaches may yield evidence of charismatic leadership, hereditary leadership, or even electoral rule. Strong military authority commonly appears in association with centralizing and globalizing approaches, but less frequently with diffusing approaches where community members implicitly or explicitly consent to the established order.

Attitudes towards land vary markedly with these different approaches. Diffusing systems typically link land to identity and economic productivity. Land may be held communally, or may be distributed according to accepted principles related to issues of equity or merit. Centralizing and globalizing systems see land as something to control for strategic purposes and from which to wrest value. Centralizing systems tightly control land to serve the needs and power of central authorities. In globalizing systems, land provides the resources that fuel economic growth and expansion.

Before proceeding to apply this typology to civilizations in the historical record, I should first address the use of the term "egalitarian" which has already appeared in the discussion, though not as a label in the framework for analysis. While some may argue that what I have called a "diffusing" approach could be rendered as "egalitarian," I specifically avoid the term in talking about power or authority. The word "egalitarian" asserts a belief in equality, but its meaning can be quite varied. In the context of the relationship (if any) between social systems and built form, we could, for example, use the term to refer to a wide range of phenomena. By "egalitarian" do we mean equal benefits derived from society (including access to food, shelter, health care, and quality of life)? Do we refer to equal participation in society (in which case we must deal with issues of gender, class, age, race, bondage, and personal motivation)? Do we signify equal opportunity (to education, employment, or land)? In terms of "egalitarian" built form we could ask, do we mean platting of land into blocks of equal size, or the generation of individual building or farm lots of equal size, or the ability to gain ready access to all spaces for ease of control? Lacking precision, the word "egalitarian" often becomes a positively charged term attached to the political system or built form of one's affection. Its use in association with discussions of the grid and the kinds of authority systems that may use the grid may thus become problematic.

Applying the Framework to the Historical Record

With the framework in hand, I examined the historical record to find societies that used the grid extensively. I analyzed and categorized societies to determine their approach to authority and to identify similarities and differences among them. The examples discussed here, which because of space limitations are not comprehensive, are summarized in Table 5.2 and described in the following sections.

Table 5.2 Possible examples of approaches to the grid

Diffusing authority	Centralizing authority	Globalizing authority
Harappan (Indus Valley)	Ancient Egypt	Greek, 8th to 6th centuries BCE
Greek, 5th century BCE	Babylon, 7th century BCE	Wari and Inca
Teotihuacan	Alexandria	Japan, castle towns
United States	China	European colonies
Utopian communes	Japan, early capitals	National and corporate expansion, 19th century CE
	Tenotchtitlan	

The Grid in Societies of Globalizing Authority

When ruling interests seek to expand into ever-larger territories, and as economic interests organize more effectively to exploit the resources of empire, societies may move towards globalizing authority. With the growth of empire, controlling distant territories by establishing urban centers throughout the land becomes a useful strategy. The grid allows rapid reproduction of an ideal form and a reasonably fair means of distributing land to new residents. As Mumford (1961) and Galantay (1975) note, the grid was a distinctive feature of colonial towns throughout history. Some well-known examples of states using the grid in this way appear below.

Globalizing societies establish colonial settlements in new territories to secure control over land and resources. In many of the examples presented here, military or governmental authorities established a standard pattern and applied it vigorously to occupied territory. Many of these planned settlements had closed grids defined by defensive walls, at least until military technology rendered such walls useless.[1] Wealth in these empires continued to be funnelled to pivotal cities while also allowing growing concentration of influence in commercial sectors and in regional centers. Although inequality grew great in such societies, the built form often underplayed any hierarchy. As Castagnoli (1971) notes, equality of size and form among residential blocks appeared first in Greek cities during a period of tyrannical government.

[1] Marcuse (1987) argues that in the American context the pre-capitalist grid was closed, while in capitalist economies it is open. The historical record elsewhere does not confirm this hypothesis. Closed grids occur in contemporary gated communities within capitalist societies, while pre-capitalist communities like Teotihuacan featured open grids. More relevant factors to consider in whether the grid is open or closed are the likelihood and technology of security, warfare and taxation, and the rate of population growth.

Greeks, Eighth to Sixth Century BCE

The earliest period of classical Greek history involved considerable colonial expansion. The largest old cities, such as Athens and Sparta, did not follow a grid layout but were enhanced with fine buildings, sculptures, and palaces for rulers. As they moved into new territories, the Greeks forced out indigenous occupants and established new towns for their own people. Colonial cities in the west and north imposed the grid even on quite rough terrain, as the rationality of mathematics and science triumphed over topography (Castagnoli 1971; Owens 1991). Wide avenues and narrow streets created long insulae in the early cities, although regular square blocks appeared later. These blocks were not equally divided within; land was distributed according to rank and means. The new cities added walls as needed and included open spaces for temples, business and social activity. Many scholars argue that the ancient Greeks were the first to use town planning as a key tool for establishing and controlling empires in new regions (Ward-Perkins 1974; Morris 1994; Kostof 1995).

Romans

From the first century BCE to the fourth century CE, the Romans built and expanded cities through much of Europe, West Asia, and Africa, according to a rigid codex (Fig. 5.1). Based on the model of the military camp and reflecting its discipline, the Roman colonial town shows a square or rectangular grid derived from two central axes often oriented to the cardinal directions (Castagnoli 1971, Owens, 1991). Central public spaces, such as the forum, and public amenities, such as baths and amphitheatres, attempted to bring a taste of Roman culture to the provinces. Subjugated peoples in the colonies were often moved into the towns, both for control and for assimilation. Walls surrounded the towns where defense was required. While wealth and resources were funnelled to Rome and regional capitals, the colonial towns helped to disseminate Roman culture and integrate distant lands into the empire. The grid plan, rigorously executed from Africa to Britain, made the global authority of Rome physically manifest (Rykwert, 1988; Stambaugh 1988; Owens 1991).

