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VIEWPOINT

Were Cities Built as Images?

Many ancient city sites display a remarkable regularity in their plan which has led to considerable debate on the symbolism and intentionality which may lie behind these arrangements. Grid plan cities of the Greek and Roman world were discussed by Haverfield almost a century ago, but it was above all the cities of South and East Asia analyzed by Wheatley in his influential Pivot of the Four Quarters *(1971) which has given new emphasis to the potential of meaning and significance. Such planned cities necessarily incorporate an essential tension between* praxis *— the practical day-to-day needs of the urban community — and idealism, the desire to impose on those practical concerns a city-plan which expresses a symbolic or cosmological image. Contemporary texts, where they exist, may help towards an answer, but the physicality of the city plan itself provides the crucial ground for argument as to whether symbolic or ideological imperatives governed the actual outcome. Cities may be conceptualized in ideal terms without ever taking on the physical attributes of any ideal form. The contributors to this Viewpoint approach the issue from a diversity of standpoints and with reference to different geographical areas. Were cities built as images? Did powerful belief systems combined with strong centralized control give rise to cities where the moat represented the encircling sea and the raised cathedral the mountain-dwelling of the gods? Or are such readings more the product of Western analysis and wishful thinking than the original intentions of their builders? The discussion here is opened by an architectural historian, who places city-planning firmly within the Western intellectual tradition, and considers it in particular as a product of Greek geometry. A series of regional specialists then take up the baton and assess the evidence for symbolic city planning in Egypt, the Roman world, South and Southeast Asia, and Mesoamerica. How far did cities of the Classical world conform to ideas set out by Aristotle and Vitruvius? Were the regulations of the Artashastra really adopted as a practical guide for city lay-out in South Asia? The balance of evidence — of what may have been intended, against what was actually laid out on the ground — provides fertile ground for a stimulating diversity of opinions.*

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City-image versus Topography of *Praxis*

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The theme of 'city as image' has a vivid history in architecture, particularly since the Renaissance, when *disegno* (both 'drawing' and 'design') became the principal vehicle for contemporary projects as well as for recording extant cities, reconstructing ancient ones and opening speculations on 'symbolic' cities (as well as for painting, theatre, the natural sciences). This mode of self-representation appears together with the developing mode of self-understanding that subsequently calls itself 'theory'. The Renaissance city (or city-state or city-republic) often symbolized human order as a whole; and it is tempting to hear in the phrase 'city-image' the baleful influence of the 'world-picture' (*Weltanschauung*: Heidegger 1977; 1975; Gadamer 1975; 1985). 'Image' in this sense not only implies the laying-out of buildings but, even more, making culture as a whole available to design, a project for accomplishment. The most influential formulation of creating or refining a culture through its arts was that of Herder, who may also be credited with transforming the Romantic *Bildung* (from *Bild*, 'image') into a didactic cultural programme.

This possibility is only latent in the so-called 'ideal city' of the Renaissance; and it is not until the eighteenth century that one can see its unambiguous presence in such utopian efforts as those of Ledoux (1804). What Ledoux's confidence shares with its counter-form, the *Carceri* series of Piranesi (1761), is their status as publications: their principal context is the reflective setting of the Enlightenment library.

We owe to Romantic thinking the constitution of historical change as a sequence of episodes governed by remorse at current conditions coupled to a desire to do something about them. Originally very global, such episodes currently tend to happen in questions of methodology, approach, modes of understanding (in architecture, these episodes tend to provoke a search for new 'forms'). That is, most of the activity prevails in the conceptual horizon; and, although we might believe that we have left well behind the Hegelian dialectics of matter and spirit, I see them preserved in such expressions as 'material culture', in archaeology, and 'built-form', in architecture (where 'form' connotes the embodiment of cultural ideals), as well as in the expression 'city-image'. Moreover, both archaeology and architecture seem divided in their emphasis upon one half of this dialectics or the other: either material and functional processes or symbolic and representational ones. The worry for both disciplines, is that the expression 'city as image' should be translated 'city as concept' (most evident in the profligate use of such terminology as 'aesthetics', 'ideology', 'technology', 'commerce' or 'space'). If so, the term would seem intrinsically useless for analysis of all but post-Enlightenment cities; and, correlatively, it may bear on our current persistent inability to make decent cities.

Ultimately lying behind the problem of 'city as image' is the meaning of the whole, something which our current interpretive orientations are ill-disposed to understand. Consequently, a special fascination attaches to settlement configurations which seem to embody a vivid sense of the whole in a 'cosmic' diagram, or 'cosmogram' (O'Connor 1998). Ancient kings and rulers had considerable power over their subjects, and yet cities configured as 'cosmograms' are quite rare (see Appendix). The rarity implies that something so nominally effective must involve more than the 'cosmogram' and its relation to 'design'. The temple-speculation of Jewish Apocalyptic, Plutarch's tale of Alexander's *chlamys* as the pattern for the Egyptian Alexandria, Vitruvius' story of Denocrates' proposal to configure Mount Athos in the figure of Alexander as well as his own wind-rose city, John of Patmos' Heavenly Jerusalem — all suggest that it was possible to think such a proposition, but that it was mainly confined to speculative writing. The principal sources for Wheatley's (1971, partic. ch. 5) symbolism of the four quarters are late textual systematizations such as the *K'ao-kung Chi* and the *Arthasastra*, which share with Vitruvius a concern to coordinate building-practice directly with 'cosmic symbolism'. This form of writing is among the representational possibilities granted *by* the city; and the language of prescriptive constructional techniques should be regarded as a figurative motif. Similarly, inscriptions, reliefs, paintings can be more explicitly 'symbolic' than can architecture or a town. To this extent a town 'happens' in all these modes of representation, and each requires the others.

Of course a town mostly happens in what people do — in the domain of *praxis* (in the sense meant by Aristotle, *Nich. Ethics*, Book VI; see also Gadamer 1975, second part, II). Since *praxis* addresses the continuity between the making of shoes or temples and the speculative activity for which explicit symbols are the vehicle, one might expect that it would be the common denominator in the interpretation of cities.

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Instead it is commonly suppressed, or taken for granted. It seems to fall between the symbolist's top-down interpretation and the morpho-functionalist's bottom-up interpretation. Moreover, whilst everyone pays lip-service to 'complexity', there is a natural conflict between the methodological requirements of epistemological clarity and the comparative 'messiness' of the practical order. Accordingly, the theme of 'city-image' illuminates a more general possibility that over-dependence upon conceptual categories (material or symbolic) induces an ontological blindness.

It remains to this essay, therefore, to sketch out a mediating order which allows such phenomena as 'cosmograms' to be understood as possible special cases of a more general representational structure or process of figuration. This in turn implies a stratification of symbolic embodiment. By this I mean that there is no such thing as absence of content (no gap between the practical and the symbolic), only progressively more explicit modes of symbolic representation.

The city between symbol and *praxis*

A convenient point of entry into the phenomenon is provided by the *Conlationes* of John Cassian, XIV.8.4 (early fifth century AD: Cassian 1997, 510). He distinguishes four levels in the understanding of Jerusalem: the literal or historical, meaning the city in Palestine where David was king and Jesus was crucified; the analogical, meaning the universal Church, the *ecclesia* of Christians; the tropological or moral, meaning the soul of every Christian; the anagogical (literally, the 'going up'), meaning Heavenly Jerusalem, the Christian *eschaton* (end of time, opposite of *arche*).

Cassian's stratification achieves three things at once: a) it declares a discontinuity between the historical and the symbolic cities of Jerusalem, which b) is understood as a graded continuity of differences, marked c) by different levels of figural language, different levels of understanding (which is Cassian's main concern). Heavenly Jerusalem is the ultimate horizon of identity for the whole group, and is progressively 'anticipated' as one ascends the representational strata. Conversely, the Heavenly City is progressively more concretely embodied as one descends the hierarchy.

Cassian's concern for salvation is not present in his indirect source, Plato's *Politeia* ('Republic', late fifth BC), where also the city carries the symbolization of the whole in terms of a mediated distance (*chorismos*) between the actual city and its symbolic fulfilment, embodied in a stratification of representations. In particular, the sequence from 505a–540b is described by Plato as 'the greatest study (*megiston mathema*): the idea of the good by reference to which just things and all the rest become useful and beneficial (505a)'. Here Plato strives to trace the continuity of identity ('the good') within the differences of reality ('just things and all the rest'). The famous 'Myth of the Cave' (514a *et seq.*) is a reciprocal formulation of the more precise 'Divided Line' (509d ff.), where four strata of reality are divided into a proportional structure. The lowest two strata, grouped under the opinable (*doxaston*) and the visible (*oraton*), comprise images or shadows, then the things of reality; the upper two strata, grouped under the knowable (*gnoston*) and the intelligible (*noeton*), comprise geometrical symbolism and then dialectics. The movement from dialogue to dialectic begins in the concrete 'many' of the *polis* — with, for example, shoemakers and friendship — and seeks to understand the competing interests of the many as an ascending measure of their participation (*methexis*) in the truth of the order (the Highest Good). Conversely, and against the still-common perception of Plato as an 'idealist', the truth of the order is not a governing principle, but is consigned to dwell within the finite, fractious *polis* and its different levels of understanding. Indeed, Plato's dialogue describes a *polis* 'found nowhere on earth' (592a–b); it is a paradigm embodied in text meant to illuminate *praxis* through the operation of political justice.

The Hellenistic transformation

Architecture or urban design do not figure in the paradigmatic aspects of Plato's account (as they also do not in Augustine's *De civitate dei*), although housebuilding is adduced in the pragmatic sphere to exemplify the knowledge by which *techne* ('know-how') achieves its aims. By contrast, Vitruvius would like to see the cosmic meanings *in* the architecture. Since this confusion seems to prevail also in Wheatley and may indeed lie at the heart of any contemporary interest in a 'figured' city, it requires brief explication.

The effect of such confusions is to displace the content of the mediating order from the *praxis* of the *polis* to the visual domain of its architecture. One can see this very clearly in the transformation of the Roman Forum, a transformation evidently inspired by campaigns in the Hellenistic territories and happening at the same time as similar transformations in, for example, the Athenian Agora. The *continuity* of reciprocal relationships of the Republican Forum is converted into visual *unity* in the Imperial Fora.

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This transformation begins with the development of the two Basilicae (Aemelia and Julia) and the Tabularium, which create a single 'room' out of what was previously an aggregate of houses, shrines, political settings, the Domus Regia and a host of other significant sites (Vulcanum, Lacus Curtius, Via Sacra, etc.). However the real power of the proposition is realized by Caesar, whose Forum Julium reduces the entire complicated topography to a few elements — a colonnaded court sealed off from the rest of Rome and focused upon a temple dedicated to Venus Genetrix, the titular deity of the Julio-Claudian family (which, in effect, substitutes for the Temple of Jupiter Optimus Maximus on the Capitoline). Here one sees that the architecture is being asked to enforce a proposition regarding the unity of the culture and who is responsible for it. This single-minded visual generalization presents itself as the summary of, or replacement for, the Republican Forum's intricate matrix of subtly nuanced ritual and ceremonial cycles. It is possible to believe that the Republican Forum is almost neurotic in its ritual complexity; but the Forum Julium is by comparison a concept, dependent upon the original for its credibility. By transposing the content from civic and ritual *praxis* to visual and iconographic contemplation, the content is more easily synthesized; and this motive of cultural synthesis conforms to Caesar's effort to consolidate all significant social, political, ritual and military offices in himself (Weinstock 1971). This motive also accounts for Vitruvius' declaration that the architect needs an unwieldy amount of knowledge (*scientia* and *eruditio* support *ars)* in order to practise his craft (*fabrica et ratiocinatione*) (*De architettura libri decem* I.i.1).

In Caesar, we have a ruler with the power, the interest in cultural synthesis and an architectural understanding which provide fruitful conditions for something like a 'cosmogram'. It is from this period that architecture becomes one of Rome's pre-eminent modes of representation and provides the immediate context for Vitruvius (although his book is actually addressed to Augustus). Architecture could even be deployed speculatively by Hadrian, if the remark from the *Historia Augusta* ('Hadrian', XXVI.5) is to be believed that his villa was a representation of the empire. However, even with all the best conditions available for rendering the Stoic cosmopolis as a 'cosmogram', the known topographies are conceptual reductions of pre-existing civic and temple configurations. There is nothing anywhere like Vitruvius' wind-rose city (I.vi), not even in wall-paintings, which otherwise mingle domestic themes with imagery derived from temples and the theatre.

Vitruvius enjoyed far more influence in the Renaissance than he did in his own time. Common to both Hellenistic and the Renaissance cultures is an interest in the representational possibilities of architecture and urban design, achieved through an emphasis upon their visible attributes, their capacity to support iconography and their capacity to be regulated geometrically. In the Renaissance 'ideal city' as an earthly representation of Heavenly Jerusalem, we have an explicit confusion of symbolic figure and actual city, along with a quasi-theoretical apparatus to support it. Even here, 'cosmogramic' cities appear mostly in the speculations of architects and painters — the tedious vacuity which is the sixteenth-century central-plan town of Palmanova (Veneto) is an exception. However, the phenomenon is important for two different reasons. First, it contributed to proposals, festivals and interventions, which were theatres of iconography oriented to eschatological motives such as the 'Golden Age' (ambiguously symbolic and historical) and rooted in ceremony and ritual. Secondly, the proposition was the basis of the immanent utopias of the Enlightenment (culture as project), and it contributed significantly to the long effort to render symbolic understanding over to conceptual and theoretical determination. Clearly this incarnation of city-as-cosmogram is most inappropriately applied to archaic cities.

The pre-*polis* city

In virtue of their rarity, one must speak of a 'resistance' to cities that are 'cosmograms'. In respect of the stratifications of Plato or Cassian, one would have to say that this resistance arises from the lower end of the hierarchy, the domain of *praxis*, since the upper, more conceptual, end would naturally promote the synthetic thinking necessary for a 'figured city'.

Certainly the most significant contribution to conceptualization in this field is made by geometry, and the cities that solicit description as 'cosmograms' seem mostly to be affairs of geometry, evident in plan dispositions (although animals have also been mooted as well as a still-evolving issue of astral alignment). Three different kinds of geometric phenomena need to be distinguished.

a. Post-Cartesian geometry is of the purely calculative, or purely mathematical, type (Klein 1968; Lachterman 1989). From this grew the descriptive geometry of Monge as well as the co-ordination of optical (perspectival) and geometrical axis that governs French architectural planning up to the

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time of Le Corbusier (even though 'axis' in this sense is used exhaustively, if wrongly, for all architectures that display an orientation or exhibit alignments).

b. In Euclid's geometry, developed in the Platonic Academy, the axiomatic structure embodies the principle of continuity within difference, manifest in relationships of congruency or similitude (*anologia, proportio*), and bearing the cosmogonic symbolism presented in the *Timaeos*. Gadamer's term, the 'arithmos of the *logos*' (Gadamer 1980, 129 ff.) shows how the continuity of identity within *logos*, and symbolized in the geometric relations, is understood to embody the continuity of reality as a whole. The basis for (endless) ambiguity regarding the first and second types of geometry appears in the Vitruvian conversion into actual dimensions and plan-configurations of what, for Plato, is a purely contemplative propaedeutic (preparatory understanding) to dialectics.

c. Thirdly, one must speak of proto-geometrical phenomena, rooted in *praxis*. These will be our concern henceforth.

To this point, we have discussed cities that have their root in the fully-developed *polis*, and therefore within a democratic or republican tradition. The *logos*-culture which sustained this form of city was the medium in which the symbolic inheritance differentiated from the centrality of the preceding Mycenean temple-palace and became embodied in the structures of conflict/negotiation/accommodation of the *polis* (Vernant 1982). We may agree with Husserl (1936) that this *logos*-culture is one pre-condition to the development of a geometry of the Euclidean type — and therefore a *terminus post quem* with regard to its use. It is then, anachronistic to use the term 'geometry' with respect to, for example, an Egyptian temple, let alone a town.

This conclusion places us in the heart of the problem: how is it that evidently complex and coordinated topographies might arise in the absence of a developed geometry? More generally, this question might be framed as follows: what is the possible source for the topographic and architectural distribution of clusters of meaning that allows for their subsequent representation as geometry and for texts built around the literary *topos* of making (e.g. the *Arthashastras*, Vitruvius and, later, post-Renaissance theory)? Lastly, if 'image' in the sense meant here evidently connotes 'cosmos', and if the Eliade-Wheatley (Eliade 1958, 59) use of 'cosmos' or 'cosmic' is another anachronism when applied to cultures for whom this has not been declared as a concept, how is one to understand the universality to which the clustered meanings aspire?

This last question points to the resolution of the others, since the principal difficulty is the imputation of a conceptual thinking to cultural situations which in fact exhibit the pre-conditions to such thinking (indeed to the primacy of 'thought' of this kind). We are obliged to understand the phenomenon as the opposite of a general, cross-cultural concept. The ordering power here arises from interpretations within concrete situations, whose universality is confined to a particular culture. The realm of concrete judgements, the domain of the probable, of making the best of particular circumstances, is the domain of *praxis.* The profoundly rich and nuanced structure of typicality endows *praxis* with its capacity to embody the universal (continuity from practical to symbolic). This typicality is mediated by the institutional life of the culture, which prevails at two levels — the explicit (religious, political, social institutions and their rites, ceremonies, formularies of decorum, etc.) and the implicit (language, customs, habits, etc.). We will confine our attention to the architectural and urban aspects of this phenomenon. For brevity and in order to avoid cross-cultural generalizations, I will restrict my examples to ancient Mesopotamia, but will use terminology such as *praxis* and *techne* to indicate the later philosophical rendering of the phenomena.

Husserl calls attention to the contribution of the processes of fabrication to the formation of this milieu of institutional typicality; and anyone familiar with traditional building-practices will be aware of the spectrum of habits, recurring postures, terms, procedures and rites which attend such processes, as well as the use of standardized tools, materials, dimensions, ornamental motifs and so on. Even the materials are implicated in the full matrix of *praxis* to such an extent that they possess an immense semantic thickness or resistance. Most importantly, one does not find making as such ('technology'), rather a *techne* is always the making of something — shoes, houses, statues, a speech.

The significance of this knowledge (*techne*) to the eventual formation of the eidetic structure that is Euclidean geometry lies in its semi-autonomous character — it is constantly involved with the measures of the topography of *praxis* as a matter of their efficacy, ranging from closeness of fit to beauty or depth of meaning. The movement from these concerns to those of cosmic justice is most obvious in the symbolism attached to the measuring-rod and chord in the ancient Near East, which is granted to a Mesopotamian king by a god as a mark of rulership (e.g. by

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Innana to Zim-ri-lim at Mari (Parrot, 1956–59, II.2, figs. 47 & 48, pls. VII–XIII; in colour, Lloyd 1974, 134–5), by Shamash to Hammurabi atop his stela of laws (Moortgat 1969, pl. 209, see also pl. 201, the Stele of Ur-Nammu); eventually, a golden rod is carried by the angel in the Heavenly Jerusalem of Revelations 21:15). The suppliant posture of the king in such scenes implies less an empowering than an entrusting with the measure that is justice, that the king is beholden to a divine order in its administration. The architectural significance of the measuring-rod and chord is perhaps most clearly evident in the symbolism of foundations. Along with gates and materials, the most frequently-mentioned aspect of architectural ordering in the texts is the foundation, whose laying is attended by concerns for stability and precision as well as by rites and deposits. It is this which appears in the stars and is then drawn in gold upon lapis lazuli for Gudea in his dream (Jacobsen 1972, 205); and it is the foundation which attracts the symbolism of the world-order as a temple in Jahweh's response to Job (*Job* 38 ff., a post-Exilic addition). The 'design' or laying-out of a temple differentiates this global paradigmatic background into rooms more directly responsive to customary expectations of decorum and building-practice. Accordingly, the guide for the measures that lie at the heart of a *techne* is the typicality of *praxis* itself, commonly called 'use' (Plato, *Hippias Major* 295d).

For us, 'use' has been compromised by 'utility', particularly in its Baconian rendering. By calling it 'typicality of *praxis*' I want to emphasize that the measures of a *techne* are only partially determined by questions of fabrication; rather, the key to these measures are the customary postures or gestures, distances, groupings, the distinctions and hierarchies of human situations. For example, discourse is customarily face-to-face; dining is customarily inflected towards the manners of host/guest and involves the often elaborate symbolism of food-preparation and of either hunting or cultivation; the house is customarily the institution which is most consistently present in architectural and urban representation. The paradigmatic dimensions of this typicality are also the basis of the larger 'symbolism', since what is always present in such situations is the exchange between the given conditions and the historical possibilities. There is an arbitrary element in any symbol; and a symbol is less illuminated by looking at its intrinsic qualities (a mountain, for example) than by looking at its modes of use (e.g. as a throne-base, or in poetry), which are culturally specific.

It is in these terms only that one can grasp the architectural and urban order of pre-*logos* cultures, for whom language, and particularly writing, were not the measure of all representation, but rather one representation among many, and one restricted to a small sector of the society — certainly the scribes, probably the priests, and possibly the court. For example, despite a completely unrecoverable 'liturgy' — and reservations regarding the accuracy of Mellaart's reconstructions (Mellaart 1967) — the shrines at Çatalhöyük vividly articulate the typicalities of *praxis* at two levels. First, they are obviously reinterpretations of the house. The house seems to act as a global institutional metaphor, suitable significantly for being with the gods — therefore for being in general, the closest thing here to a 'cosmogram'. The typicality of the house is evidently explicitly understood, to judge from the famous 'plan' recovered from the wall of shrine VII.14 (Mellaart 1967, figs. 59, 60, brief description pp. 176–7). At the next level of articulation, one sees that, within the global arrangement of house, the relationships with the plastered crania of bulls and goats, posts with horns, and a female figure are governed by orientations and distances related to postures and stances of encounter, propitiation, communication. For these purposes, 'house' constitutes a remote background.

