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Settlement History and Urban Planning at Zincirli Höyük, Southern Turkey

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Abstract

This paper presents results of geophysical survey at Zincirli Höyük, a 40-hectare site in southern Turkey dating to the early first millennium BC. The site's lower town offers ideal circumstances for magnetic gradiometry, and survey results from this area, combined with the results of excavations from the 1890s on the central high citadel, now reveal a nearly complete plan of the ancient city. The results therefore present a unique opportunity to explore the relationship between the production of urban space and the social and historical forces that drove it. Our evidence from Zincirli strongly suggests a pattern of distributed authority in creating the built environment of the city, whereby the king and his administrators planned and constructed the circular walls, streets, and citadel, but according to which individual elite households were probably left to plan and build their own residential compounds. The spatial relationships of these features raise important questions regarding social organization at Iron Age Zincirli. The results also offer a model for understanding the unique spatiality of new cities that were founded throughout Syria and Anatolia during the early first millennium and highlight the relationship of Zincirli to these and other planned cities of the ancient Near East.

Keywords: *Iron Age, Turkey, archaeo-geophysics, magnetic gradiometry, urbanism, Neo-Assyrian , ancient cities*

Introduction

Ancient cities are among the most fetishized objects in archaeological research. Dating back at least to Fustel de Coulanges' *The Ancient City* (1874), they have been idealized, theorized, and broadly understood as a unified sociological and historical phenomenon. Within the field of archaeology, it was Childe (1946) who canonized a universalizing notion of ancient cities when he famously framed the development of complex societies within a series of 'revolutions'. Following the Agricultural Revolution when farming appeared, the Urban Revolution brought cities and hierarchical state-level societies. In the social evolutionary paradigm that Childe's work helped spawn, the city became a defining hallmark of a stage in human progress, intrinsically linked to the state (e.g. Adams 1966; Fox 1977; Trigger 1998). An archaeologically known culture could be defined as a state-level society if, alongside other criteria, a 'city' could be identified. Analysis centered, therefore, around how a city should be defined and whether specific archaeological sites qualified for the moniker. Within this intellectual framework, ancient cities came to be viewed in largely mechanical, materialist terms. Principles borrowed from geography, sociology and economics (e.g. Burgess 1925; Wirth 1938) could be used to model the spatial patterning of activities within an individual city in the same

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way that its location and relationship to other settlements in the region could be understood through the central place theory of Christaller (1933; see Marcus and Sabloff 2008). Any city was thereby immediately understandable, yet was divorced from its unique history, aesthetics and spatiality.

In his path-breaking work, *The Political Landscape* (2003), Adam T. Smith makes a radical departure from these earlier studies, arguing that the ancient city is not a conceptually unified entity but is instead essentially a product of modern scholarship. The City—with a capital C—is therefore an inappropriate object of study for archaeologists. Building on the works of Lefebvre (1991), Kostof (1991; 1992) and others, Smith (2003: 201-202) suggests that rather than seeking to find the common elements that constitute the conceptual heart of a city, we should be exploring how 'peculiarities in physical form, environmental aesthetics and representation were instrumental in constituting the authority of urban political regimes'. In a similar vein, M. Smith (2003) highlights the importance of archaeological research that focuses on analysis of ancient urban form as a means to access issues of power, social organization, economic interactions and the production of space. Numerous such studies in the Old and New Worlds have begun to reveal how analysis of the spatial patterning of activities and the production of built environments within urban neighborhoods do much more to inform our understanding of ancient settlement than does treating cities in the aggregate (e.g. Keith 2003; Moore 2003; Harmanşah 2005; Stone 2008).

Despite these possibilities for analysis of urban landscapes, there is often a disjuncture between the aspirations of archaeologists and the available data. Our knowledge of urban organization outside the monumental public buildings or major fortifications at most ancient cities remains frustratingly small. This issue is particularly acute in the ancient Near East, the proverbial heartland of cities, where architectural plans of pre-classical periods are few and far between. Cities of Hellenistic, Roman and later date are often sufficiently well preserved that their plans can be quite accurately reconstructed, as at Jebel Khalid, Syria (Clarke *et al.* 2002), al-Raqqa (Challis *et al.* 2002–2004) and many other sites (Ball 2001).

In contrast, earlier urban centers of the Near East were characterized by a long tradition of mudbrick-dominated architecture, which has meant that in most cases even major buildings and monumental streets are totally obscured below eroded construction materials (Liverani 1997). At the same time, long-term settlement at tells, often for several millennia, has left most occupational phases deeply buried by remains from later settlement. Furthermore, modern archaeological excavations, working far more systematically and scientifically than early projects, are generally unable to undertake open area excavations on the massive scale that would be required to expose ancient urban plans. Most discussions of urban organization in the ancient Near East therefore rely on the same handful of cases derived from large-scale excavations conducted in the early twentieth century; the past four decades of research would add few examples of urban planning to the examples discussed by Lampl (1968). These few settlements, ranging from small villages to massive cities and spanning several millennia, simply cannot be representative of the diversity of plans that must have characterized different periods, regions and cultures of the ancient Near East.

A few archaeological projects in recent years have sought to document urban organization over large areas using surface survey, aerial photography and sub-surface geophysics, as at Kerkenes Dağ (Summers and Summers 2005), Mashkan-Shapir (Stone and Zimansky 2006), Tell el-Rawda (Castel and Peltenburg 2007), Titriş Höyük (Algaze and Matney 1995) and Ziyaret Tepe (Matney and Donkin 2006; Matney and Rainville 2005; Matney *et al.* 2003). In particular, the near-surface geophysical

prospection techniques some of these researchers employed would seem to offer a solution to the lack of urban plans in the Near East because these methods have the ability to provide maps of buried architecture over large areas. The depth and complexity of most urban archaeological sites in the Near East, however, has rendered archaeo-geophysics far less effective than in other parts of the world. Most instruments commonly employed today only detect remains that are 1-2 m below the surface, while many Near Eastern sites possess cultural strata as much as 40 m deep. These strata contain cities of many different periods superimposed upon one another, further complicating efforts to utilize technologies such as magnetic gradiometry which only produce plans in two dimensions. While new approaches to geophysical investigation at tell sites offers the possibility to produce plans of architecture at much greater depths and in three dimensions (Casana *et al.* 2008), these techniques remain in development and are not widely employed. Our knowledge of urban organization in the ancient Near East therefore remains based on a frustratingly small sample.

This paper presents results of archaeo-geophysical survey at the site of Zincirli Höyük in southern Turkey (Figure 1), an ancient city that, due to its unique settlement history, architectural traditions and physical environment, is exceptionally well suited to magnetic gradiometry. The majority of the 40 ha site was occupied for only a relatively short period during the first millennium BC, resulting in a comparatively shallow accumulation of cultural materials. The lack of significant subsequent occupation has left remains of this phase in a relatively good state of preservation. In addition, most buildings at the site, ranging from large palaces to private houses, were constructed of basalt gathered from a nearby outcrop, a stone with a very strong magnetic signature, on top of alluvial fan and floodplain deposits that lack magnetic materials such as basalt. As our results illustrate, these conditions make Zincirli ideal for magnetic gradiometry. The plan of these shallow areas of the site, combined with the plan of monumental buildings recovered in excavations more than a century ago, reveal the organization of three quarters of the ancient city. Zincirli can now be added to the small list of archaeological sites in the Near East where nearly complete plans have been recovered using geophysical methods. Analysis of our results helps situate Zincirli within the urban traditions of the region and offers a revealing glimpse into the development and planning of ancient Near Eastern cities during the early first millennium BC. Our conclusions also demonstrate the potential for similar studies of the organization of urban centers to reveal the connections among the built environment, political power, social relationships, and settlement history in the ancient world.

Background

Zincirli (Zinjirli, Senjirli) Höyük is located at the northern end of the Kara Su Valley, the northernmost extension of the Levantine Rift Valley (Figure 1). The site, situated on the western side of the valley at the base of the Amanus Mountains, measures approximately 40 ha in area. The center of the site is dominated by an 8 ha, 10 m high citadel area and is surrounded by an extensive lower town, encircled by a massive, perfectly round fortification wall still visible at the surface in many areas (Figure 2). The lower town is only 1-2 m above plain level in most areas and is partially buried on its northwestern edge by recent alluvial fan aggradation.