Wari and Inca

In my original paper, I discussed only the Inca empire here. Further reading, however, confirms that in many ways—including settlement planning—the Inca drew on earlier traditions and building sites established by the Wari empire (sixth to eleventh century CE) before them (McEwan 2009; Schreiber 2009). Through conquered districts, the Wari established settlements such as Pikillacta based on a rigid grid layout; in subsequent centuries, the Inca reoccupied some Wari sites (McEwan 2009). Beginning in the twelfth century, and lasting until the Spanish arrived in the early sixteenth, the Inca led a theocratic state that united much of western and

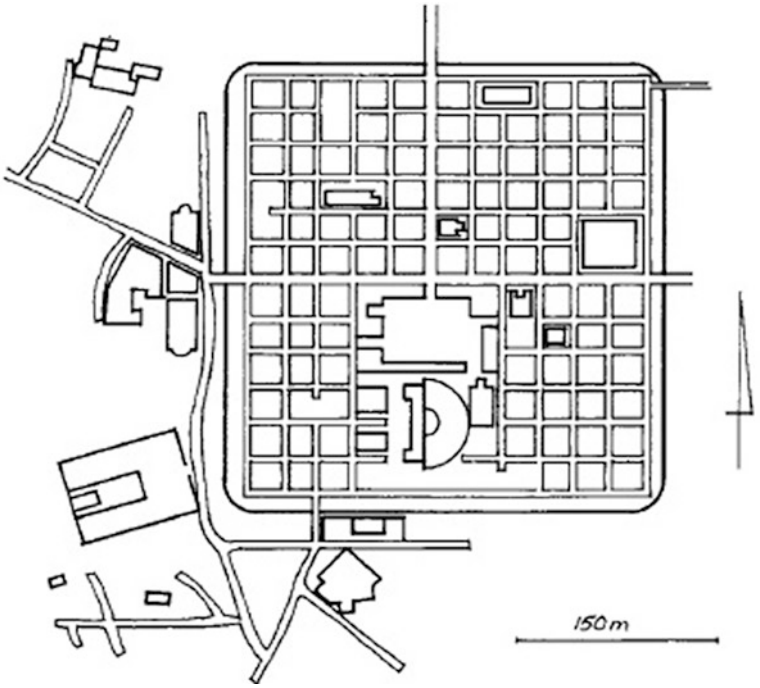

Fig. 5.1 Roman society masked its inherent hierarchy as its army planted "egalitarian" grids through the empire (as in this example of Timgad in Africa)

north-western South America. The capital city of Cuzco followed a rough grid with a magnificent central palace and square. Gridded regional cities appeared throughout the empire to consolidate control (Hardoy 1968). The Inca ruler travelled along the highways linking the cities to reinforce the global reach of the realm. To facilitate control within an area that spanned thousands of kilometers, the Inca moved conquered peoples to these planned settlements through the empire (Von Hagen 1961).

Japan

With the Tokugawa military reunification of Japan in the late sixteenth century CE, the military ruler (*shogun*) commissioned regional lords (*daimyo*) to build castle towns (Fig. 5.2) to ensure the control of territory (Hall 1955). Castle towns were conceptually modelled after the imperial capital, Kyoto, laid out in the tenth century in a centralizing model based on Chinese capital plans (see below). The castle, home to the *daimyo*, generally lay to the north of the town, in a strategic location. Fortifications and moats protected it from attack. Around it (especially to the east or south) stood the warrior samurai quarters, on generous lots within another wall or

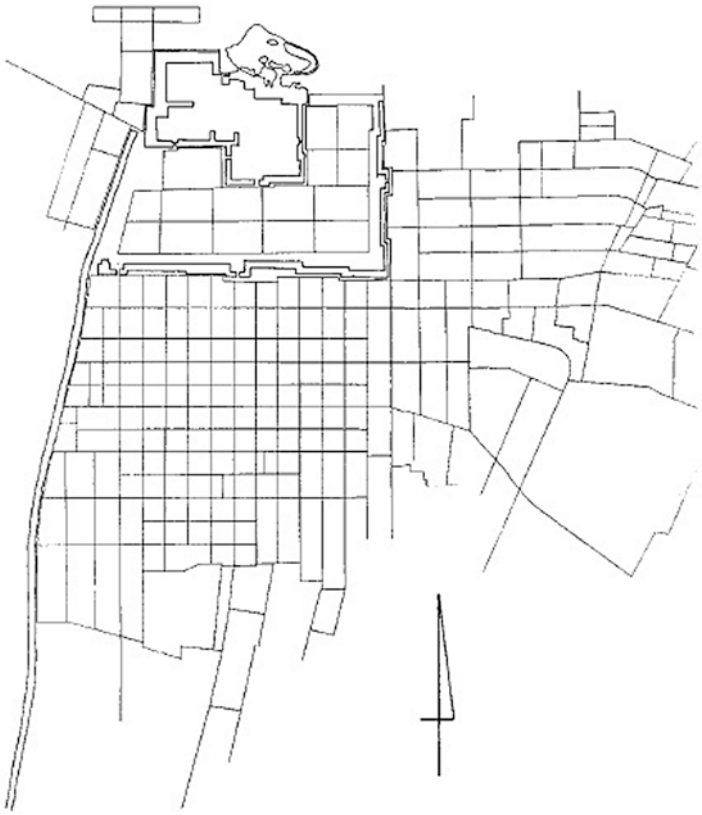

Fig. 5.2 As the shogunate sought to consolidate its hold over a reunited Japan, it planned castle towns (like this one in Nagoya) where the size and position of blocks reflected the inhabitants' positions in society

moat. Outside that lay districts for lower ranked samurai and then to the south the lesser quarters for merchants and artisans, on an open grid of narrow lanes and streets. Although Kyoto remained the nominal capital, considerable wealth funnelled to the administrative center at Edo (Tokyo) and the commercial hub at Osaka (Karan 1997; Shelton 1999; Sorenson 2004).