It is important to recognize that the communication 'happens' in these distances. The concept 'city-as-image' promotes an assumption of being able to reduce the differences of an urban order to the representational level of purely symbolic relationships (through the medium of iconography). It would be better to think of the urban order as built upon distinctions and distances, each endowed with a content rooted in the concreteness of *praxis* and demanding a considerable conceptual leap to simply group according to, for example, the relationships displayed in a plan. It is only paradoxical to the conceptual imagination to recognize that these distances carry the content of what is available for symbolization with respect to the whole (and are what make a plan such a compelling 'image'). The most fundamental distance of this kind is that between humans and their gods. It is for the sake of this question of the nature of the whole that the theme of the 'city-as-image' is adduced; but it seeks to translate into a figural *unity* what I would prefer to see as a *continuity* of differences/distances/distinctions.

Whether a city is rooted in the solidarity, allegiance, obedience or convenience of its peoples, the whole must always involve a dimension of remoteness or anonymity. After the natural conditions, most remote is the urban and architectural order, which is

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also the most stable institutionally, acting as a structuring and orienting embodiment of the universal conditions for the sake of *praxis* and its possibilities in history. The city's capacity to act as a receptacle for cosmic orientation is only secondarily a matter of the exchange between physical extensity and symbolic centrality (which in any case is hardly ever manifest literally). Rather, this should be seen to be a consequence of the authority of the remoteness-as-whole in the communicative distances/distinctions. To this even the kings and priests pay obedience (and from its continuity arises that of Euclidean geometry).

The sequence from the distances of *praxis* through measures to the remote background is evident in palaces, which inevitably find themselves mediating the higher sacrality of the temple with the more secular order of the town (often making it difficult to clearly separate temple from palace). The edifice at Ur designated by Woolley the *gipar-ku* (Woolley & Mallowan 1976, 5–9, 40–63, pls. 1–9, 118, 119), for example, declares a near-square divided into two with its primary walls containing the curious circumambulatory corridor, within which are found clusters of shrines and other rooms organized around courts. The clarity and subtlety with which this is accomplished precedes the advent of geometry by two millennia; and the build-up of its order transpires in a dialogue between the paradigmatic, remote background and its capacity to be articulated down to the level of store-rooms. Similarly, the next stage of articulation, the ornament, takes a room as its global background, even if its own themes are far more archaic than the newly-built edifice. The ornament, finally, is shared by the furniture and regalia which qualifies the *praxis* of the court in history.

The urban order at Ur does not display the sophisticated differentiation of the palaces, rather there are endless re-enactments of the courtyard house, grouped within the walls about the temple-palace compound — itself a grouping of such 'houses' (as are the Royal Tombs) grossly aligned, greatly enlarged in scale and more consistent dimensionally. Some urban differentiation by activities (*praxes*) appears to be a desideratum of new towns, as well as a circumstantial development of evolved configurations (e.g. artisans' quarters, etc.). At the apex of the symbolic hierarchy are two more 'houses'. The temple atop the ziggurat (whose great symmetrical flights of steps and landings permanently embody the exchange between proximity and distance) and the 'festival house/temple', or *bit-akitu* are both 'figures' for the town as a whole, to which they are reconciled through ritual.

This 'horizontal' distribution of 'houses' articulated 'vertically' (symbolically) through differentiation from foundations to ornament, and from not-city through city to temple, is one way in which the topography of *praxis* sets for itself a gradation of articulations in the architectural and ornamental background. The dialectics of periphery (alienation from the gods, disease, defeat, etc.) and centre (assured discourse with the gods, fecundity, well-being, solidarity, authority and justice, etc.) are re-enacted everywhere, not just atop the ziggurat, nor even only in the temple-palace compound nor even within the walls of the city. It is, as Plato said, a matter of degrees of participation; and, in the pre-*logos* cultures, the ruler and even the numerous gods are eccentric to a centre which has not yet been disclosed as such. Voegelin insists upon the '*tensional* closure . . . [as against] the fundamentalist fallacy of imagining the cosmos . . . to be spatially closed' (Voegelin 1974, 77). The tensional network of analogies arises from within the practical domain of concrete and metaphoric relationships and not from a concept of centre which is readily 'translated' into an architectural order through 'design'. The persistence of 'house' arises from a human finitude always already estranged within its conditions, even that part of the background it constructs for itself, and ever beholden to the distances that promise reconciliation.

Conclusion

The theme of 'city-as-image' is an aspect of the more general problem of how the whole of a cultural order is related to its parts. In a cultural present which regularly renders the whole of the order as 'globalization', I have argued for the opposite tendency, for the consideration of how the particulars of *praxis* embody a universality that is culturally specific:

1. To the extent that 'city-as-image' ought to be understood as 'city-as-concept', it is appropriate mostly to post-Enlightenment cities, prepared in the Renaissance. That is, it is mostly an artefact of recent western interpretative procedures (including such invented concepts as Eliade's *axis mundi* applied to urban centres). An anticipation of this is found in the Late Hellenistic context, for which the necessary preparation includes the *logos* culture of the *polis* as well as the capacity to grasp the whole as 'cosmos' (traditionally dated to the sixth century BC). These appear to be prerequisites for a proper axiomatic geometry.
2. For pre-*logos* cultures, the problem of the whole arises from the concrete judgements of *praxis*,

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whose institutional order (typicality) is the principal vehicle of mediation with the universal. As a matter of urban and architectural order, one sees a hierarchy of such interpretations: from the concrete distances of *praxis* to the measures of making to the remote, universal background. This stratification is preserved in such textual formulations as those of Plato or Cassian.

The stratification itself points to a continuity-within-difference rather than to the unity of a concept (the emphasis upon the distances of *praxis* is intended to challenge the synthetic pretentions of concepts). Plato's 'highest good' — or Cassian's 'Jerusalem' — as a name for this continuity directly contradicts 'city-as-image' as a possible name. What is being named here is not a concept or an objective and certainly not 'form' or an urban plan. It names the content of the continuity itself, which is nothing more or less than the continuity of reality — the constant struggle to reconcile historical *praxis* with what is always already there, the universal conditions. The universal cannot be taken up as a resource for exploitation, appropriated through mere symbolism, but only approached through the particular institutional structures of *praxis*, which at most are oriented by symbols: 'it is clear that no universal exists in separation apart from its particulars' (Aristotle, *Metaphysics* 1040b26). On this basis, the order of *praxis* is the basis of all forms of ordering, even the most radically conceptual.

With respect to the 'methodologies' of both archaeology and architecture, I am arguing for less reliance upon the generalizations of concepts which flatten the difficult reality. An attunement to the institutional order of *praxis* exposes the rich matrix of relationships and exchanges, the structures of continuity, which are ontologically rather than epistemologically precise. In many ways, a settlement or city is best understood as a vehicle for the resolution of conflict. A city is a contingent, vulnerable thing with respect to its deeper context, and happens fundamentally within the concrete mediative processes of *praxis*.

Appendix: Preliminary classification of urban 'cosmograms'

The basic assumption of the following remarks is that accounting for configurations which morphologically appear to directly embody a symbolic figure is a matter of accounting for what happened to the continuity of *praxis* present in cities which display the more customary mediative order. Once one disposes of 'cosmogram' or 'city-image' as evaluative terms, one realizes that the proposition would not have been expressed this way for practical purposes either. Rather the proposition would have taken the form of a relation between city and temple, the edifice or precinct with the highest paradigmatic claims. Accordingly, combinations of each of these gross categories often appear (for example, A.3, B.2 and B.3).

A. Some of the places in which 'cosmograms' appear:

1. *In literature*, or in such explicitly symbolic representations as the city-icons on the Tjehenu, or 'Libyan Booty' Tablet (Kemp 1989, fig. 16; photo in Davis 1992, fig. 53), the labyrinth in Chartres Cathedral and, from the Renaissance onwards, architects' speculations.
2. *Military camps:* The Neo-Assyrian example from Nimrud in the British Museum (Budge 1914, pl. XVI) is at one with the Roman Camp of Polybius (IV.31.10). Like hunting, war bore a ritual or ceremonial content (as in the Assyrian expression 'the dance of the young men'). Part of this appears to involve re-enacting the paradigmatic aspects of the home city whilst in a condition of estrangement and danger, and, in the case of Polybius, co-ordinating this with the structure of authority (which is also religious). Since a number of Roman camps became the nucleus of towns (Cosa, Timgad), it is possible to assess the relation between Polybius' text and its subsequent embodiment as a town. The Assyrian camps are, as far as I am aware, only attested in the reliefs — and few have a full cross, more have one 'horizontal' (or E–W?) street — and therefore may be the subject of idealization or symbolic representation such as our first category. Sargon II's new foundation — Khorsabad — shows only distant analogies with the camps (compare 'Sargon's Camp' in Botta & Flandrin 1849–50, I, 77; reprinted in Albenda 1986, pl. 137).
3. *Temple or Palace towns:* Angkor Thom and the South Indian towns articulated by prakara walls both depend upon kingship (not necessarily coercive). The first, however, is a temple-palace, whereas the second are more properly temple-towns. Nevertheless, they involve the superimposition of a temple topography upon that of a town, with little co-ordination except for the agraharas of the Brahmins (therefore see B.2 below). The primary order of the South Indian town resides in the infinite richness of its ritual cycles. Curiously, this reification of the temple-order seems to happen about the same time as the development of perspective in Europe. Baghdad of the

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Caliphate might also be adduced in this category.
4. Explicitly conceptual transformations of inherited symbolic figures into an actual city — most evident in Europe from the Renaissance onwards (A.1, B.1), but anticipated in Hellenistic perspectivity. Most characteristic of these is the vagueness regarding sacred and secular — the ease with which both lose their integrity to a theatrical mediation of concepts and references.

B. Some of the places in which partially-figured cities appear:
1. *Any city*, in accordance with the gradations of figuration/topography of *praxis*, above. There is a familiar form of this in the West that begins with Renaissance practice, characterized by Rowe as the intervention of the Tragic stage-set into a pre-existing Comic (Rowe & Koetter 1978, 14–15). The fundamentally ceremonial topographies of the Renaissance and Baroque periods eventually arrive at such wholly aesthetic concepts as 'City-Beautiful'.
2. *Conditions of fervency of symbolic attunement*, of which, in a Christian context, the monastery is perhaps the most important example. Well before the St Gall Plan, the embodiment of Heavenly Jerusalem was adduced for the congregations of anchorites in the desert under the term 'city'. Much of what animated the papal projects of *renovatio Romae* before and during the Counter-Reformation was seen in these terms, having the character of B.1 for practical purposes.
3. *The tradition of imperial foundations of a new town* creates conditions for heightening the paradigmatic content of the order; but surviving examples seem to indicate that this does not exclude the distinctions and differences of *praxis*. This would seem to be the case for Akhetaten, which O'Connor and now Mallinson propose to see as a species of temple-town (Mallinson 1999) inspired by the large-scale ritual configuration at Thebes, organised by Akhenaten's predecessor, Amenhotep III (Kemp 1989, part III). In all ignorance, I am inclined to see this as a large-scale temple-palace compound, which the rest of the town has been allowed to colonize — certain canonic aspects are emphasized or even inflated, others let be. In equal ignorance, I would see Teotihuacan in analogous terms, although its ritual precincts were evidently more 'public' than those at Akhetaten.
4. *Hellenistic cities*, as above. It may be that Persepolis deserves to be seen as a precedent for this style of thought, even if it was little-known and was, properly speaking, more of a palace than a town. The manifest ecumenic syncretism, wherein motifs — and the requisite craftsmen — from diverse segments of the empire (inscription of Darius I, Susa, in Frankfort 1970, 349) are combined in the configuration of four-towered hypostyle hall atop a stylobate-mountain and repeated everywhere displays a level of iconographic abstraction that anticipates Hellenistic efforts.

What is most evident in this list is how fundamentally uninformative it is. Everything important about such configurations resides in the particular circumstances of cultural context, the habits and customs which inform the distinctions and distances of *praxis*, the primary relationships or hierarchies which are emphasized in the overall order — to the extent this has even been thematized as such.

Bricks and Metaphor

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Modern city designers are heirs to a long tradition, reaching back through Renaissance to Classical times, of creating layouts which attempt to realize schemes lodged in the imagination. The Garden City movement of a century ago provides a familiar example of planning taken to a more transcendent level, no less the bringing about of an egalitarian social as well as environmental transformation of society (although this in turn became distorted in the face of political realities, eventually serving the ends of National Socialism: Ward 1992). City designers are not, however, imposing order on chaos. Beyond a certain scale, a degree of regularity or at least of recurring patterning in the built environment is probably inescapable, reflecting the fact that we occupy an orderly universe in which randomness is unwelcome (the theme is explored in Schaur 1991). Moreover, straight lines and square corners (scarcely meriting the term geometry) have an appeal which does not require the imagination to soar. That being the case, when we lack explicit contemporary testimony, what is it

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that tells us to invoke a higher order of abstract intentionality in the face of a layout in which we can detect a pattern; when are we entitled to say that a city is an image or symbol of something else? Are city planners and dreamers as old as cities themselves?

In the absence of clear written sources, we face an interpretational dilemma, laid for us by a fundamental characteristic of the human mind: the fuzzy pattern-matching ability of metaphor, as actively in search of meaning in our own minds as in those of the peoples of antiquity. Metaphor provides an escape from the tyranny of literal rendering and scope for the opportunistic utilization of coincidences. We can play the game at least as well as it was played in the past, and on the basis of ancient sources. It leads us on to a trap-door into a world of limitless and unrestrainable speculation in which the boundaries between conventional scholarship, naïve acceptance of coincidence and New-Age mysticism dissolve. Yet despite the danger of fertile over-interpretation, from henge monuments to Mesoamerican cities, it is hard to resist the challenge of inductive cosmology (I use the term in deference to Petrie's early contribution to cognitive archaeology, *Inductive Metrology*, published in 1877).

Even in societies which have left a good documentary record, the positing of abstract schemes to explain architecture can hover on the boundary of scholarly acceptability. As an example, I would like to cite the case of Philip II's Escorial building in Spain (1563–84). In combining royal mausoleum, monastery, palace and temporary accommodation for the whole court, it fulfilled a set of functions not unlike that of Pharaoh Rameses III's mortuary temple and palace complex at Medinet Habu in Egypt. Both were single-building settlements. One detailed and highly erudite study of the Escorial has claimed that the architect responsible for much of its development (though not its inception), Juan de Herrera, sought to make it, by subtle arrangements of its proportions, a recreation of Solomon's Temple at Jerusalem, as it was visualized at the time (Taylor 1967). Plans of the Escorial are provided over which are superimposed geometrical astrological designs and the figure of 'cosmological' man, showing convincing correspondences. Further support is found in visual allusions in some of the paintings. Since it is known, from a surviving list of the contents of his library, that Herrera owned many of the occult and Hermetic works which were current at the time, including a treatise on Solomon's Temple, the idea might not seem too fanciful. The author also pays attention to orientation, discovering 'that the building was aligned to the sunset on August 10, the feast of St Lawrence. That it cannot be observed because of the hills before it is immaterial; in fact, the secret has been better kept for this very reason' (Taylor 1967, 99). Yet a subsequent and equally erudite study of the Escorial, the building of which is well documented and over which the staunchly orthodox Phillip II presided, rejects this approach as wholly baseless (Kubler 1982, 128–30). One could retort, on Taylor's behalf, that Herrera kept the ideas to himself, knowing that Phillip II would not have been sympathetic. As a secret in the mind of one person the interpretation cannot be disproved. In the end, as with most 'alternative' theories, the reader believes it or believes it not, although at least it belongs to a time when we know that people did indeed visualize architecture in these terms, leading on to the thought that perhaps Kubler has been unresponsive to the full intellectual climate of the times. The question is thus not whether the ideas are historically appropriate, but whether they can be read from this particular building. For the more distant past, when it cannot be taken for granted that abstract architectural schemes are historically appropriate at all, consensus is even less likely.

The question of whose interest is represented by visionary schemes is another factor which hinders objectivity. Comprehensive planning brings out strong and divisive feelings today. In the study of the past there is a tendency to pass favourable judgement upon examples of striking layout, often possessing a marked degree of regularity, and to seek an edifying rationale. Yet this is perhaps undervaluing the degree to which society has been effectively served by less formal self-organizing schemes, the natural strength of which is now being better appreciated. They, too, can provide the basis for an image of the city of a quite different kind. I will return to this topic later. For now I would like to cite an example of contrasting viewpoints caught at a crucial moment of deliberation at a time before city planning had developed the unstoppable momentum which it now has, namely, the rebuilding of London following the Great Fire of 1666 (Fig. 1; Reddaway 1951; Porter 1996). The shortcomings of the old irregularly laid out medieval city were well appreciated at the time. Amongst the intellectual élite was enthusiasm for Renaissance city-building, which combined geometric planning with Classical façades to create a living link with the values of Greece and Rome which were becoming increasingly admired. Within the month several plans were drawn up of which six

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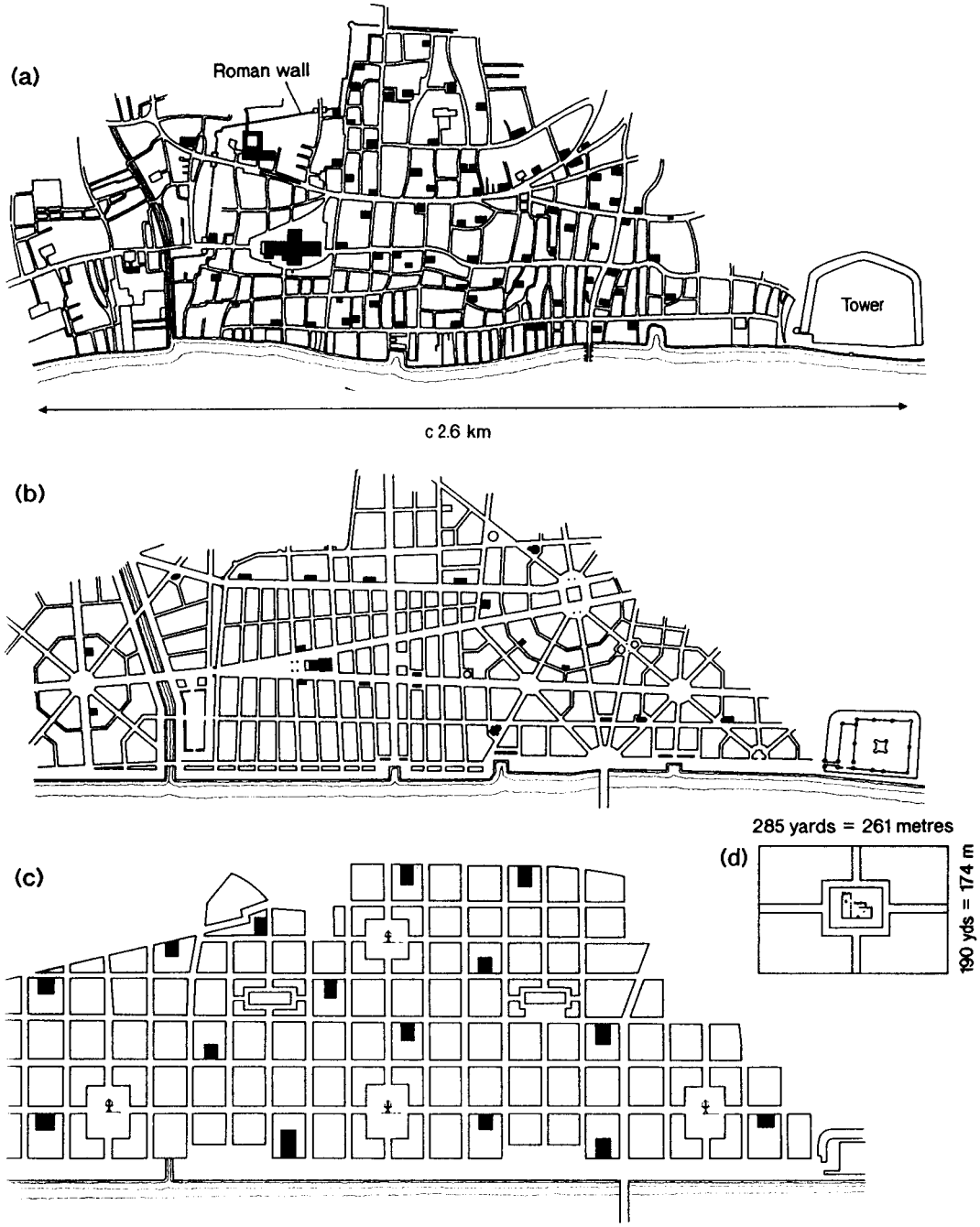


Figure 1. *Confrontation of the medieval and the Baroque, the planned and the 'unplanned': the area of London destroyed by the Great Fire of 1666, as mapped at the time by Wenceslaus Hollar (a), and two of the plans for rebuilding, by Christopher Wren (b) and Robert Hooke (c). The medieval street layout triumphed. Both Wren and Hooke were happy to relocate the sacred sites of London, the churches, which had survived the fire fairly well (and are marked in black). They also reduced them in number, from an original seventy-six (within the burnt-out area) to twenty-one (Wren) and fifteen (Hooke). The inset (d) illustrates one of the fifty-five parish modular units by which a third planner, Richard Newcourt, sought to rebuild London, including the areas beyond the fire. The four large open squares of Hooke's plan were to contain a fountain and a market. Medieval London had not developed wholly 'unplanned', for parts of the Saxon settlement had apparently been laid out on a grid (Vince 1991, 421). (This figure was inspired by March & Steadman 1971, 33, fig. 1.18, and draws on the plans published in Reddaway 1951, Schofield 1993, and Porter 1996.)*

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have survived, the most famous by Christopher Wren (then a Professor of Astronomy). All show a completely new street layout, either a grid on its own or combined with radial elements. (Interestingly, none of them thought of relocating the royal residence into the city, cf. Fig. 4.) Although they were admired by the king (Charles II), modern study of the deliberations of the day reveals that they quickly dropped out of serious discussion. The city merchants took control, and the city that they rebuilt, with the aim of reviving its fortunes as quickly as possible, was, in its plan (though with significant improvements in materials, street widths and administration), virtually identical to the old. The image which won the day was that of a smartened-up version of the city which had served them well in the past, which now gave them 'not only the finest, but the most healthy City in the World' (letter of J. Woodward to C. Wren, 1707, cited in Reddaway 1951, 300). This kind of city design, shaped by usage rather than by intellectual engagement, ought to be an equal partner in a discussion of cities built as images.

