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Site size hierarchy in middle-range societies

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ABSTRACT

Site size hierarchy is an archaeological pattern commonly used to identify regional political hierarchy in state-level and stateless middle-range societies. Although a number of archaeologists have acknowledged that several processes can produce site size hierarchy, many scholars in North America and Eurasia continue to assume that this settlement pattern is solely generated by single process—hierarchical, politically centralized societies. This assumption, I believe, limits our ability to build an accurate database of societies with emergent inequality. In this paper, I review the processes potentially responsible for producing site size hierarchy, and draw on ethnohistoric case studies from the Great Lakes region and Papua New Guinea to illustrate these processes. I then assess the possible mechanisms that created site size hierarchy for a prehistoric case in Middle Bronze Age Hungary (1750–1400 BC)—an area where the signature is almost universally assumed to index regional political hierarchy. However, I reveal that the Hungarian case study instead points to several other processes—including aggregation, dispersal and community fission—that lie behind this pattern. These examples suggest that site size hierarchies, when interpreted uncritically as social hierarchies, may overestimate the degree of political centralization in prehistoric societies.

1. Introduction

Site size hierarchy is a settlement pattern composed of a large number of small sites and a small number of large sites. Identifying regional political hierarchy by the presence of site size hierarchy is a common practice in archaeology. The practice of using site size to identify hierarchical, politically centralized societies began in North America in the 1950s and 1960s, where ball courts and mounds in the Americas were also used to distinguish central places from normal villages and hamlets (Beardsley et al., 1956; Blanton, 1972; Parsons, 1971). Over the years, however, site size hierarchy—in the absence of monumental architecture—has often come to be used as an indication of regional political hierarchy (Creamer and Haas, 1985; Earle, 1987; Gilman, 1981; Johnson, 1973, 1977, 1978; Liu, 1996; Kristiansen and Larsson, 2005:125, 158; Milisauskas and Kruk, 1984; Németi and Molnár, 2002, 2012; Peregrine, 2004:285). Site size hierarchies likely represent political centralization in many cases, but I argue in this paper that several other processes also generate this pattern. Consequently, using site size hierarchies uncritically to infer social hierarchies overestimates the political centralization in the archaeological record.

In this paper, I investigate how different mechanisms produce hierarchical site size distributions in settlement systems and settlement patterns. By *settlement system* I mean the set of rules that generates the *settlement pattern*, which is defined as the distribution of sites on the regional landscape that is empirically derived by sampling or survey (Flannery, 1976b:162). Many scholars of regional settlement patterns have moved beyond the assumption that site size hierarchies are the product of hierarchical, political centralized societies, and have explored other causes (e.g. Banning, 2002; Crumley, 1979; Gregory, 1991; Harry, 2003; Kantner and Kintigh, 2006; Keswani, 1996; Kohler, 2004; McIntosh, 2005; Parkinson, 2002; Peterson and Drennan, 2012). Flannery clearly outlined many alternative mechanisms as early as *The Early Mesoamerican Village* (Flannery, 1976e). These data are worth revisiting, because there is an increasing need for regional interpretive frameworks in areas like prehistoric Eastern Europe, where pedestrian survey, aerial survey, and excavation are greatly increasing the identification of sites (Braasch, 2002; Dianchenko and Menotti, 2012; Galaty, 2005; Gojda, 1993; Jankovich et al., 1998; Kowalewski, 2008; Viedeiko, 2012).

I begin with a review of how settlement hierarchy and regional political hierarchy became strongly associated, before discussing other determinants that can produce site size hierarchies. I then outline the impact of these processes on the archaeological settlement patterns of the Mohawk Valley Iroquois and Illahita Arapesh of Papua New Guinea—two societies with hierarchical site sizes, but known ethnohistorically to have lacked regional political hierarchy. Finally, I reinterpret an archaeological settlement pattern

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from eastern Hungary during the Middle Bronze Age (1750–1400 BC) in light of the Iroquois and Arapesh cases and the five alternative processes that shape site size hierarchy.

2. Historical background

Site size hierarchy is not universally assumed to indicate regional political hierarchy, but in this section, I review some of the historical forces that shaped this belief. Two assumptions underlie the link between site size hierarchies and regional political hierarchies: functional specialization at capitals and regional tributary integration. The first assumption can be traced to the earlier twentieth century, when Christaller (1966 [1933]) described large centers in Southern Germany as economically specialized, providing a wider range of goods and services than smaller settlements. Christaller argued that functional specialization emerged due to the costs of moving goods and the lower demand of services in rural areas. This, he argued, resulted in a logical and patterned spatial hierarchy of settlements. By the early 1960s, geographers had observed that larger settlements in market societies outside of Germany also provided more goods and services and performed more functions than smaller settlements (Haggett, 1965:115–118). The tiers of settlement hierarchy could therefore be understood as central places of diminishing functional ranges as their size classes generally went from large to small.