European Colonies

The era of European exploration and discovery led to the development of colonies on several continents during the sixteenth to nineteenth centuries and to the expansion of new nations in the nineteenth and twentieth centuries. Many of those colonies and new nations relied on the grid for rapid development of settlements. I have space here to discuss only a few examples from North America and Australia. Eager to control territory, these nations used land as a way of attracting settlers to areas

being taken from indigenous inhabitants. With military forces and commercial corporations establishing a foothold in new regions, the grid was an expeditious mechanism for preparing land for settlement. The Spanish under Philip II in 1573 developed an explicit code, the Laws of the Indies, to guide planners in setting out wide streets, public squares, and sites for churches and town buildings (Stanislawski 1947; Reps 1965). Other European nations took similar notions and carried them around the world to expand their spheres of influence (Galantay 1975).

At Louisbourg in eastern Canada, the French built a town for a population of 4000 in a square grid, heavily fortified. The British preferred rectangular grids aligned with a baseline along the harbor: they included a central parade square around which they built public buildings and churches (Wolfe 1994). Early settlements had palisades but, as hostilities with the French ended, the open grid came to dominate.[2] As settlers pressed westward, Dominion authorities switched to a square grid, applying it across the prairies as an efficient means of surveying and equitable way of distributing land (Wolfe 1994; Hodge and Gordon 2014).

In the nineteenth century, the British sought to attract settlers to Australia. Under the direction of Colonel William Light, the state of South Australia planned a system of settlements (Hutchings and Bunker 1986). The largest, Adelaide, featured interlocking and facing street grids reminiscent of the pattern of early Philadelphia (with five squares and rectangular blocks). All the towns had planned parks, a commercial core, and residential districts surrounded by a green belt. Settlers received farm lots outside the towns (Hutchings and Bunker 1986).

The grid provided a ready mechanism for rapid expansion and control of occupied territory not only in colonies around the world but also for new nations like the United States. Through the nineteenth century, as the U.S. expanded westward, the grid lost its earlier associations (as a land distribution mechanism associated with liberty and suffrage for able-bodied men—see below) and instead became a means for turning land into a commodity for speculation (Reps 1965; Marcuse 1987; Ward 1998). Aligned with the cardinal directions, the survey grid was rigorously applied to property boundaries, regardless of terrain. Western cities like Chicago grew rapidly along streets marching vigorously to the cardinal directions in an open grid (Cronon 1991). A form that may have begun alongside an egalitarian or communitarian ideology had by the nineteenth century become a technique for the disposition of a valued commodity to settlers who would facilitate state control of a landscape wrested from its indigenous inhabitants (Reps 1965; Hurtt 1983).

Civilizations pursuing a globalizing approach to authority are expansionist in their intentions, at least in key stages of development. Most rely on military might and economic prowess for their dominance. Some, such as the Inca, the Japanese, and the Romans, employed religious precepts suggesting divine origins for their rulers as ideological justification for the hierarchy they imposed on people and landscapes. The societies described here all used the grid as a template for rapid dissemination of an idea of the city, encapsulating and promulgating the ideology of

[2] In some cities, the street system reverted to an organic pattern outside the early core, while in other cases surveyors laid out new grid sections to accommodate growth.

the regime. All developed a system of settlements designed to facilitate the exploitation of the resources of empire for the interests of an elite located in important settlements throughout the system. Similarly, in the nineteenth century some countries offered land and other incentives to land development or railway corporations to develop vital national infrastructure and to plant service towns along transportation networks. The resulting towns—such as 33 communities built by the Illinois Central railway in the 1880s (Galantay 1975)—often faithfully reproduced grid layouts across North America and Australia (Reps 1965; Hutchings and Bunker 1986).

The Grid in Societies of Centralizing Authority

The creation of many of the greatest cities and monuments in human history appears linked to societies engaged in centralizing authority. Some societies devoted enormous wealth to the enhancement of nodal capital cities for the glory of the ruler and a small elite. In these traditions, rulers controlled the empire by and from the capital city, with the resources of the land channelled into the center. Formal central spaces at the core of the city usually included imperial palaces or religious precincts off-limits to the masses. The cities were often closed grids, walled or isolated (as on an island) to control access. Strong military control and religious ideology provided key underpinnings to maintaining authority.

Egypt

During the Middle and New Kingdoms in ancient Egypt (around 2060–1070 BCE), the great empire of the Nile River Valley built several settlements using grid plans. Each king or pharaoh chose a new location for his funerary monument and built a town there for his administrators and builders (Kostof 1995). Egyptian towns and cities were often ephemeral, abandoned once their revered creators passed away. The town at Kahun (Fig. 5.3) from the nineteenth century BCE featured mass-produced worker housing in a segregated grid layout, as did the worker's compound at the new capital built at Tel el Amarna in the fourteenth century BCE (Fairman 1949; Kemp 1977; Morris 1994). Such hierarchical, closed grids were bounded by walls, perhaps to facilitate surveillance and control (Kostof 1995).

Babylon

Early civilizations in Mesopotamia relied on winding street patterns, but the grid gradually gained in importance, particularly in Babylon. In 604 BCE, Nebuchadnezzar established a new kingdom headquartered in a rebuilt Babylon. With a high tower and palace and laid out in a formal grid, the city stood at the height of urbanity in its time and drew on the resources of a vast region (Chiera 1938). Hanging gardens and

Fig. 5.3 The closed grid for Kahun, Egypt, illustrates hierarchy and segregation

a great wall mounted with magnificent gates made the city famous. Nebuchadnezzar centralized elite populations and wealth in Babylon, rather than exporting his urban model to other parts of regions conquered. As his empire expanded, the king brought captured peoples from across the region to the city for assimilation. Described in the Biblical chronicles of the captive Judaeans, Babylon became a cultural and religious metaphor for luxury, iniquity, and oppression (Sagg 1962; Macqueen 1965; Girouard 1985).

