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## Network Theory and the Archaeology of Modern History

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### Introduction

In my book *A Historical Archaeology of the Modern World* (1996), I outlined a general approach intended to help forge a truly global historical archaeology. The gist of my argument was that after about A.D. 1500, conscious agents of colonialism, capitalism, Eurocentrism, and modernity created a series of complex, multidimensional links that served to tie together diverse peoples around the globe. My arguments were, in essence, that it was the interaction of these diverse peoples that created the many historical manifestations of the modern world, the world which we in fact now inhabit. Central to my argument was the idea that men and women, in the course of their daily lives, create and maintain the connections that precipitate both cultural change and cultural continuity over time.

I argued then that historical archaeology, to have a truly significant place in today's scholarship, should embrace the issue of global connections, providing empirical studies demonstrating the origin and earliest development of globalization, modernization, and colonialist expansion. I still believe in the essential validity of my general research program (Orser, 1998c), but having outlined the general approach, it is now appropriate to devise a concrete framework for conducting archaeological studies of the sort I advocate. Among the many approaches that might

be selected or devised, I believe that my research goals can best be accomplished by adopting an approach that is overtly rooted in network analysis adapted both from contemporary anthropology and sociology, and from geography. The purpose of this paper is to present an outline of this approach and to argue for its strength and interpretive potential. I believe that the use of such an approach will permit historical archaeologists to collect, evaluate, and interpret information in new and informative ways. As part of this argument, I also present a brief example from Brazil, focused on the seventeenth-century slave kingdom of Palmares.

## A Central Tenet and Its Implications

A central proposition of the kind of analysis I propose rests on the understanding that men and women hold themselves together socially through a series of complex interrelationships that can be modeled as a web. This understanding of human society has a long pedigree in anthropological thought. For instance, early in the twentieth century, French sociologist Emile Durkheim (1915: 426) argued that social units, often identified by analysts as tightly bounded, discrete entities, were in fact broad and far-reaching. As he put it, "There is no people and no state which is not part of another society, more or less unlimited, which embraces all the peoples and all the states with which it first comes in contact, either directly or indirectly". The theme of social interconnectedness was later adopted by British anthropologist A. R. Radcliffe-Brown (1940) and American anthropologist Alexander Lesser (1961). Both scholars took Durkheim's idea further, focusing on the notion of the social network. Radcliffe-Brown (1940: 3) wrote that every individual was part of "a wide network of social relations, involving many other persons", and Lesser (1961: 42) argued that human groups were "inextricably involved with other aggregates, near and far, in weblike, netlike connections." During this period, other social scientists adopted the concept of the social web to develop an explicit "social network analysis." In anthropology, J. A. Barnes (1954) and J. C. Mitchell (1974) were early leaders in developing this approach, and today a full-blown field of social network analysis exists in anthropology and sociology (Wasserman and Faust, 1994). Most recently, anthropologist Michael Carrithers (1992: 11) has used the term 'mutualism' to refer to the idea that social relationships are "the basic stuff of human life".

Following on the heels of Barne's (1954) pioneering study of the social networks created and enacted in a tiny Norwegian fishing village, a number of researchers refined and broadened the idea of the social network by attempting to discover how networks operate, how they are constructed, and how men and women—and social collectives—produce and reproduce the links between them. Further research has shown, for example, that connections can include a wide variety of factors, including kinship, class loyalties and perception, environmental

understandings, economic strategies, relations of power, and cognitive understandings (Knocke and Kuklinski, 1982: 15; Schweizer, 1997; Wolf, 1982, 1984).

One of the implications of adopting a network perspective is that it allows investigators to downplay the mysterious effects of culture. In the purely “culturalist” point of view, individuals do things because of their culture. Culture appears to float above them as an ethereal cloud, invisible yet present, inescapably exerting itself on everything people do. The culturalist perspective helps to explain, for example, how colonizers could move from one part of the world to another and create an image of their homeland in a different environment.