Data from ethnographic and archaeological evidence—primarily from near-state societies or complex chiefdoms—led to the expansion of this model to different site size classes in stateless societies. In the Near East, settlement size became a proxy for the degree of functional specialization when American archaeologists wed Christaller's central place theory (via the New Geography) to settlement data from regional surveys used to study early states (Wright and Johnson, 1975). Wright and Johnson (1975) considered decision-making and the coordination of activities to be a key functional specialization in archaic states. They argued that they could pinpoint levels of functional specialization (decision-making) in settlement frequency histograms by site size. The modes in settlement frequency distributions for the Susiana Plain could therefore stand as proxies for functionally specialized administrative tiers. In the absence of systematic survey data, site type (in the British tradition) served a similar role (e.g. Clarke, 1972). Large fortified settlements were considered the higher tier in a region, where the majority of known settlements were small, unfortified hamlets.

Johnson (1973) also identified particular settlement patterns associated with stages of political complexity. He used Service's (1962) band-tribe-chiefdom-state social typology to argue that at least three levels of decision-making hierarchy underlie a state, two levels possibly underlie chiefdoms (a paramount at a central site and petty chiefs at subordinate villages), and one level is characteristic of a tribe. Taylor's (1975) analysis of African ethnographies evaluated this hypothesis, and found some support from early twentieth century settlement patterns (Fig. 1). In the example of the Lovedu of South Africa, for example, the Rain Queen and her retinue, lived at the largest settlement and received yearly tribute in food staples and beer from residents at smaller settlements (Krige, 1941; Krige and Krige, 1943).

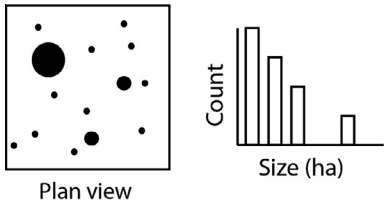

Fig. 1. Schematic plan view (left) and frequency distribution of site sizes for Lovedu settlement patterns.

The second assumption underlying the idea that settlement size hierarchies equate to regional political hierarchies was established at the end of the 1970s. It holds that the relationships between centers and sites in the hinterland are asymmetrical, with central sites receiving tribute payments from outlying settlements. A widespread interest in chiefdoms in the 1970s saw archaeologists focused on identifying their footprint on the ground. Diverse settlement sizes were linked to intra-regional political inequality; large tending toward wealthy political centers, and smaller tending toward economic and political dependents. In Renfrew's (1974) analysis, central places served as the ritual centers for both individualizing and group-oriented chiefdoms. Both were considered to have achieved a strong degree of regional consolidation and organic solidarity by redistributing goods or services between different settlements in a region at the central place. Even when central place theory was abandoned in favor of dominance models (i.e., the XTENT model), the assumption of a center's control over its territory remained (Renfrew and Level, 1979).

Other influential papers on chiefdoms in the late 1970s provided a road map for identifying regional political hierarchy and interpreting site size hierarchy in middle range societies (Earle, 1977; Peebles and Kus, 1977; Steponaitis, 1978). Central place theory, site size hierarchy, and the archaeology of stateless societies were used together to stress the coercive, tributary aspects of societies with site size hierarchies. The spatial layout of regionally consolidated political groups was observed to evolve in response to external constraints and internal tributary requirements, positioning second tier settlements between capitals and hamlets to facilitate tribute collection (Steponaitis, 1978). Site size hierarchy, or central places, became proxies for tributary chiefdoms and stratified societies (Creamer and Haas, 1985; Earle, 1987, 1991, 2002; Earle and Kolb, 2010: 71–76; Gilman, 1981; Milisauskas and Kruk, 1984; Peregrine, 2004:285).

Not all those working on middle-range societies continue to assume that site size hierarchy, or central places, represent politically integrated hierarchical societies (for a through discussion, see a review of recent settlement pattern research in Kowalewski, 2008). For example, in a comparison of 11 regional trajectories based on histograms of population size, Peterson and Drennan (2012) distinguish changes in aggregation patterns from labor mobilization in corresponding public works and tax rates. Their comparison reveals that the Hohokam—a prehistoric society rarely described as strongly hierarchical—had one of the highest tax rates and strongest regional demographic surges (Peterson and Drennan, 2012: 128). Such a finding is only possible once social dimensions, or data threads, have been isolated to allow correspondences to be studied empirically (Drennan and Peterson, 2008, 2012; Duffy, 2014: 45–66; O'Shea and Barker, 1996; Upham, 1990).

Recent discussion of site size analysis also emphasizes the lower limits of certain methods for studying regional integration (Drennan and Peterson, 2004, 2008). Drennan and Peterson (2004) developed techniques for comparing differences in centralization by using rank-size graphs, an analysis that can be useful for social systems with well-defined capitals, and secondary centers or administrative tiers. However, when dealing with societies with less well-defined political hierarchy (where rank size graphs are already demonstrably convex), alternatives need to be used for meaningful analysis. To this end, Drennan and Peterson's (2008) approach to smaller scale regional communities used an alternative centralization metric, measuring the deviation of site size hierarchies from an expected unimodal Poisson distribution. They are careful to note that sociopolitical integration and demographic centralization are not the same thing (Drennan and Peterson, 2008: 364).