Alexandria

The classical Greek era came to an end with the successes of Philip of Macedon and his son, Alexander, in the fourth century BCE. Conquering much of the Mediterranean and Asia Minor, Alexander planted as many as 70 cities to spread Hellenistic civilization and facilitate trade: whether he deployed the grid prior to the building of Alexandria in Egypt in 332 BCE is unclear (Hammond 1998).[3] Planned by Deinocrates, Alexandria featured a grand central axial road more than 30 meters wide and a grid of streets linking harbors on two sides of an isthmus. Alexandria had great buildings, parks, temples and a palace intended to reap the benefits of the

[3] If evidence exists that suggests other cities planted by Alexander used the grid, then I would reclassify Alexandrian planning to the globalizing category.

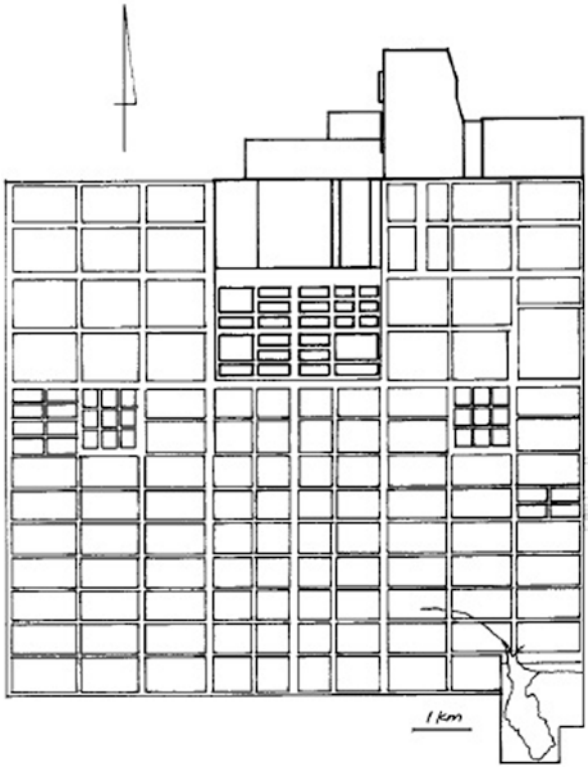

Fig. 5.4 In cities like Changa'an the hiercharical grid of the built form reflects structural inequalities within the civilization

growing empire. However, Alexander's early death and a fight for succession meant that Alexandria did not become the nodal city of the vast empire he sought to create. Instead, under the Ptolemies, the Alexandrian grid served a centralizing function as plan for the capital of a more modest Egyptian kingdom (Benevolo 1980; Morris 1994).

China

From the first to the tenth century CE, a succession of Chinese dynasties established capital cities from which they ruled their empires (Wu 1986). The Han and Wei Dynasties ruled from Luoyang, capital from the first to the sixth centuries (Wu 1986). Its successor, Chang'an (seventh to tenth centuries), also followed a grid linked to the cardinal directions with a clear hierarchy of space (Fig. 5.4). In the north were the walled palace and administrative quarters. A wide avenue led north from the main gate in the earthen city wall. A million residents lived in cramped quarters in walled districts within Chang'an; as many as a million more may have lived outside the walls in the city's suburbs (Wright 1967). The only real public spaces were the markets and roads. At the end of the Silk Road, the Chinese capital

was the business heart of a growing empire (Wright 1967; Morris 1994). While provincial capitals often emulated the model of the heavenly city, the design was infrequently adopted for the design of less important towns.

Japan

Inspired by the Chinese, Japan's imperial rulers established similar capitals to control the landscape from the eighth century CE onward. Nara (in the eighth century) and Kyoto (from the ninth century) also featured palaces and administrative districts to the north and a broad central avenue leading from the southern main gate (Nara National Cultural Properties n.d.). Unlike the Chinese capitals, however, the Japanese cities did not fill out according to plan and parts of the grid were abandoned as the economic center of the cities moved eastward (Hall 1970). With no real threat of attack in the early decades of empire, the rulers of Japan did not complete the earthen walls, allowing the grid to open and extend as required. As in the Chinese cities, markets, roads, and bridges provided the essential public spaces for the population and a religious ideology which held the emperor as divine provided the justification for spatial and economic hierarchy (Hall 1970; Shelton 1999). In the period when Japan adopted centralizing grid plans for its capital city, rulers in Korea and other parts of East Asia were similarly applying hierarchical grids for their capitals (Galantay 1975).

Tenotchtitlan

From their base in what is now Mexico City, the Aztecs ruled a vast military empire that controlled much of Central America during the fourteenth to sixteenth centuries CE. Tenotchtitlan exemplified and monopolized the wealth of the empire, with grand temple and palace at the center of an axial grid layout. Located on islands in a shallow lake, the capital amazed the conquering Spanish with its size and sophistication. Drawing on examples from the ruins in the Valley of Mexico, the Aztecs imagined their capital to emulate the grid, monuments, and great squares of earlier civilizations (Bernal 1967). As Smith (2008) notes, though, the Aztec did not use orthogonal planning for their regional capitals. Moreover, the grid in Tenotchtitlan resulted not from the planning of streets but as the legacy of agricultural practices: rectangular *chinampas* (raised farm beds) eventually became residential building platforms that produced a grid (Smith 2007, 2008). The grid never served a globalizing purpose for the Aztecs, but certainly played a centralizing function.