Zincirli enjoys minor celebrity status among ancient Near Eastern specialists. It first became known to western scholars when visited by a German team in 1883 as part of the Commagene Expedition. Even in this first short visit, numerous monumental relief-carved basalt orthostats and sculptures were visible, eroding out of the site. Excitement surrounding these discoveries led to the launch of a German archaeological project, which worked for five seasons

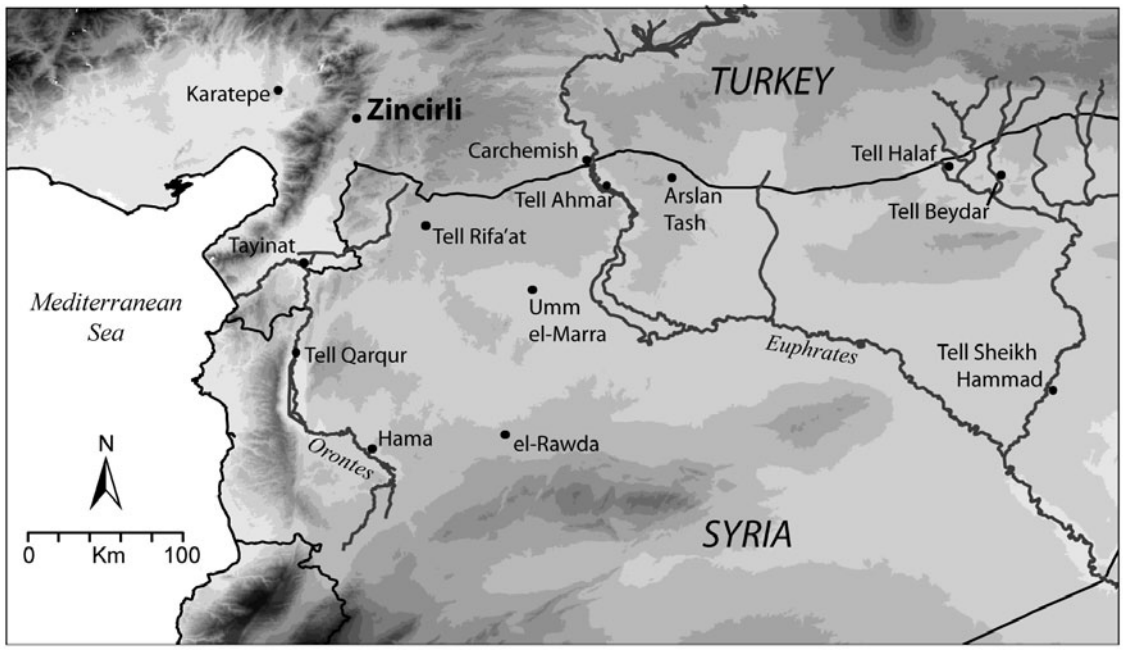

Figure 1. Locator map showing Zincirli and other major sites mentioned in the text.

Figure 2. Top: Photo of Zincirli fortification wall following excavation in 2006. Bottom: Geomagnetic survey being conducted in 2007. Both photos illustrate the relatively clear state of the lower town at the time of the survey. Photos courtesy of Neubauer Expedition to Zincirli.

from 1888 to 1902 (von Luschan *et al.* 1898; von Luschan 1893; von Luschan and Jacoby 1911; see Wartke 2005 for a recent summary). Excavating on a scale that seems incomprehensible to most modern archaeologists, the project uncovered a massive area of the site, focusing largely on the central citadel and monumental gateways in the south and northeast. Most of the fortification wall was also mapped by the team. These excavations recovered hundreds of basalt reliefs and statues (von Luschan 1902), as well as an enormous quantity of other small finds (von Luschan and Andrae 1943).

Finds from the German expedition revealed a great deal regarding the chronology of the site and the history of the larger region. While the central mound was occupied since at least the Early Bronze Age in the third millennium BC, the earlier phases of the site are largely obscured by a major Iron Age settlement, initially founded during the tenth century BC and continuing through the seventh century BC (Schloen and Fink 2007; Lehmann 1994). The discovery of numerous historical inscriptions—written in Akkadian, Luwian hieroglyphics, and a local dialect of Aramaic—reveal that the ancient name of the site and its kingdom during the Iron Age was Sam'al, a toponym also known from Neo-Assyrian royal inscriptions. Finds from the expedition form an art historical collection of great significance, and the epigraphic materials have generated much scholarship by philologists and Biblical scholars over the past century. Despite the academic interest in Zincirli, until recently there were no further archaeological investigations after the close of the German expedition in 1902. Early excavations concentrated almost entirely on the central mound, most of which was at least partially exposed, revealing the plan of the citadel during several phases in the Iron Age. In the lower town, however, the Germans restricted their excavations to two monumental gateways and one long test trench across the southeastern part of the site. In 2006, a University of Chicago/Oriental Institute team began a new, large-scale archaeological project at the site (Schloen and Fink 2007; 2009), and the geophysical investigations reported herein were undertaken as part of this project during the 2007 season.

As discussed above, the lower town at Zincirli is uniquely well suited to magnetic gradiometry survey owing to its relatively short-lived occupation, shallow depth, and large basalt buildings. Today, a village has grown up on the central mound and also covers several hectares of the western portion of the lower town. The remainder of the lower town, however, is reserved for cultivation of wheat or is left uncultivated as part of the archaeological heritage site (Figure 3). One paved road and a second gravel road cross part of the lower town, and its eastern edge has been damaged by the construction of a large irrigation canal in recent years. Aside from these intrusions, the lower town is largely free from obstructions and was accessible to geophysical survey at the time of our fieldwork.

Methodology

Survey at Zincirli Höyük was conducted with a Bartington 601-2 magnetic gradiometer, an instrument specifically designed for mapping magnetic archaeological deposits. This instrument has two sensors mounted on a beam separated by one meter, enabling the operator to survey two transects while only walking one. One third of the geomagnetic survey was conducted with only one sensor; two-sensor survey commenced after our equipment was repaired. For this survey, the gradiometer was set to be sensitive to magnetic variation to 0.1 nanotesla (nT) within 10 nT of the zero-centered mean. Readings above 10 nT were recorded to 1 nT precision and readings above 100 nT and below −100 nT are clipped.

Each survey grid is a 20 × 20 m square consisting of 40 transects oriented east-west, spaced 50 cm in a north-south direction. In every case, survey began in the southwest corner of the grid and succeeding transects were surveyed in the

Figure 3. Quickbird satellite image of Zincirli and geomagnetic survey areas completed in 2007. Note that the modern village on the site obscures the western portion of the lower town.

opposite direction to the previous in a 'zig-zag' pattern. Complete survey of a 20 × 20 m grid produces a map of magnetic intensity organized on a grid with 40 rows and 160 columns. Survey was restricted to areas where archaeological features were believed to be relatively unmolested by modern activities and where the surface was free of obstacles. Transects and grids were truncated when obstacles such as deep ditches, ponds, tall vegetation or structures made the area impassable. In the end, survey primarily covered the wheat fields to the east of the modern village and open areas to the south of the central acropolis. By the end of the seven-week 2007 field season, 505 20 × 20 m squares had been surveyed, covering a total of 20.13 ha (Figures 3-4).

Data were downloaded from the Bartington Grad 601-2 using associated Bartington software. This software reorganizes data collected in a zig-zag pattern into a grid. Data were downloaded in .dat (surfer) format, and each grid includes a header file (.hdr) that records the instrument settings for each 20 × 20 m square. Data were geo-referenced and pieced together to produce

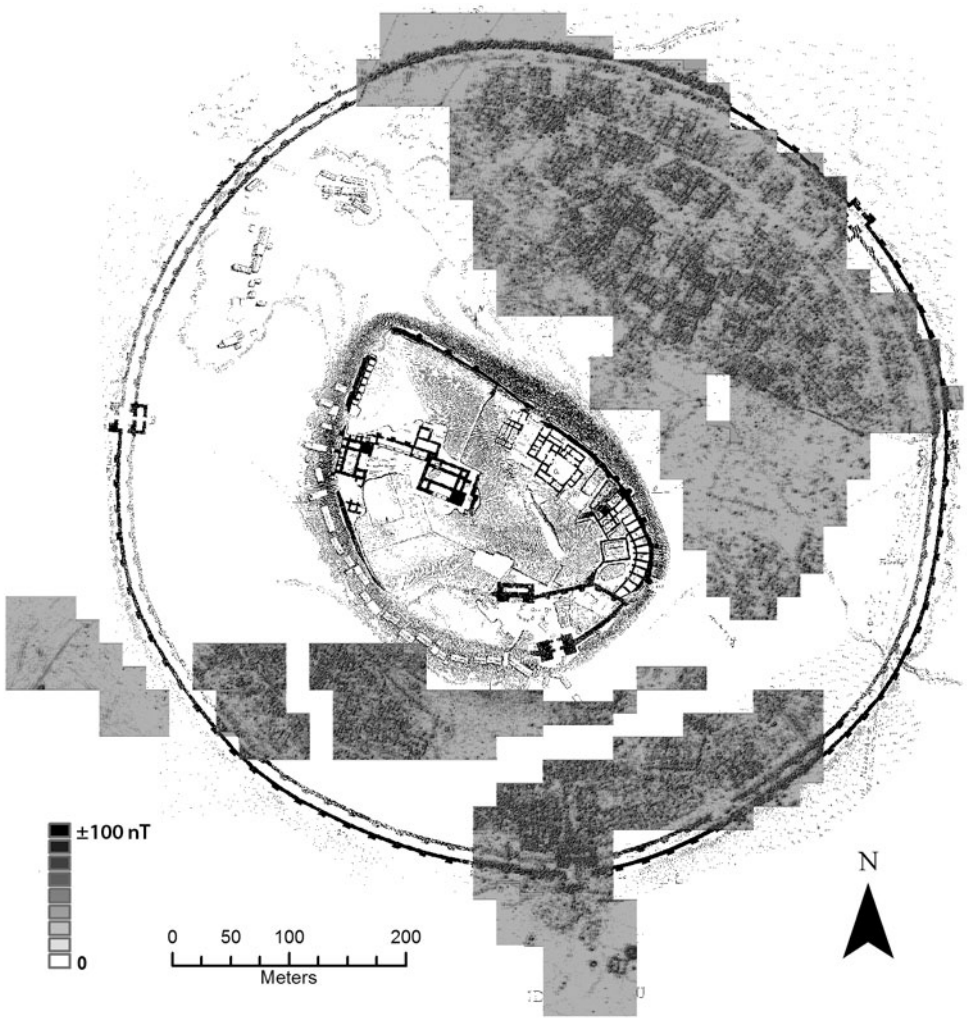

Figure 4. Geomagnetic map overlaid on a plan of the site produced by the German expedition in the 1890s. Geomagnetic data have been processed to highlight major features.