It is interesting to note, in passing, that a modern textbook on architectural mathematics (March & Steadman 1971, 32–3) cites an analogy between the 1666 rebuilding plan of Robert Hooke (Fig. 1c) and the rectangular structure of the cells of the sponge which Hooke had already discovered under the microscope. They comment that this was 'the first consciously designed cellular city, a remarkable and singular invention', and, one might add, an unusual addition to the range of images on which cities have been modelled (though I am not clear to what extent Hooke and his contemporaries themselves made the connection; is this a modern metaphorical reading?). Wren's own scheme must contain the potential (at the very least) for identifying harmonious sets of proportions and symbolism (remembering his background in astronomy), but whether anyone has sought to discover these I have not investigated. It is hard to avoid the feeling that an element of parlour game is involved in such exercises.

Of late, the ideas behind architecture and broader building layouts have attracted renewed attention in Egyptology. One side to this, pyramids, lies outside the scope of this discussion; the other is the varied architectural schemes of the New Kingdom, in which cities and palaces play a leading part. Here the attempt has been made to set the few examples we have within the theoretical framework for the study of ancient cities proposed by Wheatley in 1971. Drawing initially upon Chinese written and pictorial sources Wheatley sought to establish an ideal-type of ancient city in which certain recurrent themes were expressed in layout, architecture and ritual. The underlying idea was to reproduce on earth a reduced version of the cosmos in which leading cities were 'laid out as an *imago mundi* with the cosmogony as a paradigmatic model' (Wheatley 1971, 417), reflecting an underlying mode of thought 'which presupposes an intimate parallelism between the mathematically expressible régimes of the heavens and the biologically determined rhythms of life on earth' (Wheatley 1971, 414). The basic visible characteristics of these model cities should be an axial point, a more or less square perimeter delimited by a massive wall, and an axial arrangement of streets and quarters orientated by cardinal compass directions which, projected outwards through monumental gateways, reach to the four horizons, the north–south axis having the greater importance. The foundation of cities required careful thought and research (through the use of omens and oracles) to ensure that it was done in accordance with concepts of topographic harmony (*feng-shui*). Although China was the inspiration, the most dramatic and detailed examples of architectural fidelity to cosmic models are to be found in the cities and ceremonial centres of India and Cambodia. Wheatley sought to universalize this model for the ancient world, including Egypt, although here he was able to cite only very limited evidence.

At the outset it is obvious that Egyptian cities of the New Kingdom and later (insofar as we know them) are weak exemplars of Wheatley's ideas, for they lack some of the basic characteristics that he defined. At present we have evidence for the layout of four major cities of the New Kingdom: Thebes (where almost nothing of the main residential area on the east bank has yet been recovered, but where fragments of a sprawling short-lived town on the west bank have: Robichon & Varille 1936, pl. IX; Hölscher 1934, pls. 11–15), Memphis (where isolated fragments have been exposed: Jeffreys 1985, figs. 13, 15, 63; Giddy & Jeffreys 1993), Tell el-Amarna (where we have much of the plan of all parts, together with key documents for what was in the mind of its founder, Pharaoh Akhenaten), and Per-Rameses (the modern Qantir in the eastern delta, for which we now have the first results from an extraordinarily successful and large-scale geophysical survey of the site, now agricultural land: Pusch 1999). We can also add the early New Kingdom palace-town of Ballas, where a good part of the plan has been recovered (Lacovara 1981; 1997). None of these cities seems to have been set within a massive rectangular walled

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enclosure with monumental gates, to have followed a strict grid plan of streets, or to have been cardinally aligned. Indeed, Amarna and Ballas had no clearly demarcated perimeter at all, and the same might well have been true for the other three.

This unpromising picture does not altogether exclude the possibility that a degree of order was present which expressed transcendent ideas. Citing Wheatley as a point of reference, O'Connor has sought a more restrained expression of them in the New Kingdom cities of Thebes and Amarna. The royal city was, he states, regarded as an *axis mundi*, 'in which the divine creation of the universe was continually reenacted, the forces of supernatural chaos successfully resisted, and the great cycle of the supernatural renewal of nature and of the institutions of Egyptian society maintained in perpetuity' (1982, 19). This stands as a fair encapsulation of the function of a major Egyptian temple of the New Kingdom, but is it appropriate to extend it to the city outside its walls? O'Connor is explicit on this point. The royal city was laid out 'so that it would mimick the form of the cosmos, as it was conceived of at that time, and thus compel major aspects of city life to replicate the essential processes of the cosmos' (1989, 82).

We do well to pause at this point and reflect on Egyptian views of the cosmos. How Egyptian thinkers mapped it at one level is preserved for us, as texts and pictures, on the walls of the tombs in the Valley of the Kings at Thebes. Their carefully portrayed world is not an abstract counterpart of the Nile Valley, but a combination of the night sky and an imagined realm, with branching watercourses, caverns inhabited by spirits, and topographic referants cast up by fertile speculation, as with: 'The two great rocks in the midst of the Western Sea and whose name is "The Land of people who are at the end of the Earth". This is their city' (Piankoff 1954, 427). What real experience of geography could have given rise to this odd passage? Through this realm the sun-god journeys during the night and the day, sometimes beset by dangers, so that there is a strong sense of movement and direction, from east to west, the course taken by the sun, and of cyclic change, in the rising and setting of the sun, and its metaphorical counterpart in birth and death. This is a mental universe, far removed from earthly topography and not readily transferable as a template for the built environment, except perhaps in the east–west solar progress. It is a cosmos in which the actual form of the Nile Valley and its sacred places have no role, other than in providing a metaphor for the sun's mode of progress, by river-boat (in a direction perpendicular to the course of the river). It was not one of those 'mathematically expressible régimes of the heavens' (Wheatley 1971, 414) which could be modelled on earth as a sacred city.

These sources must count as the principal Egyptian portrayal of the cosmos, but other strands of mythology continued to exist independently, illustrating the power of context to dictate content. An elaborate poem on the gods Amun, Ra and Ptah embraces their cities, Thebes, Heliopolis and Memphis, with primacy given to the first pairing: Amun and Thebes. Thebes is 'the pattern for every city. Water and earth were in her from the beginning of time, when the sands came to limit the fields and to create her ground upon the high place at the earth's beginning' (Nims 1965, frontis., 69). This exemplifies a theme which recurs in Egyptian temple texts: that the world of Egypt commenced as a series of mounds which emerged from a primeval flood and upon which the gods first made their abodes, which became the sites of the leading temples and places of creation (Frankfort 1933, 28–31; Martin 1986). This element comes closest to one of the key features of Wheatley's model city, the *axis mundi*, as O'Connor has noted. Did it remain as metaphor or was it translated into constructional terms?

Natural mounds were part of the landscape of the Nile valley and delta and many settlements must have stood upon them. The myth presumably arose from this basic topographic fact. It is something reasonably well documented by geology for the eastern Nile delta, but Edfu and Coptos supply good examples from the south. Certain archaeological remains on temple sites can be interpreted as attempts at actually creating artificial sand mounds in further pursuit of this myth (Ricke 1935a,b), but for the royal cities of the New Kingdom the evidence is weak. At Thebes, the great temple complex of Amun-Ra at Karnak did indeed stand on a low mound. This was actually the remains of the earlier city, although the fact that the Middle Kingdom temple, which occupied only a fraction of the ground, was at the same level raises the possibility that it had been built on an artificial hill which, in the New Kingdom, became lost to sight. The new city of houses and offices, displaced from its former ground, spread over the adacent low-lying fields and, being now beneath the modern water-table, has so far proved unrecoverable. The metaphor of the primeval mound at Thebes could be maintained in texts but it was not a significant outward manifestation of the vast and irregular walled temple complex itself.

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This takes us back to a point made at the beginning: the escape from the tyranny of visions which metaphor provides, especially when aided and reinforced by symbols. People did not necessarily need to see or to build an obvious primeval mound in order to believe that one was present. Indeed, symbols proved to offer, at least during the New Kingdom, a potent means of subordinating not landscape to design but, quite the contrary, of design to landscape. The decoration of the same tombs in the Valley of the Kings, at least during the later New Kingdom, used symbols of cardinal directions to give a sense of east/west and north/south orientation regardless of their actual cardinal orientation (Wilkinson 1994). Once one entered the tomb and lost natural points of reference, symbols took over. It was an economic, pragmatic solution which removed the burden of reshaping the landscape which, in the case of the Valley of the Kings, was a highly uncongenial one. Moreover, in a major study of New Kingdom temples, Spence (1998) has developed the argument that symbolic orientation was used in the same way here. A setting-out ritual was performed which nominally re-enacted the process of stellar orientation. This was followed by laying out the actual building axis in most cases on a line at right-angles to the local course of the river. Symbolic orientation via elements of the temple decoration bridged the gap. Once inside the portals, all became consistent with cardinal orientation in a way that belonged to a much earlier interest which the Egyptians had taken in astronomical alignments, but no inconvenient burden was placed upon the builders. Awkward cardinal orientation was largely removed from city planning.

The major case history for ancient Egypt is the city of Amarna. Although a rich source in its way, its creator Akhenaten had evidently cleared from his mind the rich cosmic imagery which we know about from the royal tombs of the New Kingdom, leaving an uncluttered view of a material day-world animated by the power of the sun, and a night-world which was simply the dark and lifeless absence of the sun. (What survives of the decoration of his tomb at Amarna seems to show that he maintained this reductionist view literally to the end). The king's views thus left little in the way of old-fashioned cosmology to grasp at, even supposing that anyone had thought that a city could reflect it.

The boundary stelae in the cliffs which surround Amarna record the choosing of the site and Akhenaten's purpose. There is, indeed, a level of abstract idealization present. The new foundation (he does not refer to it explicitly as a city) is the sum of its temples, palaces and tombs. Its place in the world is defined by the stelae themselves, three on the west bank and three on the east (so the texts themselves proclaim). The eastern and western sides had identical distances, expressed with great precision: 'six river-measures, one and three quarter rods, and four cubits' (Murnane 1995, 84; the figures pose a problem of measurement: Schlott-Schwab 1981, 127–30; Uphill 1998). The precision is illusory, for the sides are very far from equal but the distances involved are so great that it is not possible for a person to observe this, although the fact that there are many more than three stelae on the east would have been obvious, likewise the fact that Akhenaten's tomb lay far to the east of the boundary, flagrantly ignoring his oath that it and everything else was to be inside. I take this as illustrating how it was not necessary for the congruence between ideal and reality to be anything other than approximate. The limits and the method of marking them are pragmatic — a straight slice across the Nile valley — and it has been elevated into a perfect, symmetrical scheme only within the formal context of the stelae.

That is my view, but it is possible to reverse the order of priorities and to approach what was laid out on the ground with a sense of obligation to find an expression of perfect order on the assumption that so idealistic a ruler would scarcely have failed to have incorporated one in his new city. Thus Mallinson (1999; cf. 1995) has laid over a modern map a sunray-like net of alignments which, originating at the royal tomb and traversing cliff and valley, links salient points in a scheme of harmonious proportions. The underlying image is one of geometrical purity rather than of specific symbol and is thus particularly abstract. It implies a visualization and control of landscape of an Olympian intellectual kind which created an effect which was invisible even to its creators. As with the Escorial case, one is invited to imagine a small group of people (or just one person) deriving satisfaction from an esoteric scheme of which the outside world generally remained ignorant. At least with the Escorial the ideas themselves are documented in the literature of the time and so gain plausibility from the intellectual context of their day. In the case of ancient Egypt, where they are not, we are asked to take them on trust, for there is no explicit written evidence that the Egyptians approached landscape in this way. On the other hand, Mallinson's scheme is not open to formal disproof. Much depends upon the individual reader's predisposition towards pattern-recognition.

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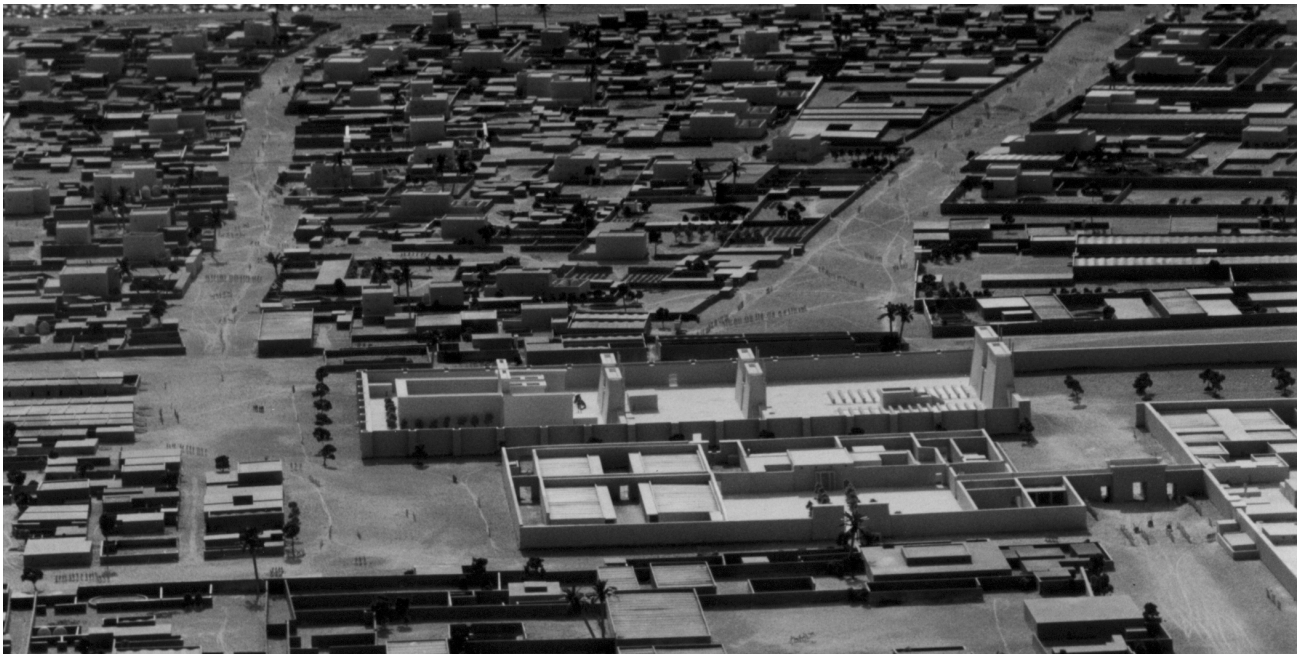


Figure 2. *Model of Amarna, showing the boundary between the royal and private spheres. The main city thoroughfares converge towards the rear of the royal buildings. Photograph by David Grandorge.*

A few statements in the boundary stelae have also been taken as pointing to a higher level of significance in the Wheatley sense. They are terse in the extreme but O'Connor has read them as meaning that the city is a representation of the cosmos, all that the Sun's Disc created, but in what way this could be other than a verbal metaphor is hard to follow, given the Aten-theology's minimalism. He uses other Amarna sources to show that the king's progress and participation in ceremonies were made into an analogy of the rising and shining of the sun's disc; his progress through a ceremonial day in the city analogous to the daily course of the sun.

The king as the sun was a piece of stock poetic analogy (and one not confined to ancient Egypt). Thus, a century earlier, the newly appointed Vizir Rekhmira had said of his king, Tuthmosis III: 'I [saw] his person in its essence, Ra, the lord of heaven, the king of the two lands when he rises, the Aten/solar disc when he shows himself' (Davies 1943, 81, pl. XI.13). In the diplomatic correspondence of the time (the Amarna Letters), vassal rulers of Palestine addressed Pharaoh as 'my sun' (although rulers of equal standing, who could carp in a blunt and disrespectful fashion about the meanness of Pharaoh's gifts, did not). Is it necessary or reasonable to see sycophantic metaphor dictating the layout of a city which actually displays the minimum of formal positioning of buildings? The infinite flexibility and adaptability of metaphor enabled any setting to be appropriate to the king's solar persona. There need have been no programme to create with building materials an 'other' world of cosmic order in a city which accommodated royal display.

The built city occupied only a tiny part of the territory defined by the boundary stelae. For a city laid out on a completely empty and relatively flat piece of ground, what is most remarkable is the weak degree of visible overall control of layout (Figs. 2 & 4). There was no fixed perimeter (other than that provided on the West by the curving river bank) and thus no gates; there was no grid of streets. To judge from fragments of other urban plans from within Egypt of the New Kingdom this was not unusual. The argument that haste in construction led to carelessness in layout carries little weight. Formality was created through choosing one principal straight line (Royal Road, a modern term). A number of large rectangular buildings with massive (and largely undecorated) façades were aligned to it, creating a rectilinear plan in this part, though it scarcely merits the term 'grid'. The laying out was done with a fair degree of approximation and allowed to become more strongly skewed further back. Several of these royal buildings were aligned towards the river to which (with some difficulty because of the curving course of the river bank) Royal Road, the main route through the city, ran parallel. The choice of ground

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for the two main temples was probably dictated by local topography. They occupy a slightly raised area of desert from which, to north and south, the ground slopes downwards. On a modern map their position fits a major geometric scheme based on two of the boundary stelae (Mallinson 1995; 1999; Uphill 1998) but this could equally be a coincidence which would not have been apparent at the time. The northern boundary stela was hidden from view within the city by a substantial stretch of intervening cliff.

From a similar sense of obligation to demonstrate that, despite first impressions, some kind of formal organizing scheme must be present (if not quite the Wheatley model), O'Connor has also proposed a functional division of Amarna: into a northern Sacred City and a southern Secular City (1989, 83–5). This is a fairly subtle distinction. The secular part contains one of the principal temples and, conversely, the sacred part one of the residential areas which is, in its plan, very similar to the main residential district in the other. The two identifiable houses of priests are also in the secular part. If there was a division of this kind then it clearly was not rigidly maintained and is not to be read with any sense of inevitability from the city plan. Moreover, it is hard to see it as an initial organizing principle. But it is pointless to quibble, because this is not at all how Amarna is presented by Akhenaten in the boundary stelae. There, *everything* between the boundaries is the sacred ground of the Aten, and the only buildings that mattered were the palaces and temples, each and every one of them. The distinction between the sacred and the secular lay in the planes of encounter: the former the mental world of the texts, the latter the day-to-day on-the-ground reality, with degrees of seclusion (presumably enforced by policing) in and around the royal buildings. It is abundantly clear that the ancient Egyptian mind was as capable of embracing simultaneously an idealistic set of referants (in their case derived from theology) and a compromised pragmatic one, as we are; indeed, this is the essential tension which metaphor requires and exploits.

The artists who decorated the walls of temples and tombs at Amarna, as was normal in ancient Egypt, spread their designs on wall surfaces in long horizontal registers. The designs often included elaborate portrayals of buildings, and if one had only these as a guide and lacked the excavated site altogether, one might deduce that Amarna was an exemplar of geometrical order. Le Corbusier included a fragment of one such scene from Amarna in a series of examples to illustrate the theme of 'order' in cities (1929, 25). But apart from the Central City, where the sheer size of the major buildings imposed a degree of rectilinearity, signs of an underlying master plan are conspicuously absent. Again we see how the vision of the city depended upon the plane of encounter: in art it was idealized as a geometrical scheme, as actually built it exemplified a very different kind of order.

A major portion of the city, ouside the royal sphere, consisted of residential areas (Fig. 2). Although they must have been largely built within about ten years they display a complex informal order that arose, not from premeditated planning but from local negotiated activity, done whilst a pre-existing social order transferred itself and settled into its new home, seeking as much convenience as was possible. In recent years, close attention has been paid to understanding better the dynamics by which unplanned 'organic' settlements come into existence (e.g. Schaur 1991; Erickson & Lloyd-Jones 1997). This has been done partly by case studies (often in developing countries and including shanty towns) and partly through computer simulations which use rule-based procedures. Because it is recognized that, in some way, this kind of settlement often successfully matches the character of the life of its community (it 'works'), the ultimate purpose of such studies is to aid in the better planning of future settlements.