The capital cities of centralizing societies show several features in common. The wealth of a vast region funnels into the nodal capital city to reinforce and concretize the authority and luxury of those in power. In many cases, these societies feature strong military forces and a religious ideology which deifies the hereditary leadership (royalty). The building and rebuilding of these cities symbolizes the aggrandizement of those in power. Within the hierarchical grid of the city are privi-

leged areas for rulers, administrators, and religious authorities. These are typically off-limits to the masses and may be walled to exclude them. Thus, the order of society is reified through the spatial structure of the nodal city. While other urban centers may form or be created, they are clearly secondary to the capital and need not emulate its form.

The Grid in Societies of Diffusing Authority

The gross disparities of urban wealth and privilege that appear in centralizing and globalizing systems are missing from societies that diffuse authority. Societies where rulers seek to diffuse authority and share power are uncommon in the historical record of cities. History suggests that cities are more typically associated with the accumulation and concentration of wealth and power in the hands of elites. Nonetheless, we do find potential examples of societies that have attempted to distribute or downplay power while developing an urban system using the grid. The examples that follow are those I discussed in the original paper. At that time, I believed that they showed a pattern of encouraging citizenship and political participation of a substantial proportion of members of the communities. I acknowledged then that we needed to remember that many people in these societies were precluded from active participation because of gender, age, race, or caste. As new data have emerged and as I have read further about some of these systems, my original optimism that they represented examples of the benign use of the grid have sometimes been shaken, as noted below.

The built form of towns and cities associated with diffusing authority often show central spaces for public use. These may include commons, squares, religious areas, recreational facilities, granaries, or workshops. Amenities such as water supplies and sewerage may take advantage of the planned streets of the grid for service delivery. The religious and political ideologies of these societies tend to diminish or under-play hierarchy and may promulgate egalitarian ideals. In some cases, land may be held communally or segmented into portions of roughly equal size for building and farming.

Harappan Cities

The earliest use of the grid in human history occurs in a civilization which some sources suggest shows evidence of diffusing authority and middle-class prosperity (Wheeler 1966; Meadow 1991). From about 2500 to 1900 BCE, a system of cities prospered in the Indus Valley of Southwest Asia. Home to approximately 40,000 people each, cities such as Mohenjo-Daro and Harappa enjoyed a wide range of amenities: water supply, sewer drains, wells, granaries, and workshops. Most homes had bathing platforms and latrines, providing a high standard of living (Kenoyer 1998). While some sources deny the existence of hierarchy because they find no

sculptural or artistic evidence of powerful rulers or elaborate religious organizations (Wheeler 1966), other scholars (Allchin and Allchin 1982; Possehl 1990, 1997) note variations in dwelling sizes and artifacts, and argue that some classes of workers would have spent their days laboring to empty cess pits and free sewer drains of clogs. Burials show different patterns of grave goods (suggesting status hierarchies) and high levels of violence experienced by those in lower status burials (Robbins Schug et al. 2012; Robbins Schug et al. 2013). Authority may have been much less diffused than Meadow (1991) and Wheeler (1966) suggested. Since major processional avenues divide the cities, and residential areas have a network of lanes running off the avenue, some sources describe Indus Valley sites as having grid layouts (Wheeler 1966): however, Jansen doubts even the premise of a formal grid-iron plan, noting that over hundreds of years of re-building the orientation of structures in Mohenjo-Daro shifted from roughly north to north-northeast and the jumble of building layers complicates exposure of the original pattern (Jansen 1989, 1993).

Greek Cities, Fifth Century BCE

After several centuries of colonial expansion, some ancient Greek city states, like Athens, developed a democratic ideology that encouraged male citizens to participate in political decision-making. Despite the egalitarian ideology of some city-states in the period, the realities of colonization, slavery, and gender discrimination limited full participation to less than 10% of the population. Some cities built or rebuilt during this period, like Miletos (Fig. 5.5), Thourioi, Rhodes, and Olynthos, not only show large central public spaces and facilities like temples, baths, and schools, but reveal a regular grid of residential areas of similar size and shape (Owens 1991; Morris 1994). Communities were well-defined but of limited size. Women, children, and slaves lived in modest housing while male citizens enjoyed the beautiful public buildings and spaces (Owens 1991). The Greeks built gridded cities as a means of colonizing newly acquired territory, forcing out indigenous inhabitants and imposing their own rational urban forms on the landscape. Although the Greeks empowered an element of their own population, they did so at the expense of many more. While the built form of a settlement like Miletos may appear "egalitarian" in its uniform street grid, it required considerable central control to implement and maintain (Ward-Perkins 1974).

Teotihuacan

From the first through the seventh centuries CE, a large city dominated the Valley of Mexico. The ruins of Teotihuacan reveal a monumental open grid layout with 2000 planned apartment compounds to house as many as 100,000 residents (Hardoy 1968; Cowgill 1997, 2015). A grand processional avenue bisects the city from north to south, flanked by pyramids and temples. In the original paper, I drew heavily on Ester Pasztory's (1997) book on Teotihuacan. She argues that Teotihuacan was