a large map of the entire site using IDRISI Andes (version 15.0) created by Clark Labs, a raster-based GIS software designed for image processing and spatial analysis (Figure 5a). The first step in processing these data was to remove directional noise, produced by slight variations in instrument settings and calibration during the survey and which appears as striping in each grid. This striping was removed using a moving window filter (Oimoen 2000) rather than the more commonly used zero mean traverse, enabling more adaptable sampling to drastic changes in magnetism and rendering results less likely to introduce interference in the form of striping during processing (Figure 5b). Mosaic effects between individual grids were removed using simple map algebra and grids were then concatenated to create a larger coverage map. For some images, the geomagnetic data are manipulated to show the absolute value of magnetism for anomalies beyond a threshold of 30 nT from the mean (0 nT) in order to emphasize architectural features interpreted as being composed of basalt (Figure 5c).

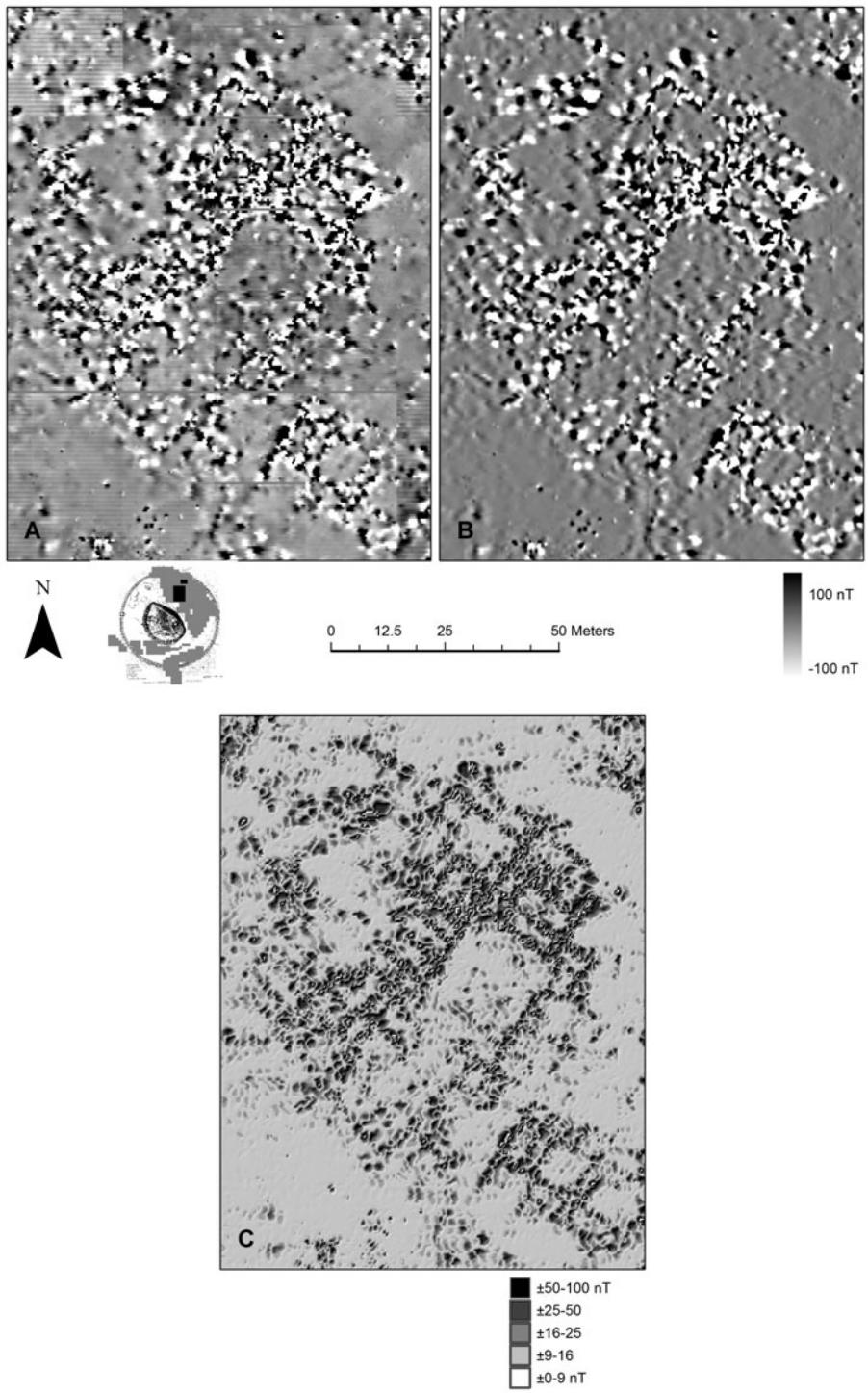

Figure 5. A large building in the lower town at Zincirli, as it appears in (a) a raw, unprocessed image; (b) the same image after removal of directional noise and filtering; and (c) the image where the absolute value of magnetism is displayed to highlight large magnetic anomalies.

Results

General Organization and Preservation

Geomagnetic survey in the lower town at Zincirli was successful in revealing the architectural plan of the site and the effects that modern land use practices have had on site preservation (Figure 4). The clearest view of Zincirli's plan was obtained in the north and northeastern portions of the site where regular plowing and field clearing for agriculture have kept the surface relatively free of rubble and trash. In the southernmost sections of the survey area, architecture is also visible but the data are more cluttered, probably because these areas, being preserved as an archaeological heritage site, have not been cultivated over the past century, leaving them strewn with rubble and trash. The easternmost survey area, where there is a notable absence of clear, well-preserved architecture, stands in stark contrast to the northern and southern sections. Several faint features are visible here, suggesting that the area may once have held similarly dense architecture as seen in the north and south of the site. The fact that the extents of this architecture-poor area match the boundaries of a modern agricultural field provides further evidence that this field was subject to a more vigorous plowing and clearance routine in recent centuries than the adjacent fields were.

Aside from the eastern area of the lower town, the entirety of the lower town area within the ancient fortification walls was fairly densely occupied, especially compared to sample areas outside the walls. In one area surveyed to the west of the walled portion of the site, virtually no archaeological features are visible. Survey outside of the south gate, however, revealed several rectilinear buildings as well as the remains of what may be an ancient road (Figure 6). Results of recent excavations suggest that the square structure is likely the remains of a temple (Schloen and Fink 2009).

Fortifications

The fortifications at Zincirli, just visible at the surface in many parts of the site, appear quite clearly in geomagnetic data. The German expedition carefully mapped much of the fortification walls, which encloses an area of about 40 ha. The fortifications feature a double wall, each measuring approximately 3 m in width with a 7 m area between them, presumably so that if the outer wall were breeched during a siege, attackers would be trapped between the two. Excavations undertaken in 2006 show that the outer wall is preserved to as much as 3 m in height, probably a foundation upon which an even taller mudbrick superstructure was built (Schloen and Fink 2007; 2009). Both walls have 100 evenly spaced towers protruding from them, creating positions for archers to assail attacking forces.

The geomagnetic map reveals that the inner fortification wall generally has a weaker magnetic signature than the outer wall, due to its greater depth from the surface and the fact that is was constructed of smaller stones (Figure 7). Magnetic data also reveal several apparent breaks in the inner wall, one about 100 m east of the southern gateway and another at the northern edge of the site, both measuring about 20 m across. If these openings were actually part of the plan of the fortifications, they might have enabled defenders to have access to the space between the walls in the event of a siege.