> Beneath the apparent chaos of the modern squatter settlement, there is often a clear consistency of form and urban structure which varies from place to place. Such consistencies derive at the local level from the relationship between urban form and social processes. Local spatial customs and unwritten social codes determine the layout, spacing, and growth of houses, and the development of plots and settlement form (Erickson & Lloyd-Jones 1997, 906).

From the way that social processes map into urban form one can say that such settlements build themselves as images, not of an élitist vision but of actuality.

Figure 3(a) is an example of an artificial settlement created by computer (after Erickson & Lloyd-Jones 1997, 916, fig. 5). The program follows a set of rules (which incorporates an element of randomness) for piecemeal addition of house-and-garden units to a starting configuration of a single road along which lie three fixed starting places (asterisks), and (a key element) simultaneously allows the development of convenient pathways to modify the placing of new units. Figure 3(b) is a schematic rendering of a part of Amarna (which uses a degree of intuition as to what was 'house' and what was 'court-

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yard'). Because the site was an open piece of desert there were no existing property boundaries to influence people's decisions as to where to enclose ground and build houses. Instead they seem to have followed a form of (instinctive) rule-based behaviour in colonizing empty space of which a simple but vivid example is to be found in the way that people spread themselves on seaside beaches (discussed in Schaur 1991, 22–3). Plan (a) differs from (b) in that the cellular units of (a) are all of the same size and influenced only by the general dictates of the program. They are autonomous. In (b) differences in wealth and status create houses and courtyards of different sizes, and it is highly likely that family and economic ties have strongly influenced the placings of individual houses. The proximity to one another of houses of all sizes is a constant feature over the whole city. The plan can be seen as a spatial representation of a society which was itself an agglomeration of extended household clusters. This is a theme explored by Lehner (2000), who sees the concept of fractal geometry as providing a metaphor of how ancient Egyptian society organized itself. Amarna is a mapped image of the society that produced it, one which maximized group interaction across a wide social spectrum.



Figure 3. *The colonization of empty space by rule-based procedures: (a) an artificial settlement created by computer simulation (redrawn from Erickson & Lloyd-Jones 1997, 916, fig. 5); (b) a fragment of the main residential area of Amarna (after Kemp & Garfi 1993, sheets 6, 7).*

In allowing this process to dictate settlement form the Egyptians of the New Kingdom were turning their backs on a tradition of orthogonal laying-out of new towns. The attitude which had lain behind this is hard to assess. We are inclined to approve of it in whatever guise it appears. 'Culture is an orthogonal state of mind' (Le Corbusier 1929, 43). Orthogonal planning was used by the Egyptians, not surprisingly, to lay out the interiors of fortresses and work camps, but also larger towns (always exemplified by the Middle Kingdom town of Kahun: cf. Kemp 1989, 149–79; Czerny 1999, 17–29 supplies more information on one of the examples). Was there more here than a liking for neatness, control and ease of construction? The use of mud bricks (which were often quite large) and of builders' lines tended inevitably to create straight lines and squarish corners. Yet unlike the grid layouts of Classical and Renaissance cities there seems to have been little or no interest in designing façades to modulate the stark rhythm of intersecting streets. These are the layouts of barracks. The one aspect that should make one pause before judging that the effect striven for was of a neat job quickly done is that some of the planned settlements were laid out with cardinal orientation, and not all of these were dependencies of pyramids for which this was essential. Perhaps the most striking example to date, on account of its remoteness, is the workers' settlement at Qasr el-Sagha on the edge of the Fayum (Sliwa 1992). Yet even if there was a foundation ceremony for secular settlements at this time, its purpose could have been limited to that of endowing the act of creation with sanctity which had no implications for internal detail. Be that as it may, a preference for orthogonal planning was a passing phase. By the New Kingdom it had lost its attraction, except as a way of laying out the barracks-like villages of state-employed workers, of

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which Amarna itself possessed two (neither of them with cardinal orientation).

The residential areas of Amarna are conspicuously absent from the boundary stelae, but this should not be taken to mean that they did not exemplify an ideal, only that they were not part of the one in the king's mind. Not all ideals lie in the realms of the gods. A number of short texts (the '*Miscellanies*') have survived from a century or so later which sing the praises of certain cities, and acquaint us directly with more earthly thoughts of prosperity, security and general well-being which are evoked in dwellers and visitors alike (Caminos 1954, 37–8, 73–5, 101–2, 153–4, 333–5, 505; Lichtheim 1980; McDowell 1999, 157–8). Granaries are full, lotus-buds cover the ponds, the young people wear their best clothes every day and braid their hair, the army brings gifts to the king, foreigners sit at ease. Whilst not forgotten, the royal buildings attract a simple glimpse of splendour: 'beauteous of balconies, radiant with halls of lapis lazuli and turquoise' (Caminos 1954, 101). As a variation some texts express a longing to be present in the city of the writer's choice.

The language of prosperous contentment finds a counterpart, in some of the same documents, in idealized descriptions of private estates. Shaw (1992) has explored this theme in detail, relating it specifically to the residential districts at Amarna. When one adds to them the large royal compounds given over to centrally organized storage and production, and the broad (if irregular) streets and spaces in which soldiers and citizens could display their participation in prosperity, there is no reason why these parts of Amarna could not also have provoked the type of admiration that the *Miscellanies* contain.

There is a strong temptation in considering the theme 'were cities built as images?' to reflect immediately upon grandiose and essentially authoritarian projects in which all-powerful rulers or architects convert into a built reality abstract schemes, which might go beyond social élitism and derive from esoteric, privileged knowledge from which the rest of the population is excluded. Our own preference for seeking out schemes of this kind in the ruins of the past should not be allowed to obscure the likelihood that the bulk of the population had images of their own, of a more homely nature. These they shaped into neighbourhoods which articulated more democratic aspirations of convenience and domestic contentment. From the point of view of intellectual history such images are banal and resistant to analysis and development into grand theory, but it does not make them any less real or unworthy of inclusion in a study of what have been the shaping forces of cities. The *Miscellanies* present the built city not as bird's-eye diagram or as a set of vantage points for sweeping vistas, but as neutral theatrical backdrop to happy prosperous bustle. The longed-for Memphis is a living human community which the writer wishes to join, not a set of visualized buildings. He wants to see people rather than walls. The image of the city is society itself.

The city as an abode of peace and plenty remains an image as appealing now as when the *Miscellanies* were written. No modern politician or social commentator could ask for more. The fact that it could be expected in cities which were probably all 'self-organized', as was much of Amarna, underlines the fact that planning and architecture are only two variables in a far more complex mix of factors which might, or might not, bring about this ideal. Whilst the history of planning can be written as the emergence of enlightenment, such a narrative is about aesthetics more than the quality of urban life.

Through contingency as much as design, and convergence from very different origins, Amarna took on a shape rather like that of medieval London, a riverside city of roughly the same size and estimated population (Fig. 4). Both display a somewhat disjointed compromise between the sovereign claims of royal power and its isolation. Whereas at Amarna the king planted a set of royal buildings and left the rest of the population to colonize (to use Peter Carl's term) the adjacent ground, at London kings (and the monastic orders) built around the edge of an existing settlement which had recolonized the old Roman city. Beyond one edge lay Westminster, where 'Secure in his semi-rural palace, the king could warily contemplate the city down-river' (Schofield 1993, 41). At the opposite end lay the fortified palace of the Tower. The existence of these places which straddled the 'secular' city provided the opportunity for grand processions, particularly at the time of coronations, which articulated the sometimes uneasy relationship between the royal family and the citizens (Hedley 1972, 141–2). As the course of the rebuilding after 1666 showed, this London that had grown up piecemeal formed an image that could not easily be abandoned, either by the court or by the citizens. In the building of Amarna a mental template of the same kind, which accepted that the royal and citizen spheres belonged to different categories which did not require integration, seems to have been at work, too.

In the concluding sentences of his book, Wheatley briefly offers an evolutionary perspective. From being underpinned by a universal cosmo-magical

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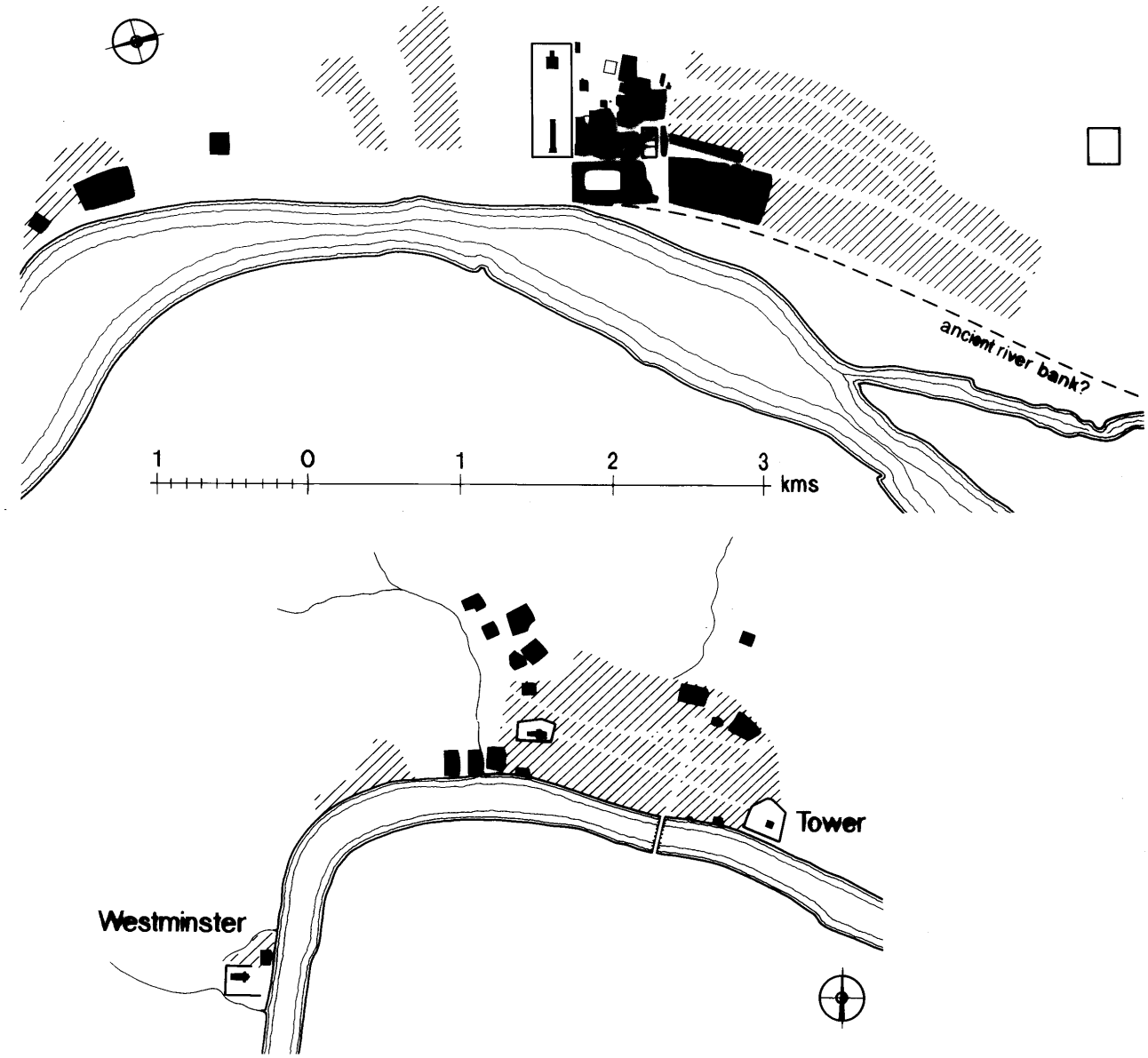


Figure 4. *Amarna (top) and late-medieval London (bottom) drawn to the same scale. Buildings in solid black are those of controlling organizations: palaces, temples, and storehouses at Amarna; palaces, castles and monasteries at London; hatched areas are essentially residential. Neither city displays a unified integration of the two spheres. Both cities arose from numerous local decisions, and both are images of societies with dispersed decision-making and a strong degree of self-organization. Despite the huge difference in the spans of time involved (fifteen years and a thousand) similar processes have converged towards a basically similar structure. (The London map is compiled mostly from Schofield 1993 and Vince 1991.)*

rôle, from Hellenistic times onwards, cities in the Mediterranean, the Middle East and then in medieval Europe came to develop, initially as an aberration from the norm, a civic unity reflecting human-centred considerations. This simple universal view of development is not supported by close study of the evidence. The almost total subordination of cosmic ideas to pragmatic considerations in city creation is to be found much earlier in ancient Egypt, as in many other societies. It reflects a broader phenomenon of great significance: the early pragmatization of religion. Those societies which have striven that much harder to convert cosmic dreams into real cities were probably quite unusual.

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The Image of the Roman City

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> In vain, great hearted Kublai, shall I attempt to describe Zaira, city of high bastions. I could tell you how many steps make up the streets rising like stairways, and the degree of the arcades' curves, and what kind of zinc scales cover the roofs; but I already know this would be the same as telling you nothing. (Calvino 1979, 13)

> *Everything* comes together in Thirdspace: subjectivity and objectivity, the abstract and the concrete, the real and the imagined, the knowable and the unimagineable, the repetitive and the differential, structure and agency, mind and body, consciousness and unconsciousness, the disciplined and the transdisciplinary, everyday life and unending history. (Soja 1996, 56–7)

There is an increasing awareness that the study of Roman culture in the West has been in the past tied into the Orientalist approach to Eastern cultures. Much earlier scholarship was written with the intention to create an image of Rome that coincided with the intended forms of a modern Western 'civilized' state in contrast to the Orient. The study of Roman towns is no exception and was closely allied to the development of town planning in the twentieth century. The Town Planning conference in 1910 included sessions on the ancient city — later to be written up by Francis Haverfield (1911; 1913) in his influential book *Ancient Town Planning*, which has shaped the debate and is replicated by a recent book by Owens (1991; Laurence 1994a). Rome's colonies were seen as models for new city forms (e.g. the Garden City or the New Towns of the UK); at the same time modern notions of planning were read into the city forms of Graeco-Roman culture isolated from any Punic or Near Eastern influence. These views created an image of the Roman city as regular and civilized, whereas at the same time Orientalist discussion of the Arab-Muslim city represented its object of discussion as irregular and anarchic (Al Sayyad 1991). A counter argument to this epistemological framework was made by the architect Joseph Rykwert (1976) in a book that set out to return architecture from the sterility of modernism to include a symbolic meaning to all its elements. The book has been adopted as 'interesting', but tends to be ignored in favour of a dialogue that is still engaged indirectly with the Orientalist approach to the Arab-Muslim city. There is clearly a need to break away from this historiographical tradition to create alternative readings of the urban form of the Roman empire that are not tied to its reception within Western modernity.

An aesthetic cosmology

The image of Roman town foundation is overshadowed by the mythology of Rome's founder Romulus — said to have been the creator of *Roma Quadrata* on the Palatine in 753 BC. The important point of this mythological tradition is that it emerges in the fourth to third centuries BC, when Rome was founding colonial towns laid out in geometric or orthogonal patterns (Wiseman 1995; Humm 1986). Both the idea of the mythical founder and the ideal of a geometrical pattern had their origin in Greek culture from whence they were incorporated into Rome's history. Aristotle (*Politics* 1276b.24, 1330a.34–1331b.10) identified a debate over the nature of urbanism stretching back to Hippodamus of Miletus in the fifth century, and this was still active at the time of writing in the fourth century. Aristotle's imagery of the city emphasizes aspects of health, and defence, but also an aesthetics of city form. The site reflected the political form of the city: citadel sites were seen as suitable for monarchies or oligarchies, whereas level sites were associated with democracy. Aristocracies in contrast needed several citadels. The streets should be in grid form, but restricted to certain areas. The temples should be prominent, overlooking the city, and the walls not only provided defence but also ornament. This was clearly an image or aesthetics of the city. Rome could have been viewed in its monarchical phase of *Roma Quadrata* as centred on the Palatine with its king Romulus. The later expansion of Rome

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gave it a number of citadels to correspond with Aristotle's ideals of the aristocratic city during the early Republic. In contrast to Rome, the egalitarian ideal of the colony, evenly divided often on a level site, symbolized the equality of Roman citizenship. A good example is Minturnae, founded in 296 BC. Not all colonies corresponded to this ideal, however, since there was always an element of choice, and Aristotle's views should not be seen as a dogma of city foundation but as part of an epistemological debate which the founders of towns could draw on or ignore.

The ancient dialogue over city foundation does not seem to have been resolved, but continued as long as cities were actively being founded. Vitruvius' *De architectura* is above all a treatise on how to create a new city, drawing on earlier debates and examples from both the Greek and Italian traditions. The work has been dissected to explain the structure of actual buildings but this overlooked the cosmological aspects that run right through the work. The city should be built on a site that is healthy — determined through the examination of the livers of sacrificial animals in the locality (4.1.9). The site is chosen with a view to defence, to the placing of temples and shrines to the gods, and to the location of buildings such as harbours, fora and baths (1.3.1). Once the walls are built, the site is divided up with streets aligned away from the prevailing winds for reasons of health. The forum is located in the centre of the city if it is inland, or close to the harbour if on the coast. Paramount in the placing of public buildings were the temples and shrines of the gods. The temples of the gods associated with the protection of the city, and those of Jupiter, Juno and Minerva, were to be placed on the highest ground from which the walls of the city be seen (1.6.7, 4.5). Other temples were to be distributed through the city: Mercury in the forum, Isis and Serapis in the emporium, Apollo and Bacchus by the theatre, Hercules near either the gymnasium, the amphitheatre or the circus. Following the writings of the Etruscan haruspices, Vitruvius urges that the temples of Venus, Volcanus and Mars were to be placed beyond the walls — to remove from the city the uncontrolled sexuality of male youths and women, the fear of fire, and armed quarrels respectively (1.6.7). This divine cosmology of the city was amplified through architectural form so that the images of the gods and their temples appeared to gaze upon the city and upon those involved in the rituals of sacrifice and the making of vows (4.5).

The three centuries that divide Aristotle's thoughts from those of Vitruvius were the period in which most of the towns of Italy were established. They do not entirely correspond to the ideals of either author. At Pisaurum, a colony founded in 184 BC on a grid plan (Livy 39.44.10), the temple of Jupiter was only begun ten years after the town's foundation (Livy 41.27.9–13). We should be aware that, in this earlier period, towns did not feature the degree of monumentalism expected by Vitruvius in the empire. Other examples, however, point to a fundamental cosmological consideration. Terracina, founded in 299 BC, was overlooked by the monumental sanctuary of Jupiter Anxur and connected to Rome by the Via Appia, which Humm (1986) has demonstrated to have been laid out along Pythagorean principles, with the alignment of the road focused on the Temple of Diana on the Aventine in Rome. In this case, mathematics and cosmography intersect in the creation of the new landscape of the Via Appia and the Pontine marshes. Colonies founded on hilltop sites, such as Cosa in 273 BC, can easily be identified with the Aristotelian and Vitruvian ideal of the city walls being within sight of the major temples. Those founded on level ground, such as Minturnae in 296 BC, have no such high points and the major temples were simply placed at a later date in the forum. In this case the landscape did not facilitate such clear cosmological considerations, but that did not prevent the foundation of a town at the river crossing, with a sanctuary located close to the estuary of the river. Here, the river and its god may have performed the cosmological function of a temple, with its god protecting the city from perceived enemies to the south (Braund 1996, 15–19 on conception of river gods).

Intentionality and cosmology

The cosmology of Vitruvius that stressed the role of haruspices in determining the place for a new city and the positioning of temples should be seen to be part of an age of religious creativity in the late second and first centuries BC (North 1990; Barton 1994, 33–40). The evidence of fragmentary bronze inscriptions from Roman cities referring official records or festivals confirms the place of cosmology in their constitution. The charter that set up the colony of Urso in Spain in the 40s BC (Crawford 1996, 393–454), provides detail of the place of cosmology within the structure of the city. All the annually elected magistrates, duumviri and aediles, included a haruspex on their staff alongside scribes, lictors, and messengers. The charter (*Lex Coloniae Genetivae Iuliae*) stipu-

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lated that the role of these magistrates was primarily concerned with the celebration of games in honour of Jupiter, Juno and Minerva and the other ancestral divinities. The charter also sets up two colleges of pontiffs and a college of augurs. A key role for the town's *ordo* (council) was to appoint magistrates to attend to the sacred sites within the city (temples and shrines) and to the celebration of games in the circus, the provision of sacrifices and the preparation of couches for the gods. Hence, within the law that established the town, attendance to the gods was emphasized alongside or even above considerations of land division or access to water sources. The actual rituals to be performed are not specified in the town charters, but a series of bronze tablets from Gubbio provide information on the interaction of ritual performance and the topography of the city in antiquity (for a text and translation see Ancillotti & Cerri 1997). Specific locations were the place of specific rites, with an emphasis on augury, sacrifice and prayer in a set format. The intention of all of these texts is to ensure the *pax deorum* through the consecration of the city at its foundation and the celebration of ritual after that foundation. Significantly, the celebration of ritual was emphasized in town charters and in other official texts inscribed on bronze.