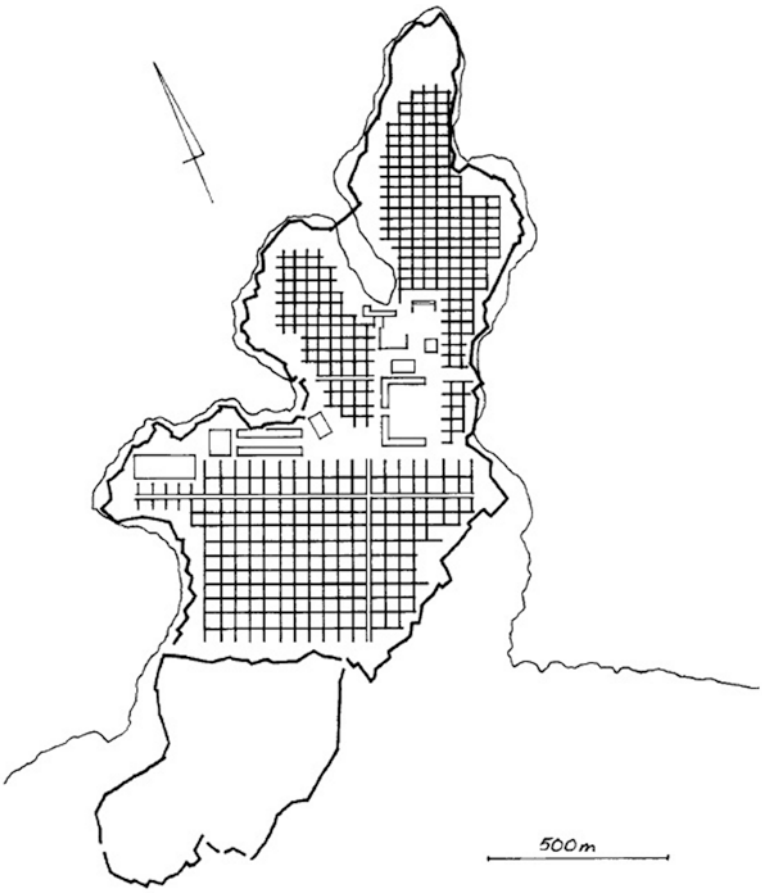

Fig. 5.5 The ancient Greek city of Miletos (in modern Turkey) featured a comprehensive grid of equal-sized blocks

organized as a communal society with administrators making decisions on behalf of the people: hence, I included the city in the category of using the grid while diffusing authority. Other scholars, however, debate Pasztory's analysis. Cowgill (1997) argues that Teotihuacan was not peaceful, and local elites served their own interests in building the city. Elite quarters are larger than most and have high quality murals decorating the walls (Cowgill 2015). Although the ruins of Teotihuacan do not illustrate the exploits of specific rulers, we cannot take that absence as evidence that elites did not control the city. Perhaps their art forms specifically avoided such references. Spence et al. (2004) and White et al. (2002) describe the sacrifice of more than 200 people (many of them local in origin) at the Feathered Serpent Pyramid in the city: an extreme exercise of power and social control that may increase skepticism about the extent of authority diffused in the city.

Early America

During the seventeenth and eighteenth centuries, the American colonies and nation relied increasingly on the grid to pattern their towns (Goodman and Freund 1968). As Hurtt (1983, 32) notes, the Continental Congress of 1785 entrenched the grid as a "reassuring symbol of settlement, safety and civilization." Early settlers belonging to dissenting religious groups committed to equality and liberty used the distribution of land as a way of conferring suffrage on male members of the community; each white male settler received enough land to gain rights. The town, Hurtt (1983) says, codified the ideal social order. The nine-square plan included a central square or common to provide space for meeting hall, church, and green, with home lots on the surrounding streets of the open grid (Rae 2005). Early cities like Philadelphia (1681) and Savannah (1733), with their strong grid interrupted with open squares (Fig. 5.6), became models for further urban development (Bacon 1967; Reps 1965; Benevolo 1980). By using equal-sized sections for surveying the nation, the continental grid reinforced the links between property and liberty that fuelled the revolution. While British and later other European settlers benefited from development through the grid, indigenous communities found themselves displaced from the land and persons of color enjoyed few rights or amenities.

Utopian Communes

In the nineteenth century, philanthropists and religious organizations established model communities and Utopian communes to give physical form and growing space to social objectives (Creese 1966; Benevolo 1967). Some of these settlements, like New Harmony, Indiana, employed a simple and closed grid with common spaces around a central square or green (Creese 1966). Common ownership of the land and shared facilities reflected the socialist and communitarian ideals of many of the movements behind the new communities. Most of these settlements were quite small and lasted only a few years or decades.

Urban traditions using the grid in a way that may diffuse authority share the notion that urban space should be designed to meet the needs and improve the lives of residents. They have used the grid as a mechanism for standardizing the pattern and distribution of space with such social objectives in mind. Hierarchy that may appear in the grid in these settlements favors public spaces intended for common use, which are often centrally located or made easily accessible. Leaders or administrators selected by members of the community governed some of these settlements, although we have no way of knowing how leaders arose in the Indus Valley or Teotihuacan.

Despite the democratic or communitarian ideology, which may have characterized some of the traditions discussed here, not everyone in these communities shared the benefits of urban life equally. Many of the societies—even the nominally democratic ones—with grids that may diffuse authority show evidence of bondage or caste systems which relegated many to a life of servitude. Women did not share