There are three major two-chambered gateways in the fortification system. The western gate is today completely obscured by the modern village, and the northeastern gate was only partially covered by magnetic survey because excavation was being conducted there during the 2007 season. The southern gate appears clearly as a result of excavations by the German expedition, removing all of the standing architecture and clearing archaeological deposits down to floor surface on its eastern side (Figure 6). A subsequent excavation of the area illustrated the precision of the geomagnetic data as virtually every stone exposed in the shallow excavation can be accounted for in the geomagnetic map (Schloen and Fink 2007; 2009).

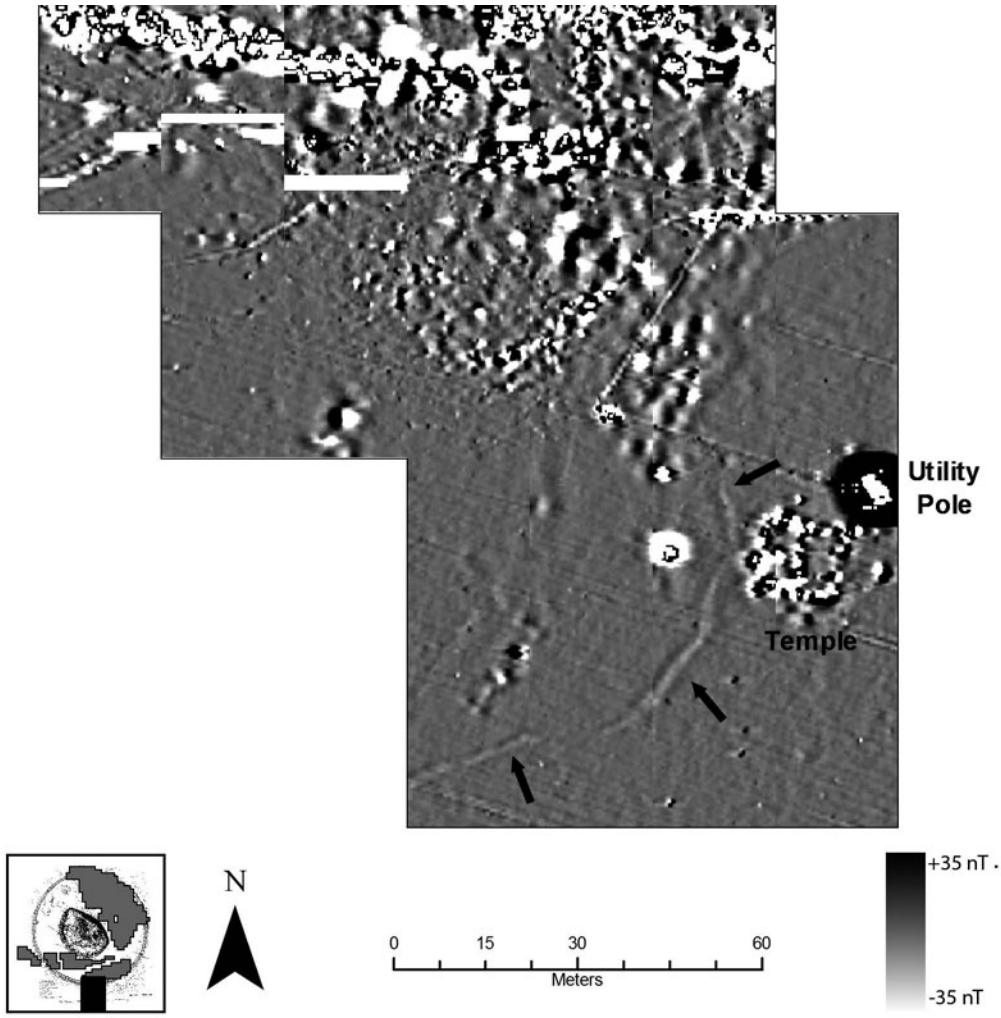

Figure 6. Close-up of southern gateway and area outside the city wall where a small temple was discovered and a possible roadway feature appears (indicated by arrows).

Roadways

Several features that appear to be planned roads through the city are visible in magnetic gradiometry data. The most obvious of these are two circular tracks that follow the course of the outer fortification wall (Figure 7). Just inside the inner fortification wall, there is a 7 m-wide space that is largely free of architecture or other features. In most areas of our survey this road, apparently providing access to fortifications, is visible. A second circular road of approximately the same width can be traced at around 30 m inside the outer road. This inner loop is most evident in the northeastern part of the city where structures face the road and rarely block it. Both roads can also be traced in the southwest, although cluttered data caused by rubble on the ground surface make them less obvious. At the northern end of our survey area, several buildings block the path of the road, while in the southeast, the outer ring road is readily apparent, but no trace of the inner loop can be seen. It is tempting to envision the outer and inner ring roads as planned communication routes circling the

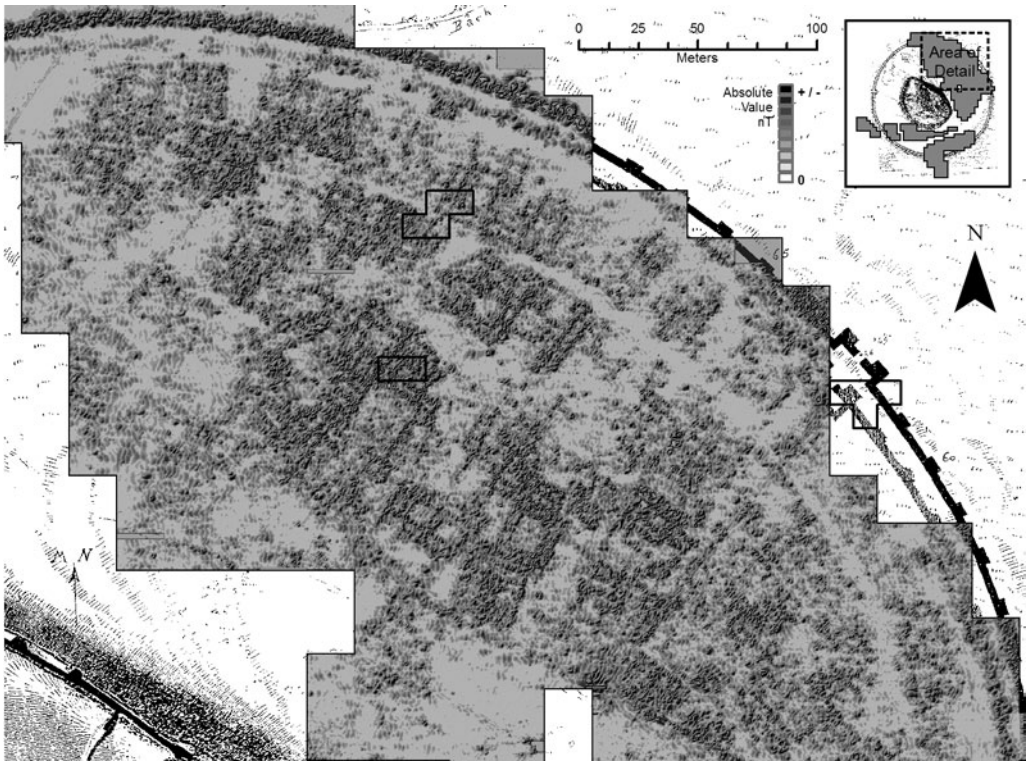

Figure 7. Close-up of the northern lower town where three circular, concentric streets are visible within the city walls. Boxes indicate areas of 2008 excavations.

entire city, nested within the well-planned circular city wall. If this were the case, it may be that over the several centuries the city was occupied, the original circular plan of the roads was eroded as successive generations gradually built into them, blocking them in various quarters.

We must also note the rarity of other formal, planned communication routes through the city. There is one road that seems to connect the southern gateway to the citadel, and excavations in this area show that it was at least partially paved, signaling its monumental character. It may represent the remains of a ceremonial, processional road (Schloen and Fink 2007; 2009). Gradiometry survey extended more than 100 m south of the gateway and revealed evidence for what may be a continuation of this road in the form of an unpaved trail leading out of the city towards a square building that could be a small temple, indicated by the discovery of an orthostat in its vicinity and test excavations by the Chicago team (Figure 6; Schloen and Fink 2009). Apart from the road leading from outside the southern gate towards the citadel, there are few other roadways evident in geomagnetic data within or outside the city; if such roads were originally part of the urban plan, they were later obscured by construction and agriculture.

Buildings and Planning

The degree to which extant architecture visible in geomagnetic data is the product of a single, centrally planned building phase versus a palimpsest of modifications over several centuries of occupation remains uncertain. While the German excavations on the high mound show that it has a long history of settlement dating back into the second and third millennia BC,

the extensive lower town has yet to show any evidence of pre-Iron Age settlement. The relatively shallow stratigraphy in this part of the site combined with the clarity of architecture supports the interpretation that there are not many multiple, superimposed phases of occupation in the lower town. Ongoing excavations at Zincirli will ultimately provide much more secure dating for many of the buildings evident in geophysical survey data, but some preliminary conclusions can be suggested already. Recent excavations by the Chicago team show several phases of use and reworking of buildings, as in the house containing a mortuary stele, the so-called Kuttamuwa stele (or more properly, *'KTMW'*—Struble and Herrmann 2009; Pardee 2009). The house is dated to the later eighth century BC and excavated portions of it and the surrounding architecture show a near perfect correspondence with geophysical data (Figure 8). The southern building, where the stele was found, seems to form part of a household group with numerous discrete building units accessible via a central alleyway. The buildings all have several phases of flooring, and the room organization and function changed several times over the use-life of the building. These findings suggest that at least some of the buildings visible in magnetic data may have had relatively long histories of use. The shallow nature of the deposits in general, however, suggests that this history may have only been across a century or two.