The landscape of Roman archaeology

The key problem of interpretation is that the culture of Graeco-Roman antiquity has formed part of an 'invented tradition' in Western Europe that has emphasized a false continuity. Many of the cultural forms from the Roman past were re-invented in a different form in modern Western Capitalist cultures, with their antiquity as a justification for their persistence. It is difficult to disentangle the Roman past from its reception in the modern world, but what is clear is that the Roman past has little in fact in common with these modern cultural forms. For example, mathematics in antiquity existed in a close relationship to astrology, religion and cosmology in a way we might find hard to understand. Orthogonal town planning and centuriation of the landscape appear as abstract or rational forms, but involved compromises according to the physical shape of the landscape, and the position assigned to the settlement (Campbell 1996, 82–3) by other means that involved divination at some stage. Thus, the mathematical format is adapted to overriding cosmological considerations and is in fact closely related to these. Phenomenologically, the landscape of the Roman city is not very different from that put forward by Tilley (1994) for prehistoric Britain. This is not to turn Roman archaeology into prehistory, but to emphasize that the city in Roman culture should be understood within a metaphysical framework (Donald MacTaggart 1965) with a view to the reconceptualization of Roman material culture in relationship to its cosmological meaning in its pre-modern context (see Laurence 1994b; 1996). Hence when viewing the images of cities from antiquity, for example the recently discovered fresco of a city in Rome, the images of Puteoli and Baiae engraved on a series of glass flasks (Ostrow 1979), or the Severan marble plan of Rome (Rodriguez-Almeida 1980), we need to realize that the images of the city would have been seen within a framework of other values that gave meaning to the city as well as its individual features as represented in these images. A city in the Roman empire constituted an image or representation of ideas, imagination, and cosmology that was a vision of the cultural values associated with Rome in that place. Like *Thirdspace* in the opening quotation, the Roman city needs to be understood as a real-and-imagined cultural form — we as archaeologists have described the 'real' city, but ignored the 'imagined' city on which the 'real' city depends. In so many ways, the individual city in the Roman empire represented an image of the inhabitants' understanding of the universe, centred ultimately on the city of Rome itself.

Contestatory Urban Texts or Were Cities in South Asia Built as Images?

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> the ceremonial centre . . . projected images of cosmic order on to the plane of human experience, where it could provide a framework for social action. (Wheatley 1971, 478)

Gordon Childe, one of the most influential archaeologists of the last century, stressed a strong linkage between cities and symbolic functions (Childe 1950). Despite this prompt, Western-educated archaeologists began to rely heavily on economic-based interpretations of the plans of ancient settlements and cities during the 1970s and early 1980s. This shift in

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emphasis enabled them to escape cultural-historical and diffusionist models, but it led to a reliance on a series of statistical techniques with which to study urban space as illustrated by the work of Hillier & Hanson (1984) and Hietala (1984). Although such attempts were criticized by the anthropologist Edmund Leach, who warned of the dangers of archaeological inference and commented that 'an archaeologist with nothing to go on except a residual ground plan cannot infer from that . . . what was the generative syntactic rule' (Leach 1973, 338), they were widely accepted. It was not until the late 1980s that archaeologists too voiced their concerns that residual patterns of material culture were not necessarily mirror images of past societies and that they might have been distorted by non-economic factors (Hodder 1986, 3). Few archaeologists, however, have acknowledged Paul Wheatley's *Pivot of the Four Quarters*, which set out to 'redress the current imbalance between our knowledge of the contemporary Western-style city on the one hand, and of the urbanism characteristic of the traditional world on the other' (1971, xiii).

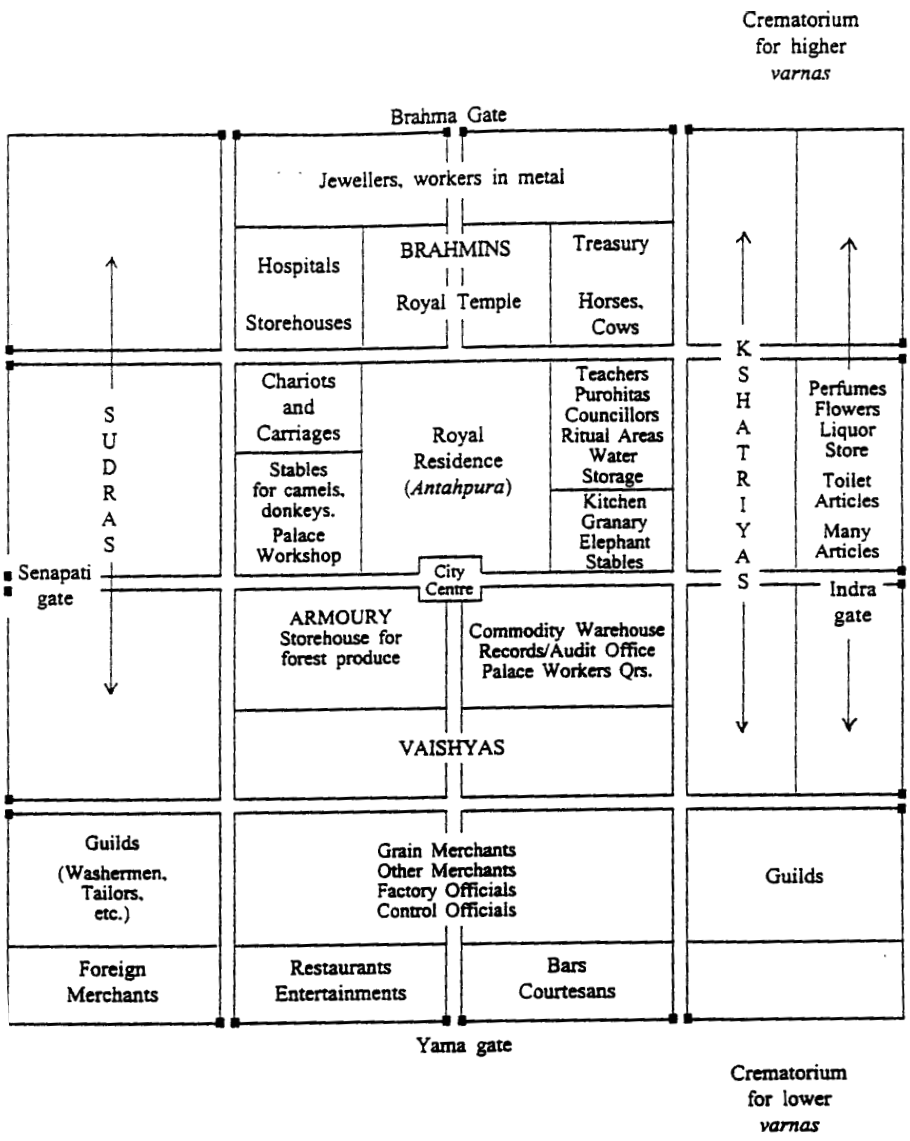


Figure 5. *An idealized city plan from the Arthasastra. (After Rangarajan 1992.)*

Drawing from an eclectic collection of sources, Wheatley argued that the 'traditional' city had been morphologically based on cosmo-magical symbolism and that it had developed from ceremonial, rather than economic, functions. He also stressed the inapplicability of economically-derived urban land-use models to cities 'structured in the image of a hierarchical cosmic order' (1971, 481). Wheatley's work drew from a century of scholarship, much of it derived from South Asian examples. For example, he cited the influential work of Binode Dutt, who studied historical town-planning texts and identified their influence in the plans of a number of historic South Asian cities such as Jaipur & Old Delhi (1925). A similar, more explicitly archaeological study of the plans of a sequence of eight Sri Lankan capitals was carried out by A.C. Hocart (1928; 1930). Both scholars clearly identified the use of the planning regulations contained within the *Arthasastra*, a South Asian text generally dated to the third century BC (Thapar 1961, 225; Trautmann 1971, 171). The *Arthasastra* describes the ways in which a site should be selected for a city and the ways in which the urban form should be planned. The site, frequently rectangular or square, should be divided into grids and each of these allocated to specific gods, occupations and *Varnas* or 'four-fold division of society' (Coningham

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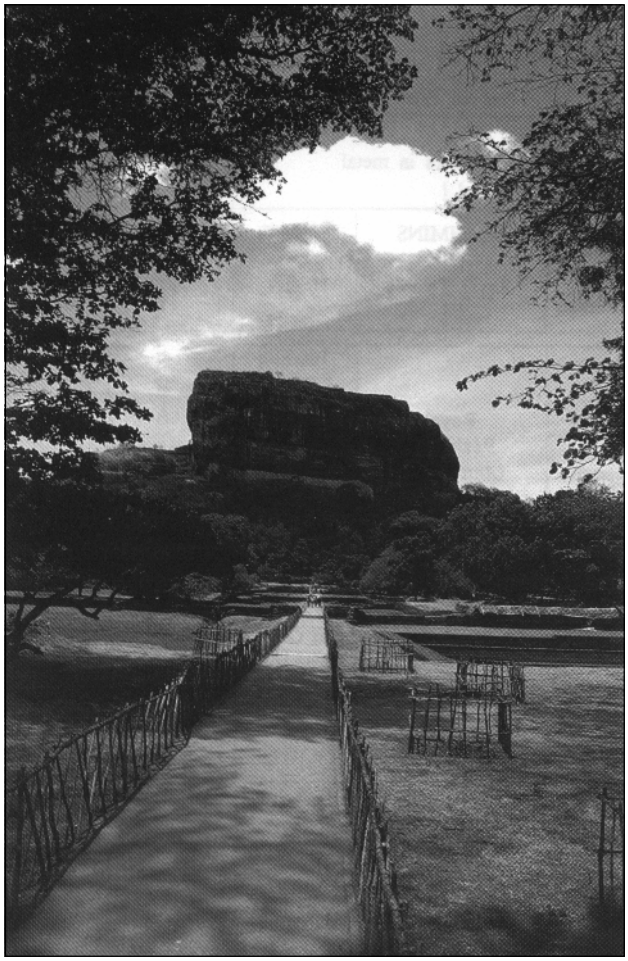


Figure 6. *Sigiriya's ceremonial pathway leading to the city's* axis mundi, *Kasapa I's palace on an image of Mount Meru. (Photograph Coningham.)*

& Young 1999, 85). The latter are socially and spatially separated in the city with *Brahmins* or 'priests' in the north, *Kshatriyas* or 'warriors' in the east, *Vaishyas* or 'merchants and craftsmen' in the south and *Sudras* or 'labourers' in the west (Fig. 5). These groups are frequently, but incorrectly, referred to as castes within Western studies. The foundation of a city is likened to the offering of a sacrifice, which if carried out incorrectly is disastrous for both founder and inhabitants. The city plan represents, therefore, an image of social stability and harmony, guaranteeing those very outcomes. It is widely acknowledged that such imagery is also linked to cosmology (Smith 1994, 155), and that a number of South Asian cities were built as cosmological images utilizing a series of microcosms (Paranavitana 1950). These included the city's moat representing the ocean surrounding the universe; its wall representing the mountain range at the edge of the universe; its palace representing Mount Meru, where the gods dwell at the centre of the universe; and its ruler representing the king of the universe (Wheatley 1971, 437). In both cases the city was built as an image of the ideal world where success and prosperity are guaranteed for both ruler and inhabitants. It should also be noted that such modelling was not restricted to urban sites but pervades contemporary rural settlements (Coningham & Young 1999).

The evidence from a number of medieval sites in South Asia apparently supports the hypothesis that cities were built as cosmological images. The Sri Lankan city of Sigiriya, for example, has been identified as an attempt to recreate the city of Alakamanda, the home of Kubera, god of wealth. Sigiriya was built by a usurper, Kassapa I (reigned AD 473–491), and consisted of three main elements, a walled outer zone, a walled inner zone and a citadel-palace zone at the centre. The innermost zone was constructed on the summit of a 182-m-high rock outcrop, the inner zone enclosed an area of boulders and the outermost zone was defined by a small lake on its southeast side. Paranavitana has claimed that each element was designed to create an image of Kubera's celestial home (1950). Using archaeological, textual and epigraphical sources he identified its lake as the celestial lake Anottatta, its inner zone of white-washed boulders as the snow-clad Himalayas, its central outcrop as Mount Meru and thus its royal palace as that of Kubera (Fig. 6). Creating an image of Alakamanda, the usurper attempted to create his own legitimacy; as Paranavitana stated, it was 'intended to be a miniature Alakamanda and, residing there, Kassapa proclaimed himself to be Kuvera on earth' (1950, 137). A further example is provided by Michell, who has cited evidence from the circular medieval city of Warangal in the eastern Deccan of India (1992). Built between AD 1199–1294, it too consisted of a walled outer zone, a walled inner zone and a citadel-palace zone at the centre (Fig. 7). The innermost zone had four cardinal gates, was centred on a rock outcrop and contained the royal palace and temple. The inner and outermost zones were also circular and provided with gates at the cardinal quarters but Michell has suggested that their openings created a rotational movement based on a *svastika* pattern (1992, 15). He further suggests that the circular plan, cardinal gates and presence of the temple and palace at the centre were intended 'to reproduce in miniature form the basic geometry of the universe' and to 'imbue the royal figure with universal power' (1992, 16–17).

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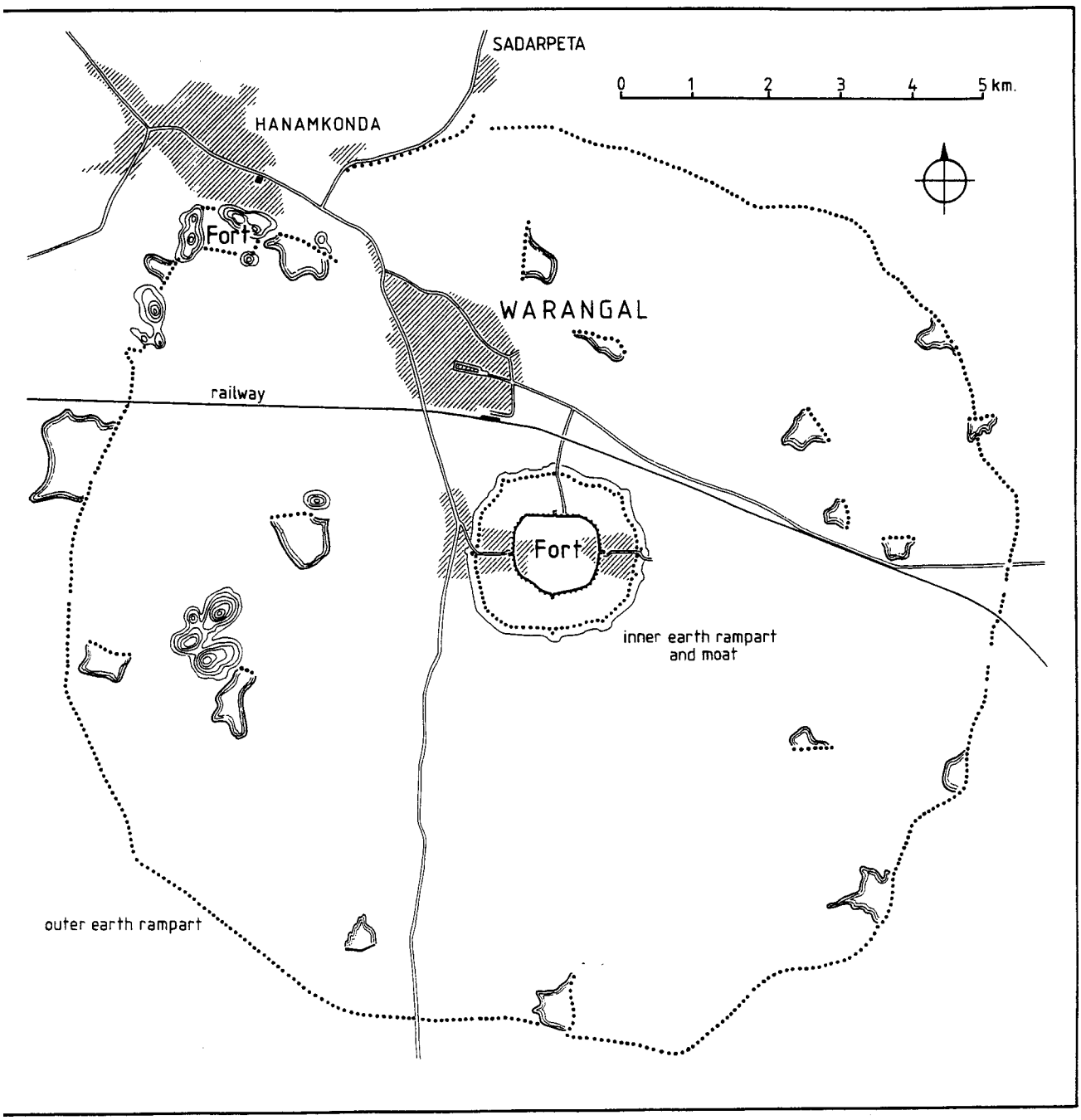


Figure 7. *A plan of the circular city of Warangal. (After Michell 1992.)*

The final example is the seventeenth- and eighteenth-century AD city of Kandy, Sri Lanka's last precolonial capital (Duncan 1990). Kandy comprised three main zones — an outer zone, an inner zone and, at the extreme east, a walled and moated zone containing the royal palace and Temple of the Buddha's Tooth Relic. The city was flanked on the south by a large walled lake known as the *Kiri Muhuhuda* (Coningham & Lewer 1999). Kandy has been identified as an image of the cosmos because the lake's name referred to the ocean which surrounds the cosmos; the lake's wall represented the mountains at the edge of the cosmos; the palace/temple complex wall represented the clouds surrounding Mount Meru; and the eight-cornered tower attached to the temple represented Meru (Duncan 1990; Fig. 8). He

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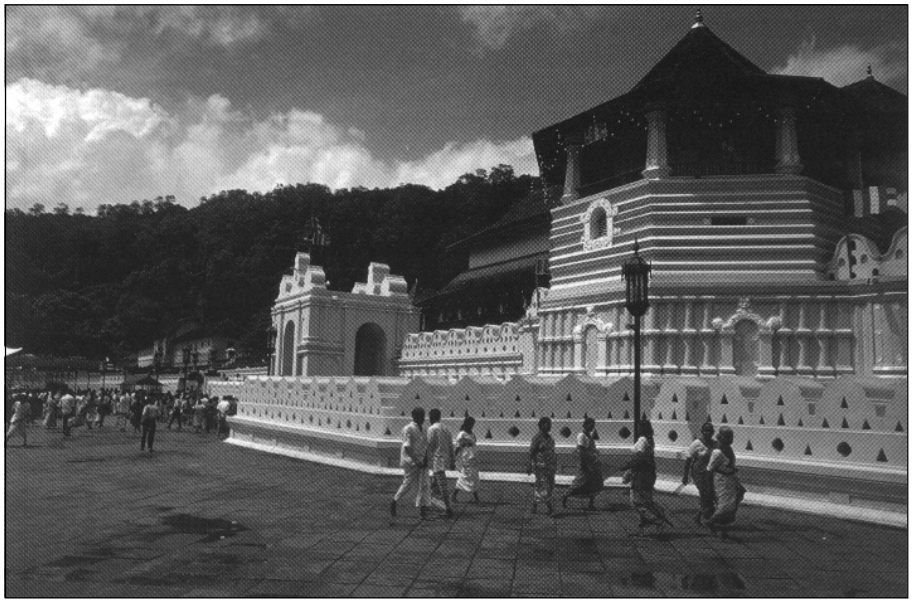


Figure 8. *Kandy's* axis mundi*, the Temple of Buddha's Tooth, framed by walls depicting clouds breaking on the side of Mount Meru. (Photograph Coningham.)*

has suggested its last king, Sri Vikrama Rajasimha (AD 1798–1815) created this plan so that he could 'place his capital, and by extension himself, at the centre of the universe' (1990, 98). Duncan has identified further imagery in which the city also represents an image of the kingdom as the latter had 21 provinces and the former 21 blocks. This claim was further strengthened by the parallelism between the First *Adikar* or Chief Minister's rule over the northern half of the country and the Second *Adikar*'s rule over the south, and the former's control over the north of the city and the latter's over its southern half. Kandy was by no means the last city to be built according to such imagery, as the royal capital of Mandalay was built in 1857 AD utilizing such principles (Wheatley 1971, 440).

Whilst it is quite possible to find evidence in the medieval period, Wheatley's belief in a pervasive tradition of such imagery within South Asia from Chalcolithic times is less convincing. He notes that a number of Harappan urban forms (*c.* 2600–1900 BC) are divided into citadel and lower town and suggests that they may have been ceremonial centres and could have developed from earlier cult centres in Afghanistan and Baluchistan (1971, 326). Furthermore, he attributes religious functions to the citadel mound and secular ones to the lower town. Although Wheatley does not offer a clear cosmo-magical function to the cities' grid plans, Mark Kenoyer has suggested that Harappan cities were 'probably linked to religious beliefs, reflecting the development of precise astronomical observations' (1998, 53). Whilst not disagreeing that astronomical observations may be used to create grid plans, recent evidence from Harappa has begun to undermine the acceptance of a dual model of citadel and lower town. It is now clear that each mound within the vicinity of Harappa is walled, providing evidence of at least four enclosed settlements forming the urban core (Kenoyer 1998, 55). In addition, a number of scholars have suggested that traditional interpretations of the Indus civilization's social organization are incorrect and that obvious displays of wealth and rank were not permitted, and social cohesion was provided through the suppression or masking of individuality (Miller 1985; Rissman 1988). Clearly, the cosmo-magical aggrandisement of rulers and the creation of exemplary centres do not articulate with such models. Moreover, it is interesting to note that in the case of the dual model, the citadel, the zone of postulated sacredness, is not located in the east — the most auspicious direction of later cities.