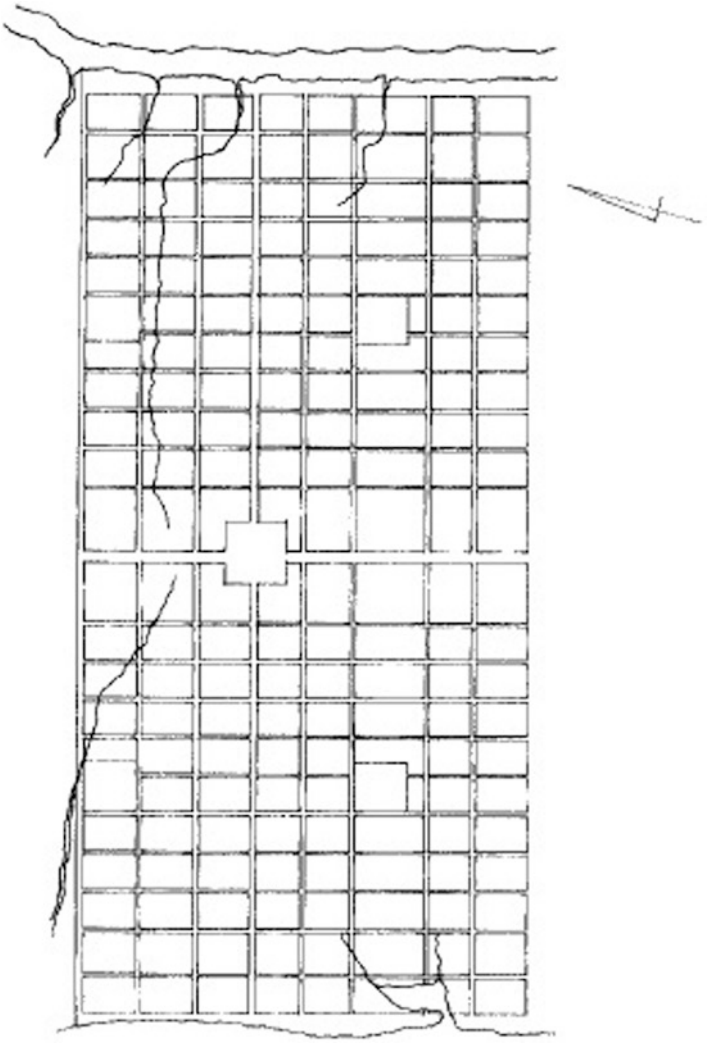

Fig. 5.6 Philadelphia, with its axial avenues and straight-forward grid, became something of a model for American urban form

equally in decision-making. Some residents were enslaved. Indigenous inhabitants of landscapes were often forced from the land, assimilated or enslaved by newcomers. Although a society that sees an element of power-sharing as its guiding philosophy may be drawn to an egalitarian grid as a formal spatial representation of its ideology, a grid of equal proportions and common access does not necessarily imply an egalitarian society. With access to additional research and analysis, I can no longer conclude that these examples constitute persuasive evidence that the grid is

often used to diffuse authority. We more commonly find urban societies that centralize or even globalize authority employing the grid to develop new communities.

Contrasting Patterns

Hurtt (1983, 37) suggests that the grid represses hierarchy: "The street, in its grid form, is anathema to closure, dominance and hierarchy and is the antagonist to locus and place." But appearances can be deceiving. Form and function are not inextricably linked. Grids that differ in residential block size and access to desirable amenities appear hierarchal. Urban grids with common proportions look egalitarian, but consistent block sizes or patterns do not necessarily signal regimes that are diffusing authority. As was the case for the Romans, a globalizing authority eager to accumulate wealth and monopolize power can deploy grids that some may call egalitarian in form. Other globalizing regimes—as in Tokugawa Japan—prefer hierarchical grids and do not hesitate to enclose sections of the city to control access. Centralizing authority regimes frequently use hierarchical urban grids with blocks of different sizes and other elements of urban form to reinforce symbolic power and facilitate systems of exclusion.

What factors make a grid appear "egalitarian" or "hierarchical"? The street pattern is obviously pivotal. Avenues leading to key spaces and streets of varying dimensions signify order and, in some cases, hierarchy. Street layout may create blocks of equal or of varying size. Blocks of differing size are often linked to patterns of wealth as shown in the archaeological record: that is, the larger blocks are typically the domains of the more affluent (although they could have different functions, such as commercial or industrial uses). We cannot reasonably conclude, however, that equal-sized blocks reflected equitable living standards throughout the city. In many of the cities described, the affluent dominated some neighbourhoods, enjoying much larger lots and better-appointed homes than did ordinary residents, even in "egalitarian grids." Block pattern may not reflect social conditions and levels of hierarchy and inequality within society, especially where social classes are not spatially segregated. Where democracy and egalitarian principles prevail, land may be distributed widely. In some settlements, all households may receive equal-sized parcels of land, or parcels sized to the number of members of the household. Over time, however, with generational and economic change, patterns change quickly and even what began as an egalitarian grid may well become spatially and socially segregated.

The Contemporary Grid

By the time that the modern town planning movement developed in the early twentieth century, the urban grid that dominated colonial and North American urban design had fallen out of favor, criticized as monotonous, rigid, old-fashioned, and unattractive (Bacon 1967; Benevolo 1967; Creese 1966). Winding, organic street patterns became popular and came to characterize broad areas of urban development for much of the twentieth century (Marshall 2005). By the late twentieth century, though, the grid (or modified versions of it) began a comeback. Inspired by the ideas of Jane Jacobs (1961), Peter Calthorpe (1993), and the team of Andres Duany and Elizabeth Plater-Zyberk (1992, 1996), many planners began to describe the grid of the old towns and cities as preferable to suburban sprawl. The search for community, vitality, and sustainability in the urban and suburban environment led many to argue that such attributes were readily associated with the grid. Developers seeking an edge in competitive suburban markets began experimenting with modified grids in projects like Seaside, FL, Celebration, FL, and McKenzie Towne (Calgary, AB). New Urbanism was born, not with the monolithic grids of earlier planned traditions, but using relatively small-scale plats with public squares, commons, and greens that simultaneously convey an impression of quality and character (Fig. 5.7).

New Urbanists argue that settlements need a mix of housing types to provide homes for all sectors of society; they seek a mix of uses, so that people can live without cars, by walking or taking transit to work or shop; they want to enhance sociability and participation in society. However, the reality of the New Urbanist projects built to date belies any rhetoric of diffusing authority. These projects are essentially upscale, suburban enclaves providing bedroom communities for the affluent (McCann 1995; Grant 2006). Even in a community like Celebration, FL, where the "modified grid" provides lots of similar size throughout town, significant differences in wealth obtain and are reflected in housing and other consumer goods; there are few places for the working poor to rent (Ross 1999). Rather than diffusing authority, such developments reinforce economic hierarchy. They are the creatures of a globalizing neoliberal culture that mutes uncomfortable truths through attractive design codes (Horne 1986; Brenner and Theodore 2002).