Culturalist explanations have been particularly prevalent in archaeology, especially in historical archaeology. Archaeologists studying post-Columbian colonialism have been drawn to the culturalist position because of its apparent ability to explain the transference of culture from one place to another. Accordingly, James Deetz, an accepted leader in the field, has given this perspective a prominent place in the historical archaeologist’s interpretive toolkit. Thus, for him, a “cultural landscape” is “that part of the terrain which is modified according to a set of cultural plans” (Deetz, 1990: 2). Within this understanding, human-built landscapes look the way they do ‘because of culture’. People shape their physical landscapes in accordance with what makes them comfortable. In colonial situations, then, the transference of culture from one part of the world to another has meant, quite literally, that “At the southern tip of the African continent, one finds a little piece of England” (Deetz, 1990: 1). Given that men and women who traveled the globe took their cultures with them, it only makes sense that they would construct environments that fit their cognitive models of what is proper and right. Thus, the culturalist view neatly explains why structures in one part of the world can look just like those in another. Fort Orange in New York State resembles Forte Orange (Forteleza de Santa Cruz de Ttamaracã) in northeast Brazil because the colonial Dutch built both fortifications. The forts’ engineers and builders obviously raised structures that made sense to their cultural understanding of the proper appearance of a fortified place. Another way to say this is that the builders of the forts, *in effect*, lived under their culture’s all-pervasive cloud, a fact that the physical things they constructed appears to reflect extremely well.

The culturalist’s conception of the cultural landscape seems to make abundant sense, and many historical archaeologists have used this model in their research (see, for example, the papers in Kelso and Most, 1990, and Yamin and Metheny, 1996). Many archaeologists, trained in the anthropological tradition, find comfort in using culture as the final explanation for understanding the way the world works. The built environment, like everything else, reflects culture. This conclusion is perhaps in some measure adequate, but is it enough? Even Deetz (1991: 8) said that historical archaeology will often refute Occam’s Razor, meaning, of course, that the simplest explanation may not always be the best. Such is the case with the culturalist explanation.

The culturalist position has indeed found a ready audience among many historical archaeologists, but it contains two significant problems that cannot be ignored. In the first place, the position incorporates a vague notion of culture and gives it explanatory power. Most archaeologists are indeed careful, exacting scholars, but the culturalist position makes it too easy to end an investigation with a simple culturalist 'explanation': "Their culture made them do it".

In other words, the culturalist point of view promotes facile explanations and interpretations to explain otherwise exceedingly complex historical situations. The presentation of simplistic interpretations does no service to the archaeological profession, especially at a time when archaeological budgets are in danger of being reduced or disappearing altogether. The second deficiency with the culturalist perspective is that it tends to downgrade, or even to hide, mutable, historical social relations and to create in their wake seemingly synchronic pictures of the past. Thus, the culturalist may envision a built landscape to represent a cultural imprint that in fact lasts for many years as if frozen in time. Accordingly, when the utopian Harmony Society created their "cultural landscape" at Economy, Pennsylvania, it "symbolized the German homeland from which they were forced to flee" (De Cunzo et al., 1996: 111). While no archaeologist, regardless of interest, is unmindful of diachronic change, the culturalist perspective makes it possible, and indeed easy, to accept some degree of synchronicity. Germans create a timeless little Germany in Pennsylvania, while the English recreate a little England in South Africa. This statement is true to some extent, but overall culture change is difficult to model within a landscape when the entire landscape is viewed as culture's creation.

A network approach openly rejects the culturalist position and proposes instead that landscapes are conscious creations based, not strictly on culture, but on the interactions and associations of male and female agents. An individual's associations and connections are conscious creations that are free to change situationally. In thinking of a physical place, rather than to perceive a cultural landscape—a space created through the vagaries of culture—the network approach understands that physical creations require an intimate knowledge of time and place, built around two interconnected dimensions, the sociohistorical and the socioenvironmental structures. These structures are composed of human-to-human and human-to-environment relations. If we wish, we may refer to the structures as cultural, but only in a nominal manner; the use of 'culture' in this instance has no final explanatory power.

## Networks in Archaeology's Past

Interest in the past use of space is not new in archaeology. Beginning with Willey's (1953) pioneering settlement studies in Peru, archaeologists have considered and evaluated where ancient peoples have built their

sites and monuments, and many archaeologists have conducted spatial, or locational, analyses in the attempt to explain ancient site distributions (for some examples, see Clarke 1977a; Hodder and Orton 1976; Kent 1984; Zimmerman 1977). It has emerged from these studies, and from those of scholars in other fields, that the notion that where things are not is as important as where things are. Though archaeologists of necessity focus their excavations on the discrete locations where past activities have occurred—where things are—they also understand the significance of where things are not. A classic example can be found in the prehistoric Hopewell Interaction Sphere, a model proposing that prehistoric Native Americans in the midwestern United States (from about 100 B. C. to A. D. 300–350) carried on economic activities within a series of expanding networks. The operating networks included intra-local, inter-local, intra-regional, inter-regional, and even trans-regional manifestations, eventually tying together sites hundreds of kilometers apart (Struever, 1964; Struever and Houart, 1972). This model was created to account for the presence of similar artifacts found great distances from one another, but its creators had an intuitive understanding that the objects moved through space in order to be deposited where they were found. In other words, in order to reach their final resting places, the artifacts had to have occupied a series of different spots along the route.