If such cosmological images did not exist in South Asia's first urbanization, when were they first developed? Wheatley cites examples from South Asia's Early Historic period (*c.* 700 BC–AD 500), including the city of Anuradhapura in Sri Lanka, as ceremonial cities (1971, 256). He is supported in this identification by Duncan who has stated that Anuradhapura's 'city plan manifests religious significance' (1990, 27) and that 'although it did not match the cosmological modelling of a number of Southeast Asian capitals, (it) did incorporate elements of the religious narrative. For example, the city was divided by streets . . . into four sections representing the four quarters of the universe' (Duncan 1990, 52). As this is also the period during which the *Arthasastra* is thought to have been widely used, Anuradhapura provides a good example to test for the presence of a cosmic image. Such a test was undertaken between 1989 and 1993 through the study of the distribution

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of archaeological indicators of craft activities within levels dating to the Early Historic period from 13 trenches within the city (Coningham 1997). Most traditional models for Early Historic cities have assumed that craft activities, such as metal-working or stone-working, would have been located either in the spatial zones prescribed by the *Arthasastra* or in a separate zone of craft activities elsewhere within the city (Auboyer 1965; Rowe 1973). When the distribution of the archaeological craft indicators was spatially plotted within Anuradhapura, it became clear that a very different pattern had been found, with numerous craft activities occurring side by side in almost every locality. Moreover, this diverse pattern of craft activities has been identified within the site from its earliest levels in the Iron Age (*c.* 900 BC) as a small village, through to its abandonment in the eleventh century AD as a royal capital. A further study examined the faunal record from two trenches in different parts of the city on the assumption that different subsistence patterns would have been expected if the city had been planned according to the *Arthasastra* (Coningham & Young 1999). However, both localities were found to demonstrate similar trends of species 'regardless of the fact that these mainly consisted of forbidden species' (1992, 92).

In the light of the failure to identify clear spatial and social planning in the Early Historic period, the period during which the *Arthasastra* was compiled, we may question the application of Wheatley's model to South Asia. Indeed, even the cosmic symbolism of Kandy does not actually bear up to close scrutiny. As noted above, Duncan suggests that the parallelism between the city's 21 blocks and the kingdom's 21 provinces allowed the king to magically control the city and kingdom (1990, 93). If, however, one compares the location within the city of the homes of the provincial governors with the geographical location of their provinces, there is little agreement — suggesting that there was no direct cosmological value to Kandy's street pattern. It is also clear that whilst the cosmological planning of Kandy was evident to the ruler of the city and his Buddhist monks and scribes, others were unaware. For example, Robert Knox, an English sailor marooned on the island for 30 years during Rajasimha's reign, was a resident of Kandy for a number of years and failed to note its cosmic value. Moreover, following his exile from Kandy, the former Chief Minister, Ahalepola, criticized his king's monumental constructions at Kandy by likening him to a despot using forced labour rather than the successful creator of an image of the city of the gods (Duncan 1990, 165).

The presence of 'contestatory' or conflicting interpretations of Kandy's monumental imagery allows us to reflect on the presence of a series of alternative readings of urban forms. Such readings can be divided into 'kingly' or 'artefactual', with the former being read through the media of architectural units, mythology and textual descriptions, and the latter being read through discarded waste. The 'kingly' reading was never fully realized, nor was it ever expected to be, within urban forms in South Asia, and remained on a level of courtly etiquette. Conversely, the 'artefactual' reading stressed the powerful dynamics of socio-economic integration. If this is the case, the presence of such clear spatial and social planning within contemporary rural settlements must still be explained. It is suggested that such patterns are a relatively recent phenomenon and that they represent the enforcement of a largely symbolic division, the *Varna*, with the support of the 'kingly reading' onto a previously flexible organization. The reasons for this enforcement are two-fold; firstly it represented an internalized strategy by indigenous South Asian rulers to counter the severe pressures from the European and Mughal polities, and secondly, it is the result of early colonial officials misinterpreting the 'kingly' or '*Varna*' readings as physical realities. Indeed, a number of scholars have suggested that the flexibility that social groupings enjoyed in the past was only removed during the early years of British rule (Quigley 1993, 83). British Administrators approached the most literate sources of authority, the *Brahmins*, who were also traditional sources of information, and mistook a symbolic religious hierarchy for a political one. As a result, the administrators created a codified hierarchy of status with the *Brahmins* at the top and the outcastes at the bottom. In any case, whilst such modelling may have been possible in small settlements with full social and economic integration, cities always contained too many different variables and dynamics.

That said, a fully integrated 'kingly' and 'artefactual' urban reading was actually realized with the founding of Sir Edwin Lutyens' imperial capital of New Delhi in 1911. New Delhi's social and spatial framework was provided by the Raj's 'Warrant of Precedence' which ranked the basic positions of the city's 3000 officials within the Raj's hierarchy, stretching from the Viceroy at number 1 to the Superintendent of Central Jails at number 61 (King 1976, 242). As New Delhi was an administrative rather than an economic centre, the ranking of businessmen and other independent individuals was not an important factor. Subdivision was also present and

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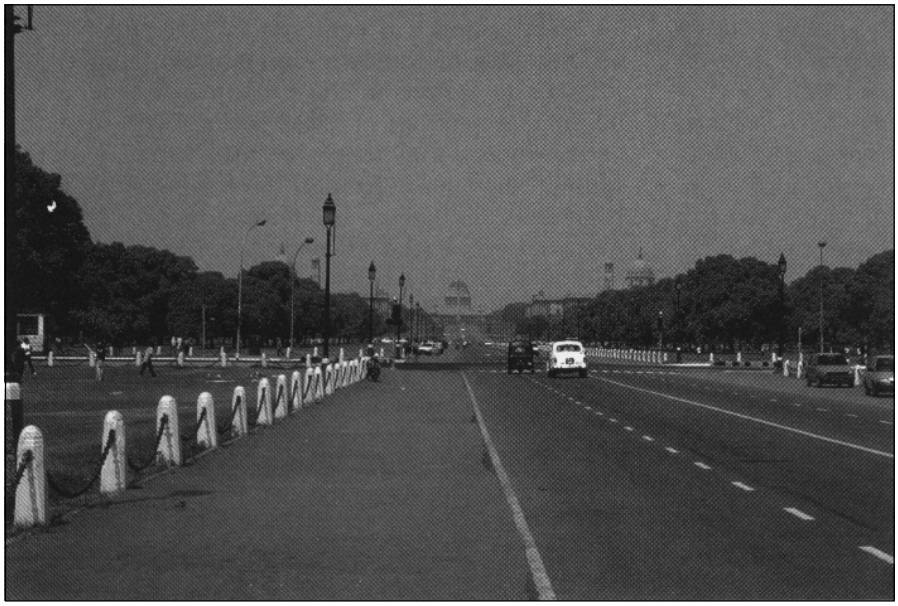


Figure 9. *New Delhi's ceremonial pathway leading to the city's* axis mundi*, the Viceroy's residence. (Photograph Coningham.)*

indigenous rulers, for example, could be further scaled according to their titles and the number of guns fired for them in a salute. New Delhi covered an area of 32 square miles and was spatially divided into five main zones for gazetted officers, European clerks, indigenous clerks, indigenous nobility and an area for those not falling into the other four categories. Rank and position also related to location within individual zones and closeness to the *axis mundi* of power, the Viceroy's residence (Fig. 9). Each zone was subdivided and house and garden size allocated according to rank. Thus the Viceroy's residence occupied two thirds of a square mile, members of his council 6 acres, indigenous rulers between 4 and 8 acres, and gazetted officers between 2 and 3.5 acres (King 1976, 248). Even Higher Education was subject to this modelling, with a residential campus where the Director lived in a Type I lodge, Professors in Type II bungalows, Assistant Professors in Type II flats and Lecturers in Type IV quarters (King 1976, 95). Such imaging even affected where officials greeted visitors: 'If you were greeting a prince of a certain standing you had to go down to the bottom of the steps outside to meet him. With one of less standing, you would probably greet him on the top steps and one of no standing you would probably greet while staying in your study' (Allen 1975, 83).

This image was even temporarily created for the imperial Durbars at Delhi, during which the authority of British rule was legitimated within 'categories and structures existing in the indigenous culture' (King 1976, 223). In 1911 this temporary tented city outside Delhi covered an area of 25 square miles and contained 233 individual camps. The central area was occupied by the Viceroy with the largest tent, the next in size was occupied by the Commander-in-Chief, with smaller tents for Governors, Lieutenant-Governors, Chief Commissioners, Residents, 200 indigenous rulers, 30,000 troops and 100,000 spectators. Such rigid social and spatial imaging has led one scholar to suggest that:

> as members of the incoming culture were obliged not merely to recognise but also to work within what they perceived to be the highly stratified and caste-conscious social categories of the host society, it followed that their own awareness of status, and their notions of stratification, were magnified as a result of the contact between them. The colonial society which emerged from this contact was one whose members accepted the notion of a highly stratified society where each role carried its own status characteristics and conferred its relevant privileges. It followed, therefore, that every member of the society, particularly metropolitan newcomers, had to be socially (*and spatially*) located. (King 1976, 241)

In conclusion, it may be suggested that the use of cosmological imagery in cities in South Asia played an important role within the medieval period, but that such imagery was only one of a number of contesting 'texts' present within the urban form. Even at that period, as we have seen with the case of Anuradhapura, economic dynamics are clearly visible within the 'artefactual' record, forming a 'contestatory' reading. The presence of such alternative readings within individual cities stresses their individuality and complexity, and it was only at the zenith of the British empire that the 'kingly' and 'artefactual' readings were fully integrated with the foundation of the imperial administrative capital of New Delhi.

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The Symbolism of the Angkorian City

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The opening of an international maritime trade route linking Rome and China during the early centuries AD involved not only the exchange of goods, but also the flow of ideas. The indigenous communities of Southeast Asia were key participants, their millennia of experience in seafaring providing a stimulus to wider relationships. In the absence of any documentation on the status of the late prehistoric communities during the early stages of this development, the genesis of states and urban settlements has been subsumed under the term 'Indianization', whereby Indian legal, political and religious forms were either imposed, in a colonialist model, or adopted by emerging local leaders. In its most extreme example, virtually the entire culture of Southeast Asia has been seen as derivative. Thus:

> The people of ancient India established colonies in South-East Asia not by force of arms but by peaceful commercial contacts and religious activities . . . Most of the countries of Asia are indebted to India for their culture and civilization. (Shrivastva 1989, xiii)

The birth of Indianization as a concept to explain the origins of Southeast Asian states is most readily appreciated when one considers that from the upper Irrawaddy to inland Java, and from coastal Vietnam to the Gulf of Siam, urban centres were founded in which temples dedicated to Hindu gods or the Buddha occupied prominent central positions, documented by inscriptions in the sacerdotal Sanskrit or Pali languages. There is, for example, the Cham civilization of coastal Vietnam, the Dvāravatī of Central Thailand and the Angkorian state of Cambodia and Northeast Thailand. This essay will concentrate on the last named, because of its rich epigraphic record.

There has been a sharp revision of models stressing the passivity of the Southeast Asian societies on the eve of the transition to the state, fuelled by Vickery's exhaustive analysis of inscriptions set up from 611 AD in archaic Khmer, and the progress of archaeological research. It is now possible to recognize increasingly rich and socially complex late Iron Age communities whose leaders, in Vickery's words, incorporated an 'Indic veneer' over essentially local cults and practices in which ancestor worship played a prominent role (Vickery 1998). The Iron Age settlements, which covered up to 50 ha and included élite men and women, measured in terms of mortuary wealth, stretch from at least Angkor Borei in the upper Mekong Delta to Noen U-Loke in the Mun Valley of northeast Thailand. They occupy the seminal position in a four-stage sequence which proceeded to a maritime trading state, often known as Funan, in the Mekong Delta (AD 150–550), then to the inland agrarian polities known in the literature as Zhenla (AD 550–810) and thereafter, to the state of Angkor.

Urban centres characterize all three. Oc Eo is the best documented such settlement of the Funan period and exhibited features which recurred for the ensuing millennium: a rectangular enceinte of walls and moats, containing central structures in permanent materials. These were in brick, but by the Angkorian period, stone was increasingly preferred. Isanapura, significantly named after its sovereign Īśānavarman, and Banteay Prei Nokor are the best-known urban centres during the period of Zhenla. Again, we find rectangular walled enclosures and moats containing central brick temples.

There is a palimpsest of centres at Angkor as successive rulers constructed their own temple pyramids. The earliest is arguably at Banteay Choue, now partially covered by the waters of the Western *Baray* (reservoir). Here we find a central temple in early eighth-century style, raised on successive tiers, over a deep subterranean shaft which contained votive deposits. Traces of the enclosing wall and moat are still visible from the air. The second major centre is found to the southeast at Hariharālaya. Again, there were raised brick temples, associated with moats and a major advance in hydraulic engineering, seen in the Indratataka *Baray*. This reservoir, which measures 3 km by 600 m, contained an island temple, and its water was directed south to the temples and, presumably, the palaces and other secular structures of the city.

In the late ninth century, the sovereign Yaśovarman founded a new settlement which centred on the Bakheng. This is a sandstone hill of modest size but great symbolic importance. Its summit is crowned by the Bakheng temple, its base surrounded by a broad moat beyond which lies the outer city of Yaśodharapura. With the occasional lacuna, as when Jayavarman IV moved the capital to Chok Gargyar, Yaśodharapura remained the capital centre of the Angkorian state until the fifteenth century. The best known foundations, each incorporating its central temple, were the Baphuon of Udayādityavarman II, Angkor Wat of Suryavarman II and Angkor Thom of Jayavarman VII. There were, however, many other

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foundations, not least that at Pre Rup built by Rajendravarman, and in the provinces at Banteay Chhmar, Preah Khan of Kompong Svay and Vimapura, modern Phimai.

Our route to understanding the nature of these centres is, for the Western scholar, circuitous. It involves an understanding of Hindu cosmology partially construed through the interpretation of inscriptions in Sanskrit and archaic Khmer. The latter, however, are a strength rarely available in the study of early urban forms, for they provide a contemporary view of the monuments as they were being built or used. The Baphuon is a renowned temple pyramid, mostly constructed during the reign of Udayādityavarman II in the early eleventh century. An inscription from Lovek describes how it was built to represent Mount Meru, the home of the gods. This is a key to understanding not only this temple, but also the Khmer city in general, for the entire complex, from the central shrine to the encircling moats and reservoirs, comprises a unity of expression.

This unity is rooted in the Khmer adoption and transformation of the Hindu conceptualization of the universe as a series of concentric circles radiating out from Mount Meru, the home of the gods. According to the *puranas*, which describe the creation of the Hindu universe, the Mount was surrounded by *jambudvipa*, the island of the rose apple tree, then the salt water ocean and so to outer darkness. There were seven underworlds below, merging with the realms of hell so vividly depicted on the bas reliefs of Angkor Wat (Flood 1996). The gods take many manifestations. Viṣṇu, to whom Angkor Wat was dedicated, was supreme. He rode his eagle *garuḍa*, and in his most significant *avatar* at Angkor, became the tortoise within the ocean of milk supporting Mount Mandara. This mountain was used as the pivot for the churning of the cosmic ocean of milk by the demons and gods to produce the elixir of immortality. This was a favoured theme at Angkor Wat. Śiva was a second major deity who found favour at Angkor. He was the creation god, commonly represented as a phallus, the *liṅga*, named after himself and the ruling sovereign.

Mount Meru was conceived as a series of peaks, with the golden walls of Indra's city Sudarsarna at the summit. This city had a temple at its centre, and was surrounded by four lower peaks. Beyond lay seven mountain ranges and seven oceans. Tambiah (1977) has sought the expression of this cosmic order in the test case of the early Thai state of Sukhothai, wherein the capital represented the cosmos. It is necessary to examine the degree to which we can fully understand the form of the Angkorian city only by reference to the conceptual world of the gods.

Angkor Thom is best considered first, not only because it has survived relatively intact, but also because of the corpus of inscriptions that describe the motives behind its construction. We also have a first-hand description only eight decades after its completion. The city was laid out on the cardinal points of the compass, the outer walls being 3.3 km square. Access through five massive gateways involved crossing the broad outer moat. Four gates led directly to the central temple, known as the Bayon. The other serviced the royal palace, which lay adjacent to the Bayon within its own walls. The bridges crossing the moat are flanked by parallel rows each comprising 54 stone gods who grip a *naga*, a multi-headed snake. The number 54 is highly significant, because the figure 108 is most auspicious. Mannika's (1996) analysis of the dimensions of Angkor Wat, for example, identified the cubit as a vital unit of measurement.

Angkor Thom and the Bayon have been variously interpreted. On the entrance causeway are images of the gods and demons pulling on the snake. Wheatley (1971) projected this further, to incorporate the city as a whole, and the Bayon in particular. He suggested that the *naga* was symbolically twined round the Bayon, the temple mausoleum of Jayavarman VII, which in turn represented the churning stick to produce the elixir of immortality. Again, for one entering the city, the moats would have symbolized the oceans round Mount Meru, the walls the encircling mountain ranges.

Mus (1937) preferred to see in the *naga* balustrade a symbol of the rainbow, the bridge linking the world of humans with that of the gods, while Boisselier (1997) has returned to the contemporary inscriptions in seeking the underlying symbolism of the city, stressing that it was designed to represent the capital of Indra. Just as Indra's capital dominated Mount Meru, so the new Angkor would be built in the centre of the kingdom. The Bayon, lying as it does in the heart of the city, is, in Boisselier's words, the Assembly Hall of the Gods. It was Indra who cast out the *asuras* from heaven and then by fortunate intercession from a *garuḍa* after an ensuing battle, repelled their attempt to return. The god then established a permanent guard against any future attacks. We can see these defences represented in the form of the entrance gates to the city, and the 108 guards located on the bridges which span the moat. Close inspection of the gates reveals not only the faces of the king guarding each cardinal point of the compass, but also Indra himself, riding his three-

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headed elephant and holding a thunderbolt.

Nor is there general acceptance of the symbolism of the great *barays*, or reservoirs. Jayavarman VII was responsible for the Northern *Baray* which, like its larger predecessors, had a temple placed on a central island. The point of contention is whether these reservoirs — the Western *Baray* would have held 123 million cubic metres of water — were constructed for symbolic or economic gain. Groslier (1979) described Angkor as a hydraulic city, dependent for its survival on irrigation. Stott (1992) and Acker (1997) argue that they were not only ill-suited for irrigation, but were not necessary given the options for increased production made possible by the seasonal expansion and retraction of the waters of the Tonle Sap. Here again, inscriptions and archaeological research contribute to the dilemma. Unlike the epigraphic record in Sri Lanka, where reservoir-fed irrigation was often mentioned, there is no such allusion in Cambodia. Rather, the Khmer inscriptions stress the holy nature of the water. A text in each corner of the Eastern *Baray* under Yaśovarman placed it under the protection of goddess Ganga, representing the Ganges. Many other texts compare the Kulen uplands, whence the rivers flowing to Angkor originated, with the Himalayas, and their water as sacred. Under this interpretation, the *barays* represent the oceans surrounding the home of the gods.

Angkor Thom, while reproducing heaven in stone through its profound religious symbolism, also had a vigorous secular life. In 1297, Zhou Daguan visited the capital as part of a Chinese delegation. He did not mention irrigation once in his eye-witness account of the country, but did describe a large and active urban population, distinguishing for example between the spendour of the royal palace, the superior housing enjoyed by the élite, and the ordinary dwellings of the populace at large. From the Bayon bas reliefs, we can see aspects of urban life, the market, the house of a Chinese merchant, and construction activity.

Yaśovarman founded the city which bore his name in the late ninth century AD. The Bakheng temple rose above the city on a dominating hill, the base of which was ringed by a wide moat. This temple has been the subject of detailed analysis, particularly by Filliozat (1954), and again its cosmic symbolism has been identified. It comprises five terraces, each bearing a row of shrines, on top of which stand the central and four subsidiary towers built to represent Mount Meru. Again we find the vital number 108, being the number of shrines which accompany the central tower. By dividing 108 by four, one obtains the four phases of the moon. Wheatley (1971) proceeds by describing the Bakheng as 'a plastic representation of Mount Meru, the axis of the universe, the kingdom, and the capital'.

Angkor Wat, the largest and most symbolic of the temples at Angkor, is difficult to place within this essay because it was not clearly part of a distinct city plan. Jacques (1999) has suggested that the area between the inner temple and the moat contained the residences and that the complex as a whole should be seen as urban, but this needs to be tested by excavation. Whatever the case, the present temple again centres upon the raised tiers leading to the central tower with its four companions, and has its necessary surrounding wall and wide moat crossed by a *naga*-flanked bridge. This temple was dedicated to Viṣṇu, and still houses a huge statue to this god. In a recent survey, Mannika (1996) has suggested that a full understanding of this remarkable complex turns on the actual dimensions of its component parts, but again there is no uniformity of opinion on this point.

There can, however, be no doubt that the Angkorian cities were designed to recreate the world of the gods. The ultimate purpose of this quest for perfection may be found in the divine nature of kingship. The great *liṅgas* which occupied the centre of the Saivite temples bore the name of the god combined with that of the king. The central shrines likewise incorporated images of the deified royal ancestors. The subtle self of the King Suryavarman combined with Viṣṇu in the temple mausoleum of Angkor Wat, just as Jayavarman VII may be seen represented in the colossal heads of the Buddha which dominate the Bayon. As Tambiah emphasized in his consideration of the galactic polity, the sovereign was the centre and pivot of the state, who interceded between the mortal world and that of the gods, the upholder and exemplar of moral law. In this context, it was only fitting that his capital should be built in the reflection of the home of the gods with whom he communed in life and joined in death.