In several parts of the survey area, particularly in the northern portion of the site, the plan of complete buildings is visible (Figures 5 and 8). Many of these structures appear to have had a central courtyard area surrounded by banks of rectilinear rooms. Most courtyard areas are 3-5 m on a side, while the largest such features measure more than 25 m on a side. Many structures seem to have formed discrete compounds with relatively open spaces between them, unlike the agglutinative style typical of many ancient Near Eastern towns in which domestic houses abut shared walls. The orientation of the buildings is non-uniform, with some designed to face circular roadways and others positioned in what appears to be a more ad hoc fashion. The size of most house compounds is considerable, measuring from 40-150 m on a side. It is notable that the size and plan of the house compounds in the lower town is quite similar to the 'Upper' and 'Lower' palatial buildings excavated on the high citadel. Both of these palaces possess large central courtyard areas flanked by banks of rectilinear rooms, arranged in a non-orthogonal, asymmetric manner (Figure 9a-b). Several of the house compounds in the lower town are considerably larger than the Upper Palace on the citadel, and approaching the size of the Lower Palace.

The plans of building compounds have numerous parallels at contemporary sites in north Syria. The large houses of the lower town (illustrated in Figures 5 and 9a) and the Upper Palace at Zincirli (Figure 9b), characterized by banks of rectilinear rooms built around a large central courtyard, have close parallels with buildings of the Neo-Assyrian period (ninth-seventh centuries BC). We could look directly to the Neo-Assyrian capitals such as 'Residence M' at Khorsabad, a large residential compound outside the Nabu Temple (Loud and Altman 1938: pl. 73) or to palatial buildings at outlying centers such as that uncovered at Ziyaret Tepe (Matney and Donkin 2006) and the slightly later 'Red House' from Tell Sheikh Hamad (Figure 9c; Kühne 2000). Parallels can also be found in older excavations at Tell Ahmar (Thureau-Dangin and Dunand 1936) and Arslan Tash (Thureau-Dangin *et al.* 1931), where palatial complexes of a plan and scale similar to those at Zincirli, and dating to approximately the same time period, have been uncovered. The plans of domestic buildings at Zincirli stand in contrast, however, to most examples known from the northern Levant, as at Chatal Höyük or Tell Judaidah (Haines 1971), where buildings tend to be much smaller and densely clustered. Even in cases where palatial buildings of the

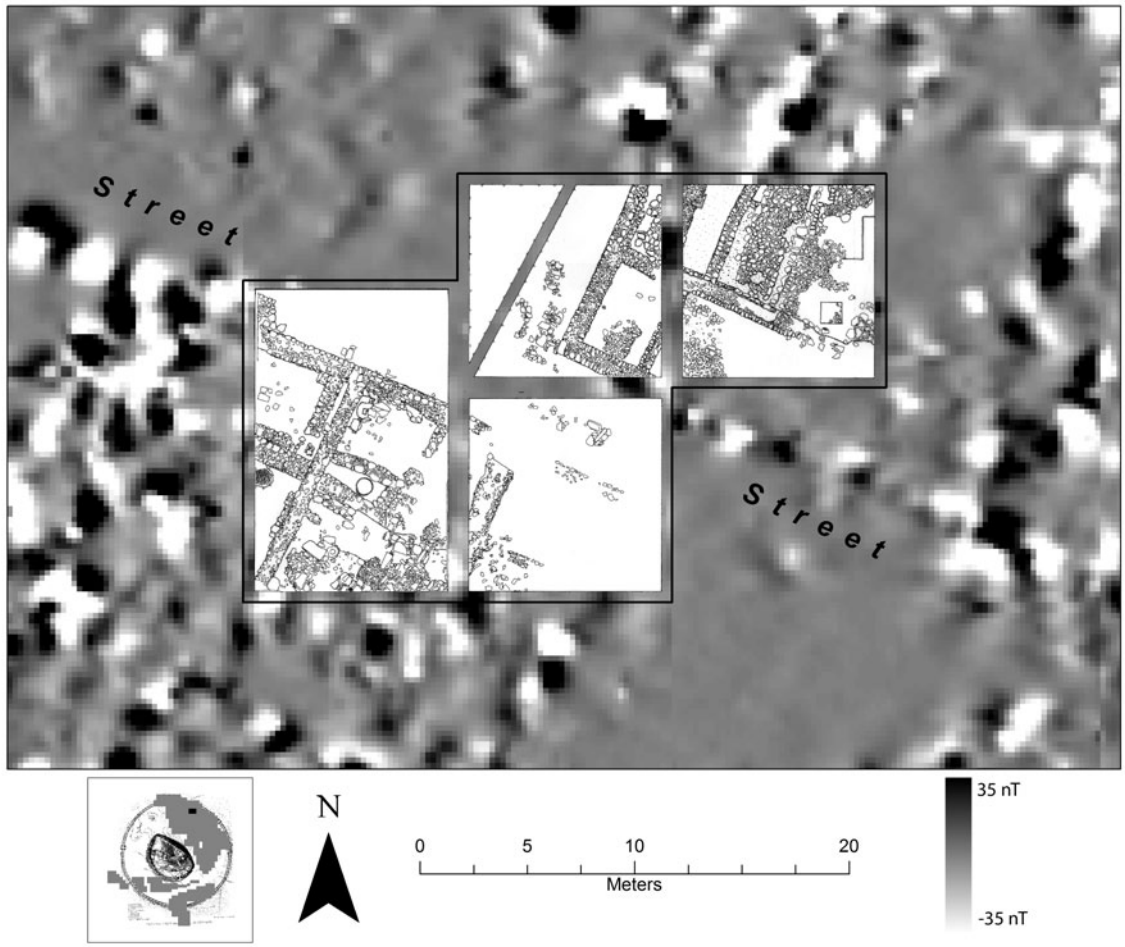

Figure 8. Two buildings in the northern lower town with 2008 excavations overlaid. The building on the southern side of the road, apparently a moderately sized domestic building with attached shrine, was where the University of Chicago team discovered a monumental mortuary stele.

early first millennium BC have been found at Levantine sites, as at Hama (Figure 9d), they are also quite different in plan from the palaces and large houses at Zincirli. It is notable that the best parallels for the Zincirli buildings seem to come from eastern areas, as this may lend support to the arguments of numerous scholars that Zincirli was settled by Aramaean peoples who moved west from their traditional homeland in the Euphrates Valley (e.g. Dion 1997; Lipiński 2000). On the other hand, Schloen and Fink (2009: 9-11) argue that there is little reason to assume that Zincirli was occupied by Aramaean conquerors and that inscriptional evidence points instead to the development of a local West Semitic culture.

Recent excavations show that despite their impressive size, even the largest buildings in the lower town were likely domestic structures (Schloen and Fink 2009; Struble and Herrmann 2009). Excavated rooms from the large house illustrated in Figure 5 contained stone grinders, storage jar fragments and other evidence of domestic activities. Notably, it was in the smallest of the three excavated buildings where the Chicago team uncovered the monumental

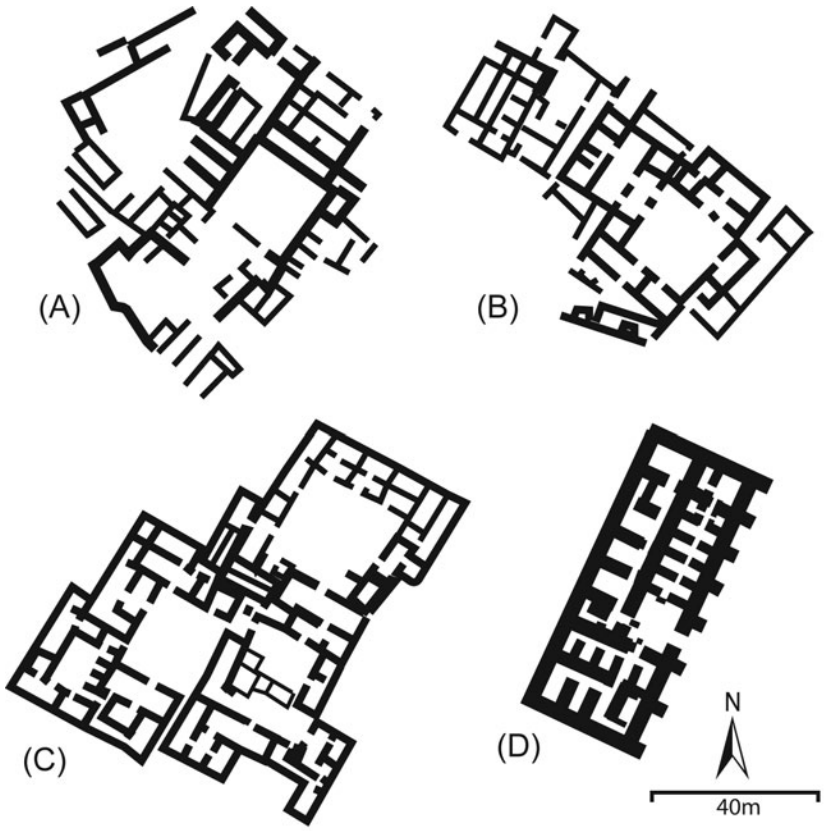

Figure 9. Comparison of (a) a large building evident in geomagnetic data, the plan of which has been derived from magnetic data illustrated in Figure 5; (b) the Upper Palace excavated at Zincirli in the 1890s; (c) the 'Red House' from Tell Sheikh Hamad in eastern Syria; and (d) the Iron Age palatial building from Hama in western Syria.