Those who advocate the grid today—and there are many—suggest that it offers the best form to ensure connectivity, walkability, efficient servicing, legibility, and ease of navigation. Movements such as smart growth and complete streets share allegiance to the grid.[4] Urban planners have overwhelmingly converted to encouraging grid layouts, and some North American plans effectively require grids. It is rare now—in an era where we worry about divided or dual cities of rich and poor (Marcuse 1989)—to hear planners suggest that grids are egalitarian, though they are quick to say the urban form promises more equitable access. The grid has become

[4] For instance, explore these web sites: http://www.newurbanism.org/newurbanism/principles.html
http://completestreetsforcanada.ca/element-5-encourages-connectivity
https://www.epa.gov/smartgrowth/smart-location-mapping

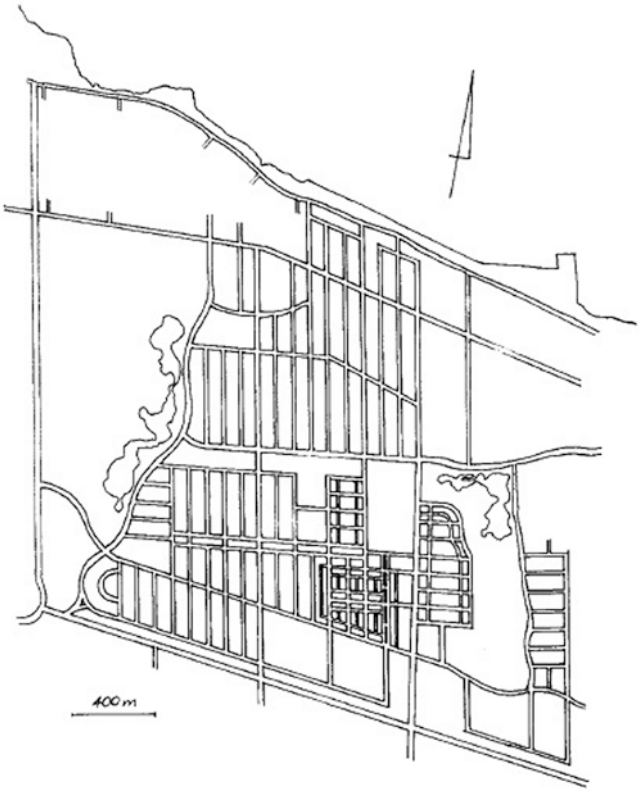

Fig 5.7 With the rise of New Urbanism, some suburbs, like this one in East Riverside, Windsor (Canada), show growth along grid layouts

embedded within a system of real estate financing and marketing that employs it to quickly commodify land. As was the case for the Greeks, the Romans, and colonizing Europeans, the grid has become fashionable and can be filled with the values important to those who deploy it. When the openness of the grid presents a problem, however, in that it may facilitate access for unwanted parties or may affect perceived property values, authorities may permit the closure or privatization of streets, or the erection of barricades (Grant and Curran 2007; Tedong et al. 2014). That many planned projects are also gated for security reasons exposes the egalitarian myths of public culture for what they can be: a mask for denying difference and globalizing power (Horne 1986; Low 2003).

Conclusion

This brief review of the grid in history finds no simple correlation between physical form and social objectives. The grid appears in many kinds of society serving divergent purposes. Hierarchical grids typically reflect and reinforce stratified social orders, but the meaning conveyed by non-hierarchical grids can differ widely. In every instance, however, the grid clearly signifies that planners were at work. It denies spontaneity and indigenous urban or landscape traditions. It imposes a rational conceptual order that transcends time, and proclaims the control and power of central authorities to shape space.

As Marcuse (1987, 307) says, "the grid is neither always as bad a plan as it has been painted in the recent planning literature, nor as 'good' a plan as its international and long-lasting adoption would suggest." The grid's usefulness as a ready template for urbanization ensures its attractiveness for colonial and expansionary societies. The form is not, however, without its warts. In some societies, the grid may have been associated with attempts to enfranchise some members of society, while in other societies the grid provided mass-produced accommodations for a life of servitude. The historical record illustrates that the grid has been associated with centralizing or globalizing societies for most of urban history. Large-scale societies promoting egalitarian philosophies prove rare; indeed, hierarchy seems intrinsically linked to urbanism, even in societies that may initially seek to diffuse authority. Thus, the grid has a dark side in as much as it has served so frequently as a tool and symbol of dominance and repression (Yiftachel 1998).

Planners' preferences for the grid plan reminds me of a saying: "if the only tool I have is a hammer, everything looks like a nail." The grid is the quintessential mark that a planner was at work. But if, as planners, we intend to argue that the grid is the best solution to contemporary dilemmas, then we have a responsibility to understand its history as we assess its potential. The grid is not inherently evil, but its strong historical association with colonization, centralization, and globalization gives pause for thought. What messages do designers convey by promoting the grid? While planners may justly critique the winding patterns of twentieth-century suburbia as confusing and monotonous, we must also recognize that such landscapes created the contexts within which millions of people generated meaningful social environments and achieved a standard of living to which others aspire. Is it these urban forms and landscape patterns which generated the problems we now seek to solve, such as lack of affordable housing, loss of farmland, over-use of the automobile, search for community? Or are we continuing to look for simplistic physical solutions to social and economic problems that derive from the structure of our society? Whether the grid is the appropriate solution to the problems of contemporary urbanization remains debatable. In the discussion of suitable planning approaches, planners should recognize the varied history of the forms we promote. We have a responsibility to be skeptical of simplistic solutions to complex problems.

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