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Intentionality and Meaning in the Layout of Teotihuacan, Mexico

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Teotihuacan was a great city that flourished in the highlands of central Mexico between about 100 BCE and 650 CE (Cowgill 1997; 2000; Pasztory 1997). For several centuries it covered about 20 km^2 and had a population on the order of 100,000 or so. It had a highly structured layout, especially in the *c.* 2.5 km by 1 km central civic-ceremonial district, that was surely planned and meaningful. Teotihuacan has suffered, however, from its share of dubious or fanciful interpretations. Most of these studies concentrate on the formal patterns and are exceedingly naïve or neglectful of plausible sociocultural contexts. Nevertheless, a considerable degree of intentional patterning is undeniable.

Central Teotihuacan as a cosmogram

The most monumental and visually impressive features of Teotihuacan are the Sun Pyramid, the Moon Pyramid, and the Ciudadela (Fig. 10). The Moon Pyramid is, like most Mesoamerican pyramids, composed of several superposed stages. It faces south, at the northern terminus of the broad (*c.* 60 m) north–south 'Avenue of the Dead'. About two kilometres to the south along this avenue, on its east side, is the Ciudadela, a nearly square quadrangle enclosed by platforms about 400 m long, which are about 80 m wide and 8 m high on the north, east, and south, while that on the west is lower and narrower. Fifteen stepped pyramids top the platforms, and within the enclosure is the west-facing Feathered Serpent Pyramid (or Temple of Quetzalcoatl), plus a stepped platform added to the west face of the pyramid, a large open plaza, several room complexes, and a few other features. Balancing the Ciudadela on the west side of the Avenue of the Dead is the 'Great Compound', far less readily visible because it is composed of relatively low broad platforms, but covering a larger area than the Ciudadela and enclosing an open central plaza about 216 m north–south and somewhat longer east–west.

The Avenue of the Dead (notwithstanding doubts expressed by Sugiyama 1993) clearly extends another 3 km or more to the south, although there is very little monumental architecture along this southern extension. Between the Moon Pyramid and the Ciudadela, however, the avenue is lined with numerous civic-ceremonial platforms and pyramids, as well as what appear to be high-status residences. By far the most prominent is the stepped and west-facing Sun Pyramid, which in its present condition is about 223 m on a side at the base and about 63 m high — a footprint close to that of the largest pyramid at Giza, with about half the height. The Moon Pyramid has about a quarter of the Sun's volume. The Feathered Serpent Pyramid, third largest in the city, is about 66 m on a side at the base and roughly 20 m high.

The Sun and Moon Pyramids and the Avenue (or street) of the Dead are thus named because this is what the Aztecs called them in the sixteenth century. The Teotihuacán state had collapsed some 900 years earlier, however, and it is not clear whether the Aztec designations reflected the meanings of these features for the Teotihuacanos. The 'Ciudadela' is a Spanish designation based on its supposed resemblance to a fortress. The 'Great Compound' was first recognized and named by René Millon's Teotihuacan Mapping Project in the 1960s (Millon 1973). This project provided the detailed map, based on aerial photogrammetry, and accurate to within a metre or two, that has made possible much of the subsequent analysis of Teotihuacan's layout (Millon *et al.* 1973).

The most comprehensive, astute, and (largely) convincing study of the materialization of cosmology at Teotihuacan is that by Sugiyama (1993). Among many other things, he argues, using multiple lines of evidence, that the Sun and Moon Pyramids really were associated with those deities (or concepts), while the Ciudadela and the Feathered Serpent Pyramid were associated with Venus. The Avenue of the Dead appears to be a horizontal axis representing the widespread Mesoamerican model of a layered universe, with north at the top and south at the bottom. A good case for a similar north–south representation of the vertical cosmic axis among the lowland Classic Maya, some 1000 km to the east, has been made by Coggins (1980) and Ashmore (1991).

Further possible support for identifying the Moon Pyramid with the moon is the fact that remains of two huge monolithic sculptures of a figure in female dress have been found not far from the Moon Pyramid. The figure has been labelled a water goddess, but this identification is not compelling, and it may be the Moon Goddess.

The Río San Juan is a small stream that crosses

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the ancient city in a general northeast to southwest direction. It has been clear since the Mapping Project of the 1960s that for several thousand metres the natural course of this stream was altered to conform to the grid plan of the city. It runs east–west across the Avenue of the Dead a short distance north of the Ciudadela. Sugiyama (1993) argues that this stream marked the division between the multilayered heavens to the north and the watery Underworld to the south. The Ciudadela and the Feathered Serpent Pyramid have a number of iconographic watery associations, as do Venus and the feathered serpent, which are associated with one another. Six transverse platforms crossing the Avenue of the Dead between the Río San Juan and the Sun Pyramid may mark some of the multiple layers of the heavens.

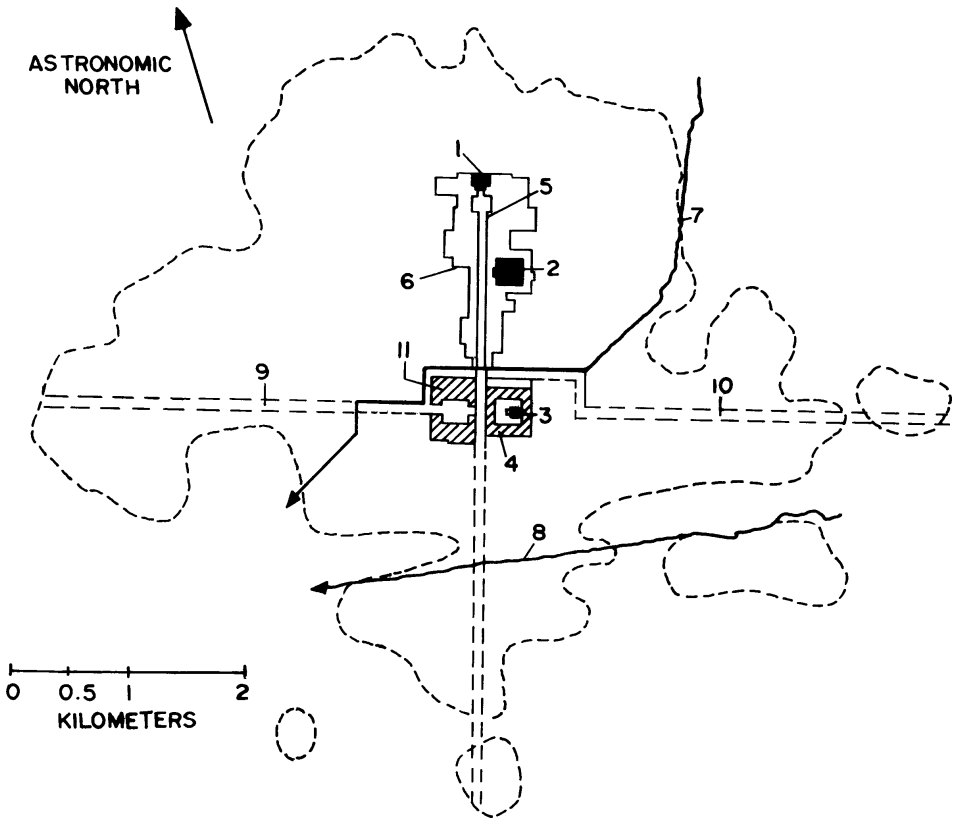


Figure 10. *Greatly simplified map of Teotihuacan showing the principal features discussed and, very approximately, the limits of the zone of urban occupation at about 500 CE. Features indicated are (1) the Moon Pyramid, (2) the Sun Pyramid, (3) the Feathered Serpent Pyramid, (4) the outer platforms of the Ciudadela, (5) the Avenue of the Dead, (6) approximate limits of the central civic-ceremonial district directly related to the northern Avenue of the Dead, (7) the Río San Juan, (8) the Río San Lorenzo, (9) West Avenue, (10) East Avenue, (11) the Great Compound. (Adapted from Millon 1973.)*

This interpretation is not established beyond doubt, and there are certain difficulties, such as placing the moon in the highest heavenly layer, yet it makes a great deal of sense and is consonant with a wide variety of data, both from Teotihuacan and from other times and places in Mesoamerica. It thus seems highly likely that the northern 2200 m or so of the Avenue of the Dead was intentionally laid out as a cosmogram; more specifically, a vertical *axis mundi*.

Given the monumental salience of this north–south axis (representing up-down), one looks for a comparable east–west axis. Sugiyama (1993) is unduly skeptical of important east–west streets, 'East Avenue' and 'West Avenue', multiple evidences of which were found by the Mapping Project over stretches of several kilometres. Nevertheless, monumental structures are virtually absent along these avenues, although there is a low transverse platform in East Avenue about 2750 m east of the Avenue of the Dead (site 11:N1E6 of the Teotihuacan map) and probable platforms in West Avenue about 2250 m and 2750 m west of the Avenue of the Dead. Moreover, although West Avenue leads directly into the Great Compound, East Avenue appears to turn to the north about 500 m east of the Ciudadela and does not lead into it. The east–west axis, then, is not marked by alignments of salient features, but by the fact that the Sun and Feathered Serpent Pyramids both face west. At the Sun Pyramid, especially, it is likely that this relates to the daily movement of the sun from east to west. Perhaps short-term movements were represented materially by the directions in which these major pyramid-temples faced, while the north-south (up-down) axis represents the stable structure of the cosmos.

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Meaningful measurements

Evidence for a fairly uniform Teotihuacan measurement unit (TMU) of slightly more than 80 cm has been mounting for some time. Drewitt (1967; 1987) and Drucker (1974) proposed a TMU of 80.5 cm. Sugiyama (1993) finds that 83 cm works better in many cases, while in other cases a TMU around 82.3 cm is better. The unit may have varied somewhat over time, and measurements without great ritual significance or over great distances were perhaps not highly accurate. Yet there is no reasonable doubt that a TMU of around 83 cm or a little less was in wide use. In the case of ordinary residences it may have had little significance except as a practical convenience for masons in laying out structures and calculating amounts of materials needed. The case is far different with major civic-ceremonial structures and the spatial relations among them. Sugiyama (1993) notes that from the rear side of the Moon Pyramid to the present south edge of the Río San Juan is very close to 2000 TMU, while a projection of the east–west centreline of the Sun Pyramid divides this quite evenly into two intervals of 1000 TMU each. Further to the south, the Río San Lorenzo, its course also altered in ancient times, crosses the axis of the Avenue of the Dead about 4000 TMU south of the Moon Pyramid. There are some uncertainties about the most appropriate measurement points. Both rivers run through ravines 15 to 40 m wide that have probably shifted somewhat since Teotihuacan times, and, since the rear of the Moon Pyramid represents its latest construction stage, a better reference point might be somewhat to the south. Nevertheless, the clarity and simplicity of this pattern, and the fact that it comes out in simple multiples of a TMU previously established on the basis of multiple measurements made by several researchers on quite different features, all argue that it is very unlikely to be one of those seemingly-more-than-coincidence patterns that can always be found when enough measurements are made of enough features.

The existence of this 1:1:2 ratio in the distances between the Moon Pyramid and the Sun Pyramid, the Sun Pyramid and the Río San Juan, and the Río San Juan and the Río San Lorenzo seems clear enough, but its cosmological significance is unclear. It is possible that this particular facet of the layout of Teotihuacan merely reflects mundane orderliness rather than any deeper meaning. Even if so, however, it shows how features far outside the central civic-ceremonial district of the city were laid out in conformance with a single unified system, and this in turn implies a highly centralized city-wide authority.

Sugiyama (1993) goes further and notes that many monumental structures were laid out in multiples of the TMU that have meanings in relation to the various calendrical cycles widely used in Mesoamerica, of 260, 365, 584, and 819 days, and of 52 years and 73 of the 260-day cycles ($52 \times 365 = 73 \times 260$, so after 52 'vague' years of 365 days the 260-day cycle and the 365-day cycle return to the same synchronization). Among his examples are that the original sides of the Sun Pyramid were 216 m (260 TMU) long, the east edge of the platform around the Sun Pyramid and the east edge of the Ciudadela are both 520 (2×260) TMU east of the central axis of the Avenue of the Dead, a major segment of the channelized Río San Juan is about 2×819 TMU long, many apartment compounds outside the civic-ceremonial district are about 73 TMU (60–61 m) on a side, and from the east edge of the Great Compound to the east edge of the Ciudadela is 584 TMU (of particular significance because one astronomical Venus cycle is about 584 days and because of the numerous other Venus associations at the Ciudadela). At some point the reader may feel that some of these coincidences are fortuitous, given the very large number of possible relationships that might be considered. Nevertheless, it is difficult to dismiss them all as merely accidental.

Spatial orientations

Up to now I have spoken simply of 'east', 'west', and other directions. In fact, many Mesoamerican sites of the Classic Period were oriented roughly 17 degrees east of true (astronomic) north. At Teotihuacan, a specific variant of this, 15.5 degrees east of north, was followed unusually closely in the Avenue of the Dead and many other north–south features. This orientation was followed very closely even several kilometres outside the civic-ceremonial district, and some distance outside the city itself. Still today, some roads in the Teotihuacan Valley follow this orientation. Some east–west features are at right angles to this (i.e. 15.5 degrees south of east), but many are at about 91 degrees or a bit more (i.e. 16.5 to 17 degrees south of east). Notable examples are the Ciudadela and the large walled compound attached to its north side (site 2:N1E1), where segments of original wall facings of concrete over rubble cores can be observed over distances up to 400 m. These structures are not rectangles but (to within 10 minutes or so) parallelograms, the north–south running sides at 15.5 degrees east of north and the east–west running sides

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16.5–17 degrees south of east. It is unlikely that Teotihuacano builders were unaware of this, but the reason for this deviation from a right angle is unclear.

As to the 15.5 degree orientation, various efforts have been made to explain it in astronomical terms. Perhaps most convincing is the suggestion that the sun would set 15.5 degrees north of west on 12 or 13 August, which is the day on which the Maya 'Long Count' began in *c.* 3000 BCE, the start of the present cosmic cycle of creation, essentially 'the day time began' (Millon 1981, 239–40). Thus, on that day (as well as on 29 or 30 April) the Sun Pyramid would face directly toward the setting sun.

One important anomaly in Teotihuacan orientations is the Río San Lorenzo, toward the southern outskirts of the city. Its channelized course is about 8 degrees south of east, that is, just half the deviation from astronomic north of the canonical Teotihuacan orientation. The reason for this anomaly is unclear, but it may provide a key in explaining the predominant Teotihuacan orientation.

Many Mesoamerican cities show integrated planning within districts, but different plans for different districts. At Teotihuacan, the same orientations and multiples of the same measurement unit prevail throughout the entire urban zone, and even beyond, without apparent disjunctions. This implies that a strong overarching central authority could override local interests. In this brief paper I have not dealt with the Teotihuacan chronological sequence, but the features I have described were built over the course of several centuries. Sugiyama (1993) argues that they all represent the unfolding of a comprehensive original master plan. I think it possible, however, that some were innovations not foreseen from the beginning. Even if so, the later structures were sited with close regard for what already existed, so that the result is coherent rather than an architectural hodge-podge.

Some further considerations

Visitors to Teotihuacan are impressed by the way that Cerro Gordo, a broad extinct volcano, frames the Moon Pyramid as seen from the Avenue of the Dead. Not only is this visually striking; Cerro Gordo in recent traditions is considered a sacred water-filled mountain, and it is very likely the personified sacred mountain seen in a wall painting in the Tepantitla apartment compound at Teotihuacan. Tobriner (1972) and others argue that the relationship of the Avenue of the Dead to Cerro Gordo is not accidental. Given a commitment to the 15.5 degree orientation, this relationship could have been achieved by putting the Avenue of the Dead in a specific east–west position. This leaves one other major symbolic feature to be accounted for — the cave underneath the Sun Pyramid. Heyden (1975; 1981) and Millon (1981) argue that this was a sacred cave associated with the emergence of humans and perhaps also the underworld and the night sun. This would have added to the sacred significance of the Sun Pyramid. It is not likely that Teotihuacanos would have felt any logical discomfort in associating the Ciudadela with the watery underworld and Venus, and at the same time the cave underneath the sun Pyramid with the underworld of the night sun. Although the cave is probably natural in origin it was heavily modified by the Teotihuacanos and its present entrance may not be the original one. Since it runs generally east–west this means that the Sun Pyramid could be situated just east of its present entrance and still conform to an Avenue of the Dead situated so that, running 15.5 degrees east of north, the Avenue would point toward Cerro Gordo. In this way the Teotihuacanos could have achieved a harmonious integration of symbolically significant features of the natural landscape with built features of cosmological and calendric significance, something along the lines suggested by Carlson (1981).

References

Acker, R.L., 1997. New Geographic Tests of the Hydraulic Thesis at Angkor. Unpublished M.A. Dissertation, School of Oriental and African Studies, London.

Al Sayyad, N., 1991. *Cities and Caliphs: On the Genesis of Arab Muslim Urbanism*. London: Greenwood Press.

Albenda, P., 1986. *The Palace of Sargon, King of Persia*. Paris: Editions Recherche sur les Civilisations Synthese.

Allen, C., 1975. *Plain Tales from the Raj: Images of British India in the Twentieth Century*. London: British Broadcasting Company.

Ancillotti, A. & R. Cerri, 1997. *The Tables of Iguvium.* Perugia: Jama.

Anon., 1922. *Historia Augusta: the Scriptores Historiae Augustae.* Loeb trans., D. Magie. London: Heineman.

Aristotle, 1968a. *Metaphysics*. Loeb trans., H. Tredennick. London: Heineman.

Aristotle, 1968b. *Nichomachean Ethics*. Loeb trans., H. Rackham. Cambridge (MA): Harvard University Press.

Ashmore, W., 1991. Site-planning principles and concepts of directionality among the ancient Maya. *Latin American Antiquity* 2, 199–226.

Auboyer, J., 1965. *Daily Life in Ancient India*. London: Weidenfeld & Nicolson.

Barton, T., 1994. *Power and Knowledge. Astrology, Physio-*

https://doi.org/10.1017/S0959774300000135 Published online by Cambridge University Press

gnomics and Medicine under the Empire. Ann Arbor (MI): University of Michigan Press.
Boisselier, J., 1997. The meaning of Angkor Thom, in *Sculpture of Angkor and Ancient Cambodia. Millennium of Glory*, eds. H.I. Jessup & T. Zéphir. Washington (DC): National Gallery of Art, 117–20.
Botta, P. & F. Flandrin, 1849–50. *Monument de Ninive* [sic.], 5 vols. Paris: Imprimerie Nationale.
Braund, D., 1996. *Ruling Roman Britain*. London: Routledge.
Budge, E.A., 1914. *Assyrian Sculptures in the British Museum, Reign of Ashur-nasir-pal, 885–860* BC. London: Oxford University Press.
Calvino, I., 1979. *Invisible Cities.* London: Pan.
Caminos, R.A., 1954. *Late-Egyptian Miscellanies*. London: Oxford University Press.
Campbell, B., 1996. Shaping the rural environment: surveyors in ancient Rome. *Journal of Roman Studies* 86, 74–99.
Carlson, J.B., 1981. A geomantic model for the interpretation of Mesoamerican sites: an essay in cross-cultural comparison, in *Mesoamerican Sites and World-Views*, ed. E. Benson. Washington (DC): Dumbarton Oaks, 143–215.
Cassian, J., 1997. *Conlationes patrum XXIV: the Conferences*, trans. & annot. B. Ramsey. New York (NY) & Matiwah (NJ): Paulist Press.
Childe, V.G., 1950 (reprinted 1979). *The Urban Revolution, in Ancient Cities of the Indus*, ed. G.L. Possehl. New Delhi: Vikas, 12–17.
Coggins, C., 1980. The shape of time: some political implications of a four-part figure. *American Antiquity* 45, 727–39.
Coningham, R.A.E., 1997. The spatial distribution of craft activities in Early Historic cities and their social implications, in *South Asian Archaeology* 1995, eds. F.R. Allchin & B. Allchin. New Delhi: Oxford and IBH, 35–48.
Coningham, R.A.E. & N. Lewer, 1999. Paradise Lost: the bombing of the Temple of the Tooth — a UNESCO World Heritage site in Sri Lanka. *Antiquity* 73, 857–866.
Coningham, R.A.E. & R.L. Young, 1999. The archaeological visibility of caste: an introduction, in *Case Studies in Archaeology and World Religion*, ed. T.A. Insoll. Oxford: BAR, 84–93.
Le Corbusier, 1929 [1971]. *The City of Tomorrow and its Planning*, translated from the 8th French edition of *Urbanisme* by F. Etchells. [The 1971 edition: London: The Architectural Press.]
Cowgill, G.L., 1997. State and society in Teotihuacan, Mexico. *Annual Review of Anthropology* 26, 129–61.
Cowgill, G.L., 2000. The central Mexican highlands from the rise of Teotihuacan to the decline of Tula, in *The Cambridge History of the Native Peoples of the Americas*, vol. II: *Mesoamerica*, part 1, eds. R.E.W. Adams & M.J. MacLeod. Cambridge: Cambridge University Press, 250–317.
Crawford, M., 1996. *Roman Statutes*, vol. 1. London: Institute of Classical Studies.
Czerny, E., 1999. *Tell el-Dab'a IX. Eine Plansiedlung des frühen Mittleren Reiches*. (Untersuchungen der Zweigstelle Kairo des Österreichischen Archäologischen Institutes 15.) Vienna: Verlag der Österreichischen Akademie der Wissenschaften.
Davies, N. de G., 1943. *The Tomb of Rekh-mi-Re at Thebes.* New York (NY): Metropolitan Museum of Art.
Davis, W., 1992. *Masking the Blow: the Scene of Representation in Late Prehistoric Egyptian Art*. Oxford & Berkeley (CA): University of California Press.
Donald MacTaggart, W., 1965. The reality of urbanism. *Pacific Viewpoint* 6, 220–24.
Drewitt, R.B., 1967. Planeación en la antigua ciudad de Teotihuacan, in *Teotihuacán, Onceava Mesa Redonda.* México (DF): Sociedad Mexicana de Antropología, 79–94.
Drewitt, R.B., 1987. Measurement units and building axes at Teotihuacan, in *Teotihuacan: Nuevos datos, nuevas síntesis, nuevos problemas*, eds. E. McClung de Tapia & E.C. Rattray. México (DF): Universidad Nacional Autónoma de México, 389–98.
Drucker, R.D., 1974. *Renovating a Reconstruction: the Ciudadela at Teotihuacan, Mexico: Construction Sequence, Layout, and Possible Uses of the Structure*. Ph.D. dissertation, University of Rochester. Ann Arbor (MI): University Microfilms.
Duncan, J.S., 1990. *The City as Text: the Politics of Landscape Interpretation in the Kandyan Kingdom*. Cambridge: Cambridge University Press.
Dutt, B.B., 1925. *Town Planning in Ancient India*. Calcutta: Thacker, Spink & Co.
Eliade, M., 1958. *Patterns in Comparative Religion*. London: Sheed and Ward.
Eliade, M., 1959. *The Sacred and the Profane*. New York (NY): Harcourt, Brace.
Erickson, B. & T. Lloyd-Jones 1997. Experiments with settlement aggregation models. *Environment and Planning B: Planning and Design* 24, 903–28.
Filliozat, J., 1954. Le symbolisme du monument du Phnom Bakheng. *Bulletin de l'Ecole Française d'Extrême Orient* 44, 527–54.
Flood, G., 1996. *An Introduction to Hinduism.* Cambridge: Cambridge University Press.
Frankfort, H., 1933. *The Cenotaph of Seti I at Abydos*, vol. I. (39th Memoir.) London: Egypt Exploration Society.
Frankfort, H., 1970. *The Art and Architecture of the Ancient Near East*. Harmondsworth: Penguin.
Gadamer, H-G., 1975. *Truth and Method*. London: Sheed and Ward.
Gadamer, H-G., 1980. *Dialogue and Dialectic*. New Haven (CT): Yale University Press.
Gadamer, H-G., 1985. On the origins of philosophical hermeneutics, in *Philosophical Apprenticeships*, trans. R.R. Sullivan. Cambridge (MA): MIT Press, 176–93.
Giddy, L. & D. Jeffreys, 1993. The people of Memphis. *Egyptian Archaeology* 3, 18–20.
Groslier, B-P., 1979. La cité hydraulique Angkorienne. *Bulletin de l'Ecole Française d'Extrême Orient* 66, 161–202.
Gunawardana, R.A.L.H., 1981. Social function and politi-