mortuary stele, featuring an inscription identifying the house's resident as a high official (Struble and Herrmann 2009).

The fact that even smaller houses seem to have been occupied by elite members of Zincirli society leaves us to wonder where non-elite residents lived. In the southwestern part of the survey area, geomagnetic data do not reveal the plan of individual buildings as clearly as in the northern part of the site. Instead data are cluttered and noisy, raising the possibility—on the one hand—that houses in this part of the site were smaller and more closely packed together, and may therefore have been home to a lower-status community. On the other hand, the areas of more cluttered geomagnetic data correspond to the parts of the site protected as an antiquities area and have therefore not been farmed over the past century. The lack of farming has left the southwestern part of the site with a rockier, more litter-strewn surface than in active agricultural fields, suggesting that the differences we see in geomagnetic data may be a product of differing land use in recent decades rather than in how space was utilized during the Iron Age. If these southern portions of Zincirli are home to buildings of similar plan to those in the north, we would be left with the impression that the entire lower town was occupied by relatively powerful families with large houses, and that non-elite members of society must either have lived within these large households, at other small sites in the region, or possibly even outside the city walls in tents or other non-permanent structures.

The resolution to this issue must await results of ongoing excavations, which plan to uncover portions of buildings from all parts of the site.

Discussion

The emergence of Zincirli as an urban center in the early first millennium BC must be understood first and foremost within the historical and cultural context in which it was founded and built. Recent excavations at the site strongly suggest that the part of the site covered by the citadel during the early first millennium BC was abandoned at the time the historic city of Sam'al was founded, probably during the ninth century (Schloen and Fink 2009: 8). The underlying mound shows evidence of occupation during the mid-second millennium BC, and probably earlier, but ceramic data suggest a gap in occupation of around three to four centuries (Lehmann 1994). The city of Zincirli, with its massive fortifications and expansive lower town, is likely an example of a new urban foundation, rather than the expansion of a pre-existing city.

Throughout most of ancient Near Eastern history, the foundation of new urban centers like Zincirli was a relatively rare event. Archaeological survey data from the northern Levant show that most urban centers in the region remained stable loci of settlement throughout the third, second, and early first millennia BC (Casana 2007). In Mesopotamia, founding new cities was considered an act of monumental hubris, one that would likely result in retribution by angry deities (Van de Mieroop 1999: 59; A. Smith 2003: 203-206). Beginning in the late second millennium BC, however, the Near East witnessed a rash of new urban foundations, particularly in the Assyrian heartland of northern Mesopotamia and in the adjacent areas of Syria and Anatolia occupied by Neo-Hittite and Aramaean states—the remnants of the Hittite Empire that once ruled the region (see Hawkins 1995).

The best known new foundations are those of the Neo-Assyrian monarchs, first at Kar Tulkulti-Ninurta founded by Tulkulti-Ninurta II between 1233–1197, followed by Nimrud (Kalhu) founded by Ashurnasirpal II in 880 BC, Khorsabad (Dur-Šarrukin) founded by Sargon II between 717–706 BC, and finally Nineveh, made the capital by Sennacherib in 700 BC. Kar Tulkulti-Ninurta and Khorsabad were both founded on previously unoccupied ground, while both Nimrud and Nineveh were established at pre-existing settlements; all of these ventures involved a massive investment of resources. The cities were spectacular in scale, ranging from 300 ha (Khorsabad) to 750 ha (Nineveh), and all boasted extraordinary monumental architecture, fortifications, gardens, and waterworks. This sudden flurry of new urban foundations is rather striking, particularly when compared to the long-held taboo on the practice, and for this reason it has been the subject of much recent discussion (e.g. Mazzoni 1994; Bunnens 1996; Barbanes 1999; Novak 2004; Harmanşah 2005).

The practice also seems to have been paralleled by a similar activity to the west in Syria and Anatolia. While the new cities of these regions lack the rich historic accounts preserved in the Neo-Assyrian palaces and tend to be considerably smaller (ranging from around 40-100 ha in size), the similarity in vision between the two is undeniable. New capital cities of small states, whether Neo-Hittite, Aramaean or some other ethnic group, were either founded at greatly expanded settlements or on previously abandoned tells as witnessed at Tell Halaf (Langenegger *et al.* 1950), Tell Rifa'at (Seton-Williams 1961; 1967), 'Ain Dara (Abu Assaf 1990; Stone and Zimansky 1999), Karatepe (Bossert *et al.* 1950), Tell Ahmar (Thureau-Dangin and Dunand 1936), Tell Ta'yinat (Haines 1971; Harrison 2001; 2009) and Carchemish (Woolley 1921).

All of the Syro-Anatolian sites feature an elite citadel with palaces and temples and most were built on an earlier Bronze Age tell. The above sites also had extensive lower towns, fortified settlements surrounding the citadels that were occupied primarily during the Iron Age. It is

among these cities that we see the best parallels for Zincirli. For example, at the nearby site of Tell Ta'yinat, capital of a contemporary Iron Age kingdom, excavations have revealed that an Early Bronze Age (third millennium BC) mound was reoccupied in the tenth or eleventh century BC, during which time the old tell served as the home to a Bit-Hilani-style palace and related temples (Haines 1971; Harrison 2001; 2009). Monumental basalt sculptural reliefs and architectural fragments, with many parallels to those found at Zincirli, were recovered from excavations on the high mound. During this period, an extensive lower town surrounded the citadel, which was fortified by a city wall enclosing an area of about 40 ha, roughly the same size as Zincirli. Certainly, Zincirli must be seen as fitting into this general cultural tradition and urban form.

Following Joffe's (1998) analysis, the new cities of the Iron Age have sometimes been regarded as 'disembedded capitals' (Van de Mieroop 1999: 59-61; A. Smith 2003: 203-205; Wilkinson *et al.* 2006: 26), in a somewhat more constrained manner than Blanton's (1976: 257-58) original introduction of the concept for Monte Alban in Mexico. According to the disembedded capital model, new urban foundations are designed to restructure and reorient the political and economic landscape by physically removing centers of administration, cult and politics to a new location. This may be a good characterization of at least part of the Neo-Assyrian and Syro-Anatolian kings' decisions to found new cities, but the mechanics involved in actually constructing such a city remain poorly understood. After all, a sufficiently powerful monarch can compel his followers to undertake construction of monumental buildings and defensive works, but he cannot bring the city to life; he cannot fill the streets with teeming masses.

The writings of Neo-Assyrian kings, while offering rich historic accounts of their building enterprises, do not offer much insight into the urban fabric of their new cities. For instance, in Ashurnasirpal's description of his new capital at Nimrud, recorded on a monumental inscription known as the Banquet Stele (Grayson 1991: 288-93), he offers detailed information about the construction of his palace, numerous temples, major canals, a massive garden, the acquisition of exotic animals for his royal hunts, and the establishment of festivals and feasts, but there is almost no mention of the city's residents, nothing about the citizenry, architecture and streets that presumably would have populated the lower towns. Archaeology has not helped fill the cities with residents either, as excavators traditionally have focused attention primarily on citadels and monuments. This bias in archaeological data creates a kind of echo chamber, reinforcing the propagandistic claims of the founders themselves and leading some early scholars to assume that the cities' lower towns were largely empty (e.g. Burckhardt 1905: 65; and see Liverani 1997). Today researchers still have little recourse but to concentrate their analyses on monumental public works rather than on the fabric of neighborhoods and residential areas (e.g. Harmanşah 2005; Gates 2003; Bunnens 1996).

The new data from Zincirli thus offer a first glimpse of the built residential space in the new Iron Age cities outside the citadels; they therefore give a unique perspective on the development of Zincirli and other similar sites. If a group of ancient Near Eastern scholars were to have guessed how the lower towns of the new Iron Age cities were organized, opinions would have certainly diverged. Some would have pointed invariably to the organic winding alleys of Old Babylonian Ur, and supposed that the fortified lower towns would have been filled with similarly dense neighborhoods. Others, inspired by James C. Scott (1999), might have suggested that the top-down, planned construction of the cities implies a likely geometrical arrangement of streets and buildings. To think of cities as planned versus unplanned may in fact create a false dichotomy. Spiro Kostof (1991: 10, 70-71) famously cited the example of Siena, Italy, where

modern visitors marvel at the seemingly organic nature of the city streets, but which began as a formally planned geometric settlement.

A. Smith (2003: 225-26) rightly reminds us that all built spaces are planned at some level, whether by an individual family or by a centralized zoning bureaucracy. The question may thus be better phrased around who made planning decisions and what were the underlying principles that guided those decisions. At a place like Old Babylonian Ur, a centralized power planned the city's walls, temples, and palatial buildings, but individual neighborhoods were governed largely like villages, where decisions about the allocation of space were left to the kin groups who occupied the neighborhoods (Stone 1981; Keith 2003). This more distributed spatial power, combined with what presumably was an aesthetic that favored a certain style, size, and plan of domestic residence, resulted in the seemingly unplanned nature of the residential areas of the city.

At Zincirli, the perfectly round fortification wall and the manner in which the interior streets of the city mirror its course clearly attest to a significant stamp of authority on the organization of the lower town. The individual building units, however, show far less adherence to geometric principles. Some buildings front onto circular streets, while others seem to be placed more haphazardly within the fortifications. Occasionally, buildings completely block the presumed course of the street. We could argue that because we are seeing a palimpsest of the city—all of its use history flattened onto a single two-dimensional magnetic map, deviations from a regular plan are a later development, akin to Kostof's (1991: 70-71) example of Siena. New excavation results, however, show that Zincirli's lower town probably had a very short occupational history, perhaps less than a century, and thus we would expect to see more elements of an original geometric plan in residential areas, had one ever existed. It may be more likely that we are simply witnessing the result of embedded planning by multiple authorities. The large fortifications, the citadel, the gateways, and the circular streets were undoubtedly planned by the king and his administrators. Based on the relationship of the house blocks in the lower town to these features, we can also conclude that the fortifications and streets were constructed prior to the houses, rather than having subsequently surrounded a group of residences already clustered at the base of the citadel. Moreover, as discussed above, the individual house blocks themselves are by and large quite grand in scale, and excavated evidence, particularly the Kuttamuwa Stele (Schloen and Fink 2009; Struble and Herrmann 2009), points to the fact that even smaller houses on the periphery of the lower town were occupied by elite members of society.

Schloen (2001) argues that during the Late Bronze Age (1450–1200 BC), immediately preceding the founding of Zincirli, many Near Eastern polities were organized through a patrimonial household model. Political power, access to land, and much of the productive economy were all structured around kinship ties among extended patrimonial families arranged hierarchically from the king downwards. If Schloen's reconstruction is correct and if a similar form of social organization persisted into the early Iron Age (a period with a less robust historical record), it may provide a framework for interpreting the spatial patterning of the urban landscape at Zincirli.

The residential housing blocks in the lower town, then, may have been the residences of prominent patrimonial households, a fact which would help to explain the apparent absence of spatially manifested class distinctions, because everyone within the city—rich or poor—would have been connected to and resided in one of these households. Such an explanation would also help to interpret the heterarchical nature of planning in the city. While the king's household would have planned and constructed the fortifications, roadways, and monumental buildings, individual households would have subsequently

constructed and planned their own residences. It would be interesting also to consider how it was that these particular households came to be those that established residence within the city. Were they elite families from the region who were privileged by the opportunity to reside within the bosom of the king's household? Were the king and the other households all members of a foreign Aramaean ethnic group that conquered the region and thus resided within the walls of Zincirli, like knights within a medieval castle, exploiting the peasantry in the surrounding countryside? Or is it possible that many of the houses were not even permanently occupied, and that their construction by elite families was more a symbolic gesture to demonstrate their fealty to the king? Future excavations at the site will undoubtedly seek to explore these issues further and may yield additional insights into the preliminary interpretations we offer here.

Our new evidence for the organization of space at Zincirli and our suggestions for its interpretation raise questions of whether the site offers a good model for how other new Iron Age cities were organized. As noted above, Zincirli bears many similarities in plan and aesthetic to the rash of contemporary urban foundations of the early first millennium BC, and we might therefore assume that the lower towns at other Neo-Hittite and/or Aramaean cities were similarly organized. Zincirli, however, differs significantly from many of the other contemporary new cities in the region, as few of them exhibit the geometric planning evident in Zincirli's fortifications and streets. Figure 10 illustrates a Cold War-era CORONA satellite image of Zincirli alongside several other sites discussed below; these images offer high-resolution views of the archaeological landscape from the 1960s, prior to the destruction of many sites and features by modern development (Casana and Cothren 2008). Most other similar Neo-Hittite or Aramaean cities such as Tell Ahmar (Figure 10b), Tell Ta'yinat (Figure 10c), Ain Dara, Arslan Tash, Karatepe and others possess fortified lower towns, but the walls do not appear to have been built according to a geometric plan. It is possible that in these cases, the lower town fortifications were only built after people had settled at the base of the citadel, thus requiring the wall to surround an existing settlement.

In contrast, the new Neo-Assyrian foundations show great concern for geometrically patterned urban planning, as at Khorsabad which is nearly a perfect square aligned on cardinal directions, and at Nimrud, which is rectangular and has orthogonal roadways within it (Novak 2004; Bunnens 1996). The orthogonal planning evident in Neo-Assyrian cities almost certainly has its roots in Mesopotamia. As early as the thirteenth century BC, the Assyrian king Tukulti-Ninurta II built Kar-Tukulti-Ninurta as a rectangular form and included at least two major canals that ran through the city at right angles (Eickhoff 1980: 457). Even earlier examples can be found during the early second millennium BC in southern Mesopotamia, as at the Old Babylonian administrative center of Tell Harmal, ancient Šaduppûm (Baqir 1959). While the relationship among these scattered cases remains speculative, by the early first millennium BC the notion of geometric planning in a new capital city was certainly firmly established in the Neo-Assyrian world, and the importation of such a concept to Zincirli might easily have originated there. Similarly, the rectilinear plan of Tell Halaf in northeastern Syria (Figure 10d; Langenegger *et al.* 1950: plan 1), capital of another small Iron Age kingdom, may also have been borrowed from Neo-Assyrian models.

Despite some similarities to Neo-Assyrian planning, the most salient feature of Zincirli—its circular plan—remains largely without parallel in Assyria, and thus we might look naturally to other circular and/or radial planned cities of the ancient Near East. Perhaps the best known such cities are the so-called *Kranzhügel* settlements of the third millennium BC, found throughout the semi-arid steppe that rings the Syrian desert, from northern Mesopotamia to