https://doi.org/10.1017/S0959774300000135 Published online by Cambridge University Press

cal power: a case study of state formation in irrigation society, in *The Study of the State*, eds. H.J.M. Claessen & P. Skalník. The Hague: Mouton, 133–54.
Haverfield, F., 1911. Town planning in the Roman world, in *Transactions of the Royal Institute of British Architects Town Planning Conference.* London: RIBA, 123–31.
Haverfield, F., 1913. *Ancient Town Planning*. Oxford: Blackwells.
Hedley, O., 1972. *Royal Palaces: an Account of the Homes of British Sovereigns from Saxon to Modern Times*. London: Robert Hale.
Heidegger, M., 1975. *The Question of Being*. London: Vision Press Ltd.
Heidegger, M., 1977. The age of the world-picture, in *The Question Concerning Technology and Other Essays*, trans. W. Lovitt. New York (NY): Harper and Row, 115–54.
Heyden, D., 1975. An interpretation of the cave underneath the Pyramid of the Sun in Teotihuacán, Mexico. *American Antiquity* 40, 131–47.
Heyden, D., 1981. Caves, gods, and myths: world-view and planning in Teotihuacán, in *Mesoamerican Sites and World-Views*, ed. E. Benson. Washington (DC): Dumbarton Oaks, 1–39.
Hietala, H.J. (ed.), 1984. *Intrasite Spatial Analysis in Archaeology*. Cambridge: Cambridge University Press.
Hillier, B. & J. Hanson, 1984. *The Social Logic of Space.* Cambridge: Cambridge University Press.
Hocart, A.M., 1928, Town planning. *Ceylon Journal of Science* (Section G) 1.4, 150–56.
Hocart, A.M., 1930, Town planning. *Ceylon Journal of Science* (Section G) 2.2, 86–7.
Hodder, I., 1986. *Reading the Past.* Cambridge: Cambridge University Press.
Hölscher, U., 1934. *General Plans and Views*: *the Excavation of Medinet Habu, I.* (Oriental Institute Publications 21.) Chicago (IL): Oriental Institute.
Humm, M., 1986. Appius Claudius Caecus et la construction de la via Appia. *Mélanges de l'École Française de Rome* 108, 693–746.
Husserl, E., 1936. The origins of geometry, now appendix VI to *The Crisis of European Sciences and Transcendental Phenomenology*, trans. D. Carr. Evanston (IL): Northwestern University Press, 353–78.
Jacobsen, T., 1972. Mesopotamia: the function of the state, in *Before Philosophy: the Intellectual Adventure of Ancient Man*, by H. Frankfort, J.A. Wilson & T. Jacobson. Harmondsworth: Penguin, 205.
Jacques, C., 1999. *Angkor*. Cologne: Könemann.
Jeffreys, D.G., 1985. *The Survey of Memphis* I. (Occasional Publications 3.) London: Egypt Exploration Society.
Kemp, B.J., 1989. *Ancient Egypt: Anatomy of a Civilization.* London: Routledge.
Kemp. B.J. & S. Garfi, 1993. *A Survey of the Ancient City of El-'Amarna*. (Occasional Publications 9.) London: Egypt Exploration Society.
Kenoyer, J.M., 1998. *Ancient Cities of the Indus Valley Civilisation.* Karachi: Oxford University Press.
King, A., 1976. *Colonial Urban Development: Culture, Social Power and Environment.* London: Routledge & Kegan Paul.
Klein, J., 1968. *Greek Mathematical Thought and the Origin of Algebra*, trans. E. Braun. New York (NY): Dover Publications.
Kubler, G., 1982. *Building the Escorial*. Princeton (NJ): Princeton University Press.
Lachterman, D., 1989. *The Ethics of Geometry: a Genealogy of Modernity*. New York (NY): Routledge.
Lacovara, P., 1981. The Hearst excavations at Deir el-Ballas: the Eighteenth Dynasty town, in *Studies in Ancient Egypt, the Aegean, and the Sudan: Essays in Honor of Dows Dunham on the Occasion of his 90th birthday, June 1, 1980*, eds. W.K. Simpson & W.M. Davis. Boston (MA): Museum of Fine Arts, 120–4.
Lacovara, P., 1997. *The New Kingdom Royal City*. London & New York (NY): Kegan Paul International.
Laurence, R., 1994a. Modern ideology and the creation of ancient town planning. *European Review of History* 1, 9–18.
Laurence, R., 1994b. Emperors, nature and the city: Rome's ritual landscape. *Accordia Research Papers* 4, 79–87.
Laurence, R., 1996. Ritual, landscape and the destruction of place in the Roman imagination, in *Approaches to the Study of Ritual: Italy and the Mediterranean*, ed. J. Wilkins. London: Accodia, 111–21.
Leach, E.R., 1973. Concluding address, in *The Explanation of Culture Change: Models in Prehistory*, ed. A.C. Renfrew. London: Duckworth, 761–771.
Ledoux, C-N., 1804. *L'Architecture considérée sous le Rapport de L'Art, des Moeurs et de la Legislation*. Paris: chez l'Auteur. [Reprint: Nördlingen, 1981, Verzog Dr Alfous Uti.]
Lehner, M., 2000. Fractal house of Pharaoh: ancient Egypt as a Complex Adaptive System, a trial formulation, in *Dynamics in Human and Primate Societies: Agent-based Modeling of Social and Spatial Processes*, eds. T.A. Kohler & G.J. Gumerman. (Santa Fe Institute Studies in the Sciences of Complexity.) New York (NY) & Oxford: Oxford University Press, 275–353.
Lichtheim, M., 1980. The praise of cities in the literature of the Egyptian New Kingdom, in *Panhellenica: Essays in Ancient History and Historiography in Honor of Truesdell S. Brown*, eds. S.M. Burstein & L.A. Okin. Lawrence (KA): Coronado Press, 15–23.
Lloyd, S., 1974. *The Art of the Ancient Near East*. London: Thames and Hudson.
McDowell, A.G., 1999. *Village Life in Ancient Egypt: Laundry Lists and Love Songs*. Oxford: Oxford University Press.
Mallinson, M., 1995. Excavation and survey in the Central City, 1988–92, in *Amarna Reports* VI, ed. B.J. Kemp. London: Egypt Exploration Society, 169–215.
Mallinson, M., 1999. The sacred landscape, in *Pharaohs of the Sun: Akhenaten, Nefertiti, Tutankhamen*, eds. R.E. Freed, Y.J. Markowitz & S.H. D'Auria. Boston (MA): Museum of Fine Arts, 72–9.
Mannika, E., 1996. *Angkor Wat. Time, Space, Kingship.* Honolulu (HI): University of Hawai'i Press.

https://doi.org/10.1017/S0959774300000135 Published online by Cambridge University Press

March, L. & P. Steadman, 1971. *The Geometry of Environment: an Introduction to Spatial Organization in Design*. London: RIBA Publications.
Martin, K., 1986. Urhügel, in *Lexikon der Ägyptologie*, VI, eds. W. Helck & E. Otto. Wiesbaden: Harrassowitz, 873–5.
Mellaart, J., 1967. *Catal Hüyük*. London: Thames & Hudson.
Michell, G., 1992. City as cosmogram: the circular plan of Warangal. *South Asian Studies* 8, 1–18.
Miller, D., 1985. Ideology and the Harappan civilisation. *Journal of Anthropological Archaeology* 4, 34–71.
Millon, R., 1973. *The Teotihuacan Map*, part 1: *Text.* Austin (TX): University of Texas Press.
Millon, R., 1981. Teotihuacan: city, state, and civilization, in *Supplement to the Handbook of Middle American Indians*, vol. 1: *Archaeology*, ed. J.A. Sabloff. Austin (TX): University of Texas Press, 198–243.
Millon, R., R.B. Drewitt & G.L. Cowgill, 1973. *The Teotihuacan Map*, part 2: *Maps*. Austin (TX): University of Texas Press.
Moortgat, A., 1969. *The Art of Ancient Mesopotamia*. London & New York (NY): Phaidon.
Murnane, W.J., 1995. *Texts from the Amarna Period in Egypt*. (Writings from the Ancient World 5.) Atlanta (GA): Scholars Press.
Mus, P., 1937. Angkor in the time of Jayavarman VII. *Indian Art and Letters* 11(2), 65–75.
Nims, C.F., 1965. *Thebes of the Pharaohs: Pattern for Every City*. London: Elek Books.
North, J., 1990. Diviners and divination at Rome, in *Pagan Priests*, eds. M. Beard & J. North. London: Duckworth, 49–72.
O'Connor, D.B., 1982. Cities and towns, in *Egypt's Golden age: the Art of Living in the New Kingdom (1558–1085 BC)*, eds. E.J Brovarski, S.K. Doll & R.E. Freed. Boston (MA): Museum of Fine Arts, 17–25.
O'Connor, D., 1989. City and palace in New Kingdom Egypt. *Cahiers de Recherches de l'Institut de Papyrologie et d'Egyptologie de Lille* 11, 73–87.
O'Connor, D., 1998. The city and the world: worldview and built forms in the reign of Amenhotep III, in *Amenhotep III: Perspectives on his Reign*, eds. D. O'Connor, & E.H. Chine. Ann Arbor (MI): University of Michigan Press, 125–72.
Ostrow, S.E., 1979. The topography of Puteoli and Baiae on the Eight Glass Flasks, *Puteoli* 4, 77–140.
Owens, E.J., 1991. *The City in the Greek and Roman World.* London: Routledge.
Paranavitana, S., 1950. Sigiri — the abode of a god-king. *Journal of the Ceylon Branch of the Royal Asiatic Society* (new series) 1, 129–62.
Parrot, A., 1956–59. *Mission archéologique de Mari.* (Bibliotheque Archeologie et Historique 70.) Paris: Institut Français d'Archéologie de Beyrouth.
Pasztory, E., 1997. *Teotihuacan: an Experiment in Living.* Norman (OK): University of Oklahoma Press.
Petrie, W.M.F., 1877. *Inductive Metrology; or, the Recovery of Ancient Measures from the Monuments*. London: Saunders.
Piankoff, A., 1954. *The Tomb of Ramesses VI*. (Egyptian Religious Texts and Representations 1. Bollingen Series XL.) New York (NY): Bollingen Foundation and Pantheon Books..
Piranesi, G.B., *c.* 1761. *Carceri d'invenzione di G. Battista Piranesi Archit[etto] Vene[ziano]*. 2nd edition. Rome.
Plato, 1970. *Republic*. Loeb trans., P Shorey. Cambridge: Cambridge University Press.
Plato, 1992. *Hippias Major*. Loeb trans., H.N. Fowler. Cambridge (MA) & London: Harvard University Press.
Pollitt, J.J., 1986. *Art in the Hellenistic Age*. Cambridge: Cambridge University Press.
Polybius, 1967. *The Histories*. Loeb trans., W. Paton. London: Heineman.
Porter, S., 1996. *The Great Fire of London*. London: Bramley [1998 ed].
Pusch, E., 1999. Towards a map of Piramesse. *Egyptian Archaeology* 14, 13–15.
Quigley, D., 1993. *The Interpretation of Caste*. Oxford: Oxford University Press.
Rangarajan, L.N., 1992. *Kautilya: the Arthashastra.* Delhi: Penguin Books.
Reddaway, T.F., 1951. *The Rebuilding of London After the Great Fire*. 2nd edition. London: Arnold. [1st edition 1940: Cape].
Ricke, H., 1935a. Der "Hohe Sand in Heliopolis". *Zeitschrift für ägyptische Sprache und Altertumskunde* 71, 107–11.
Ricke, H., 1935b. Eine Inventartafel aus Heliopolis im Turiner Museum. *Zeitschrift für ägyptische Sprache und Altertumskunde* 71, 111–33.
Rissman, P., 1988. Public displays and private values: a guide to buried wealth in Harappan archaeology. *World Archaeology* 20(2), 209–28.
Robichon, C. & A. Varille, 1936. *Le temple du scribe royal Amenhotep fils de Hapou,* I. (Fouilles de l'Institut français du Caire 11.) Cairo: Institut français d'Archéologie orientale.
Rodriguez-Almeida, E., 1980. *Forma Urbis Marmorea. Aggiornamento generale*. Rome: Quasar.
Rowe, C. & F. Koetter, 1978. *Collage City*. Cambridge (MA): MIT Press.
Rowe, W.L., 1973. Caste, kinship and association in urban India, in *Urban Anthropology*, ed. A. Southall. Oxford: Oxford University Press, 211–50.
Rowland, I. & T. Howe, 1999. *Vitruvius Ten Books on Architecture*. Cambridge: Cambridge University Press.
Rykwert, J., 1976. *The Idea of the Town: the Anthropology of Urban Form in Rome, Italy and the Ancient World.* Cambridge (MA): MIT Press.
Schaur, E., 1991. *Ungeplante Siedlungen: charakteristische Merkmale – Wegesystem, Flächenteilung/ Non-planned Settlements: Characteristic Features — Path Systems, Surface Subdivision.* (Mitteilungen des Instituts für leichte Flächentragwerke (IL) 39.) Stuttgart: Universität Stuttgart, Institut für leichte Flächentragwerke (IL).
Schlott-Schwab, A., 1981. *Die Ausmasse Ägyptens nach Altägyptischen Texten*. (Ägypten und Altes Testament

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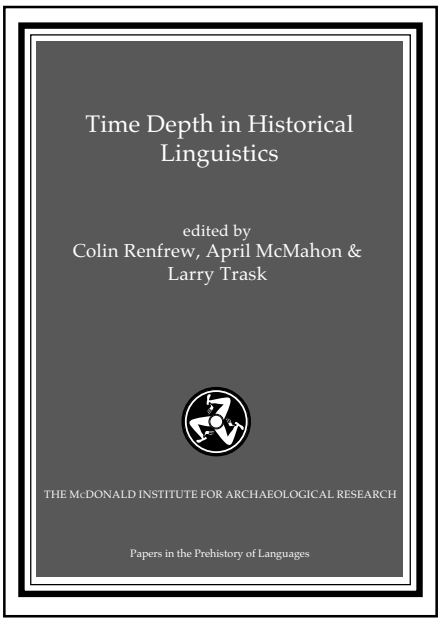
3.) Wiesbaden: Harrassowitz.
Schofield, J., 1993. *The Building of London, from the Conquest to the Great Fire*. Revised edition. London: British Museum Press.
Shaw, I.M.E., 1992. Ideal homes in ancient Egypt: the archaeology of social aspiration. *Cambridge Archaeological Journal* 2(2), 147–66.
Shrivastva, V.S., 1989. *Hinduism in South-East Asia.* New Delhi: Ramanand Vidha Bhawan.
Sliwa, J., 1992. Die Siedlung des Mittleren Reiches bei Qasr el-Sagha. Grabungsbericht 1987 und 1988. *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 48, 177–91.
Smith, B.K., 1994. *Classifying the Universe*. Oxford: Oxford University Press.
Soja, E., 1996. *Thirdspace. Journeys to Los Angeles and Other Real-and-Imagined Places.* Oxford: Blackwell.
Spence, K.E., 1998. Orientation in Ancient Egyptian Royal Architecture. Unpublished Ph.D. dissertation, University of Cambridge.
Stott, P., 1992. Angkor: shifting the hydraulic paradigm, in *The Gift of Water*, ed. J. Rigg. London: School of Oriental and African Studies, 47–57.
Sugiyama, S., 1993. Worldview materialized in Teotihuacan, Mexico. *Latin American Antiquity* 4(2), 103–29.
Tambiah, S.J., 1977. The galactic polity: the structure of traditional kingdoms in Southeast Asia. *Annals of the New York Academy of Sciences* 293, 69–97.
Taylor, R., 1967. Architecture and magic: considerations on the *Idea* of the Escorial, in *Essays in the History of Architecture Presented to Rudolf Wittkower*, eds. D. Fraser, H. Hibbard & M.J. Levine. London: Phaidon Press, 81–109.
Thapar, R., 1961. *Asoka and the Decline of the Mauryans*. Oxford: Oxford University Press.
Tilley, C., 1994. *The Phenomenology of Landscape.* Oxford: Berg.
Tobriner, S., 1972. The fertile mountain: an investigation of Cerro Gordo's importance to the town plan and iconography of Teotihuacan, in *Teotihuacan: XI Mesa Redonda*. México (DF): Sociedad Mexicana de Antropología, 103–16.
Trautmann, T.R., 1971. *Kautilya and the Arthasastra.* Leiden: E.J. Brill.
Uphill, E.P., 1998. The boundaries and orientation of Akhetaten, in *Proceedings of the Seventh International Congress of Egyptologists. Cambridge, 3–9 September 1995*, ed. C.J. Eyre. (Orientalia Lovaniensia Analecta 82.) Leuven: Peeters, 1191–5.
Vernant, J-P., 1982. *The Origins of Greek Thought*. London: Methuen.
Vickery, M., 1998. *Society, Economics and Politics in Pre-Angkor Cambodia*. Tokyo: The Centre for East Asian Cultural Studies for Unesco.
Vince, A., 1991. The development of Saxon London, in *Aspects of Saxo-Norman London*, vol. II: *Finds and Environmental Evidence*, ed. A. Vince. (Special Paper 12.) London: Museum of London & London and Middlesex Archaeological Society, 409–35.
Vitruvius, 1970. *De Architettura libri decem*. Loeb trans., F. Granger. London: Heineman.
Voegelin, E., 1974. *The Ecumenic Age*, vol. 4 of *Order and History*. London & Baton Rouge (LA): Louisiana State University Press.
Ward, S.V., ed., 1992. *The Garden City: Past, Present and Future*. (Studies in History, Planning and Environment 15.) London: Spon (Chapman and Hall).
Weinstock, S., 1971. *Divus Julius*. Oxford: Oxford University Press.
Wheatley, P., 1971. *Pivot of the Four Quarters: a Preliminary Enquiry into the Origins and Character of the Ancient Chinese City*. Edinburgh: Edinburgh University Press.
Wilkinson, R.H., 1994. Symbolic location and alignment in New Kingdom royal tombs and their decoration. *Journal of the American Research Center in Egypt* 31, 79–86.
Wiseman, T.P., 1995. *Remus*. Cambridge: Cambridge University Press.
Woolley, C.L. & M. Mallowan, 1976. *Ur Excavations: the Old Babylonian Period*, ed. T.C. Mitchell. London: British Museum Publications.

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The contributors, including leading historical linguists from all over the world, apply a wide diversity of approaches in a fresh initiative to confront one of the most intractable problems in their field.

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