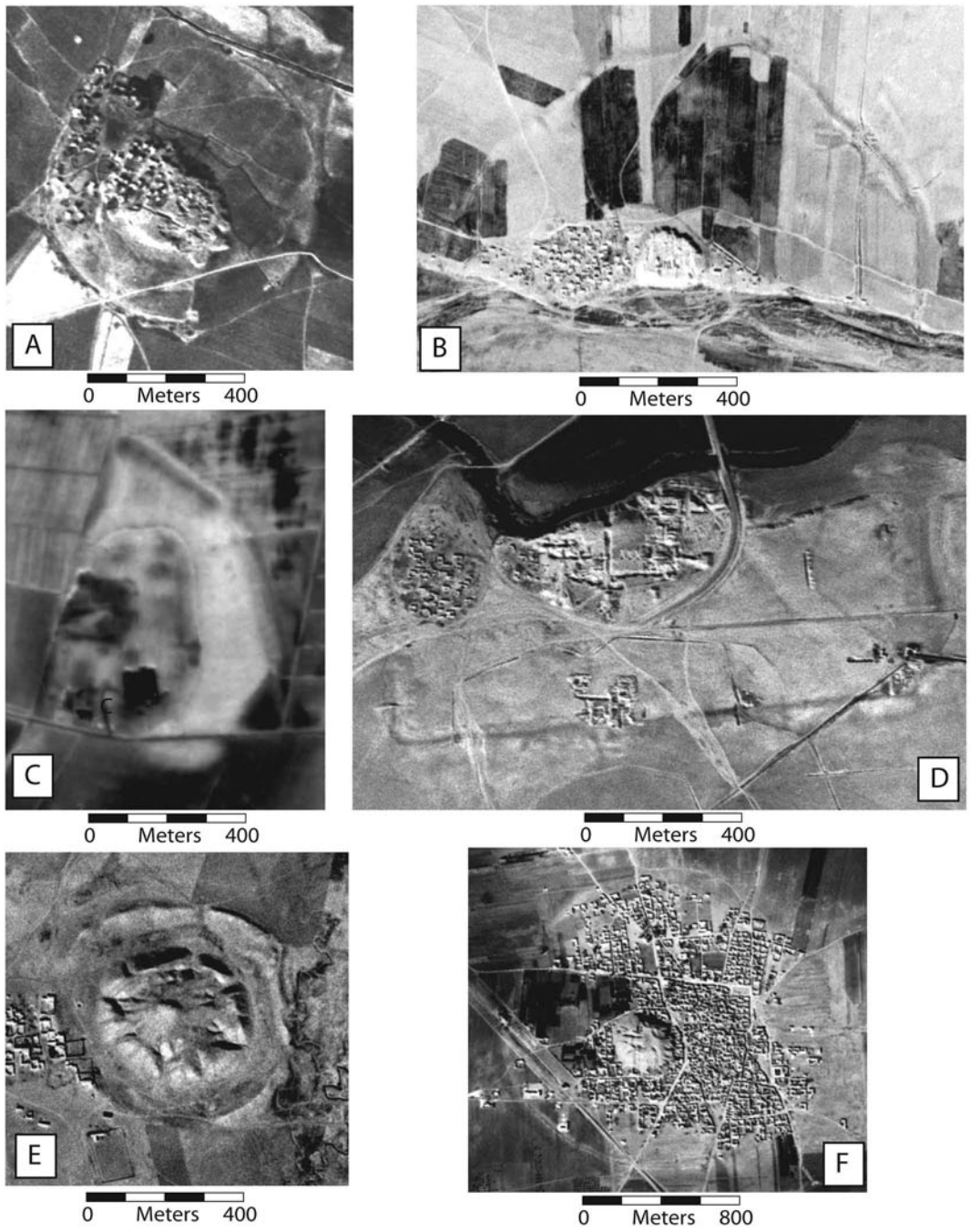

Figure 10. Comparison of declassified CORONA satellite images for new Iron Age captials of Zincirli (a), Tell Ahmar (b), Tell Ta'yinat (c), and Tell Halaf (d), all of which possess a high citadel surrounded by a fortified lower town. Early Bronze Age Kranzhügel-type sites, such as Tell Beydar (e), have a superficial similarity but with very different interior organization than Zincirli. The site of Tell Rifa'at (f), the Iron Age city of Arpad, may be the best parallel to Zincirli, although its lower town has not yet been dated archaeologically. Note that Tell Rifa'at is shown at half scale.

the Levant (Akkermans and Schwartz 2003: 256-59). *Kranzhügel* or 'wreath-mound' settlements are named for their characteristic form, which involves a circular fortification system, usually preserved as an eroded earthen mound, surrounding a low-lying area of settlement, as at Tell Beydar in eastern Syria (Figure 10e). Many of these sites also possess a citadel area at the center of the settlement on which elite residences or monumental tombs were located, making them look, superficially at least, very similar to Zincirli. Several *Kranzhügel*-type settlements, however, have been subjected to geophysical survey, and the resulting data reveal that the interior organization of the sites was radically different than that seen at Zincirli. From Tell el-Rawda, located east of Homs, Syria (Castel and Peltenburg 2007), to Tell Cheura in the Khabur Basin of northern Mesopotamia (Orthmann 1995), *Kranzhügel* sites seem to have been characterized by a radial pattern of streets interspersed by concentric circles, with residential areas neatly packed into pie-slices surrounding a central mound. The regularity in organization of these settlements, so unusual in the ancient Near East, may be the product of the unique cultural and historical moment in which they were settled. These sites generally have a short period of occupation during the mid- to late third millennium BC, and are located in an area that saw very little settlement in subsequent periods (Kouchoukos 1998). They may therefore reflect purposeful planning on the part of the settlers, or they may be the product of other rules governing settlement decision-making that produced this very particular arrangement (Ur *et al.* 2007).

Numerous scholars have speculated on the origin of formalized planning in both orthogonal and circularly planned cities. Oppenheim (1964: 134-35) suggested that Neo-Assyrian cities in particular were modeled on military camps, noting the similarities in the layout of cities to camps as depicted in artworks (Figure 11a; other examples in King 1915). Harmanşah (2005: 270-71) makes a similar claim, suggesting that circular plans have their origin as nomadic pastoral camps. Certainly there are clear parallels between how military camps are depicted and the plan of cities. A well-known example of a circular fort found on a relief panel recovered from Ashurnasirpal's Northwest Palace in Nimrud, dating to around 860 BC, illustrates a circular fort surrounded by a fortification wall interspersed by towers, with various activities going on inside (Figure 11b; Gadd 1936: pl. 29a). The similarity of this representation to Zincirli is striking.

As Bunnens (1996: 120) notes, however, there is no *a priori* reason to assume that cities were modeled on military camps rather than the reverse. Mazzoni (1994: 329-30), in contrast, suggests that circular plans of Middle Bronze Age centers such as Mari on the Euphrates were based on principles of unity and centrality. As discussed above, the differences between the interior organization of Bronze Age circular cities and Zincirli are significant, and thus any formal relationship between the two is likely superficial. The only site to our knowledge that might offer a contemporary parallel is Tell Rifa'at, the Iron Age city of Arpad, one of the major polities in western Syria during the period. The site was briefly excavated in the 1960s, and while the outer city wall was visible at the time (Seton-Williams 1961: 70), it was not mapped by the team and today is obscured by the modern town but is visible in CORONA satellite imagery from the 1960s (Figure 10f). The lower town at Tell Rifa'at is much larger than that of Zincirli, covering more than twice the area, but in other respects is quite similar. Ultimately, our understanding of the relationship of Zincirli's plan to other cities in the region will remain preliminary until future investigations begin to produce data of comparable breadth to that which we have presented here.

Conclusions

Results of geophysical survey at Zincirli provide a robust dataset for investigating the organization

Figure 11. Relief depictions of Neo-Assyrian military camps: (a) an image from the bronze Balawat Gates showing a rectangular, fortified enclosure (upper register); (b) a circular fortified camp from Ashurnasirpal's Northwest Palace at Nimrud, dating to around 860 BC (BM ANE 124548).

of an ancient Near Eastern city. Information regarding the precise location and layout of buildings within the city is of obvious value in planning ongoing excavations at the site and has already led to remarkable discoveries by the Chicago team. Because our data offer one of the only nearly complete urban plans in the region, they also present a unique opportunity to explore the relationship between the production of urban space and the social and historical forces that drove it. The evidence from Zincirli strongly suggests a pattern of distributed authority in creating the built environment of the city, whereby the king and his administrators planned and constructed the circular walls, streets, and citadel, but according to which individual elite households were probably left to plan and build their own residential compounds. The placement of buildings within the city vis-à-vis the roadways further implies that the houses were constructed subsequent to the fortifications and centrally planned features, raising questions regarding the identity of the lower town's residents and their relationship to the king. The fact that the domestic buildings in the lower town are generally quite large, with several approaching the size and mirroring the plan of the palace that was uncovered during the 1890s may indicate that many of the residents were elite members of society. Recent excavations support this conclusion, showing that even moderately sized houses on the periphery of the city were owned and occupied by high officials, as in the case of Kuttamuwa's house. Moreover, there seems to be relatively little spatial differentiation between elite and non-elite neighborhoods within the city. These findings support the notion that the city was organized through a patrimonial household model, a suggestion that will surely be tested through ongoing excavations at the site.

Conclusions reached regarding Zincirli itself have implications for our understanding of Near Eastern urbanism more broadly. The construction of a fortified lower town around an elite citadel at Zincirli fits well within a pattern of new urban foundations across the Near East during the early first millennium BC. These new centers, from the Neo-Assyrian cities in northern Mesopotamia to the Aramaean and Neo-Hittite polities of the Levant and Anatolia, have sometimes been regarded as disembedded capitals. It is possible that Zincirli offers a model for the organization of urban space at these other cities. However, unlike many other contemporary new

capitals in the Syro-Anatolian region, Zincirli's fortifications and roadways adhere to a strict geometric plan, a feature more commonly attested at Neo-Assyrian cities to the east. Moreover, the circular plan of the city has few contemporary parallels, as its interior plan is strikingly different from the circular *Kranzhügel*-type sites of preceding millennia. Thus Zincirli may be more anomalous than representative of Aramaean and Neo-Hittite urban planning, an issue that must await further analysis at other sites.

Future research may show the relationship of Zincirli to other contemporary new capitals and may also indicate how traditions of urban planning developed during the early first millennium BC might have informed the design of later cities such as Neo-Babylonian Babylon (Van de Mieroop 2003), Achaemenid Parsagadae and Susa (Boucharlat 2001) and those of the Hellenistic and Roman period (Ball 2001). However these specific questions are ultimately resolved, our results clearly demonstrate the potential for studies of ancient cities that employ methods aimed at documenting the organization of built environments over large areas and that explore their unique spatiality by reference to local historical and cultural factors.

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