The need for archaeologists to understand the interconnection between space and place was explicitly noted several years ago by David Clarke (1977b), who described what he termed ‘spatial archaeology’. As he defined it, spatial archaeology is:

... the retrieval of information from archaeological spatial relationships and the study of the spatial consequences of former hominid activity patterns *within and between* features and structures and their articulation within sites, site systems and their environments: the study of the flow and integration of activities *within and between* structures and resource spaces from the micro to the semi-micro and macro scales of aggregation. (Clarke, 1977: 9; emphasis added)

Clarke’s somewhat dated use of the totalizing structures of micro (within structures), semi-micro (within sites), and macro (between sites) levels can be excused, but his basic understanding is generally consistent with the network approach I advocate. Clarke explicitly understood the difference between ‘spatial archaeology’—as a pursuit intended to understand the significance of places and spaces—and ‘settlement archaeology’—an archaeology directed toward living places. An archaeology directed toward understanding the networks of the past has several similarities with Clarke’s spatial archaeology, with the exception being that my approach leans much more heavily on social network theory, a topic not as well formulated twenty years ago as it is today. Though Clarke did not make detailed use of network theory, even as it was then formulated (Haggett and Chorley, 1969), he nonetheless did have an avowed interest in understanding networks in archaeological research (Clarke, 1968: 469–472).

Examples showing the importance of social networks in historical archaeological analysis are not prevalent, but they do exist (Orser, 1998b). Two studies deriving from recent research at Annapolis, Maryland, are illustrative (Shackel et al., 1998). In the first example, Mark Warner (1998) investigates two houses inhabited by African-American families in the late nineteenth and early twentieth centuries. Examining social status and its identification with artifacts is a persistently important topic in historical archaeology. Warner observes that the African-American community did not represent a monolithic culture. On the contrary, the residents of the community appeared to make conscious choices that were socially charged and situationally meaningful. Individuals took certain actions within their community, not because their culture directed them to do so, but because some situational opportunity had presented itself at the time. Warner uses the consumption of tea as an illustration to show that some African Americans consciously selected tea drinking as a strategy to produce direct social benefits. Men and women drank tea, not because tea drinking was some kind of cultural marker, but because its consumption fostered and maintained certain relationships that the consumers deemed helpful to their specific situations. Tea, in essence, helped to create and maintain certain sought-after social connections. In historic Annapolis, then, there existed distinct networks of tea drinkers. One implication of this finding is that the presence of tea cups and saucers at sites associated with African Americans serves to indicate a possible social strategy of real living men and women, rather than the operation of some cultural norm. In another study, Christopher Matthews (1998) shows that the most important architectural designs of Annapolis's elites were those inspired by Andrea Palladio. Matthews argues that because Palladio was an extremely significant creator of the built environment within this prominent Chesapeake city, we must understand the man himself before we can begin to understand his style of architecture. As part of this understanding, we should recognize that Palladio and other prominent architects designed buildings that were idiosyncratic to a certain extent. Though we may suppose that the buildings were idiosyncratic in somewhat culturally constrained ways, it is difficult to argue that the architects produced buildings simply as products of their culture. Palladian architecture is clearly European in form, but is the use of the culturalist's perspective here, as an explanatory tool, truly satisfying? On the contrary, it seems much more interesting and potentially more enlightening to argue that the buildings designed by architectural luminaries were intended to symbolize, create, and maintain social relations between people, and to create boundaries between individuals (see also Leone, 1995; Leone, et al. 1998). As large objects seeking to communicate profound messages, the buildings and the creators behind them were integral elements of social networks. They worked to create social and physical distance between real men and women. In both examples, then, a culturalist interpretation would fall short of providing satisfactory explanations and promoting historical understanding. I believe that much more interesting and powerful interpretations will result from adopting an explicit network perspective.

Clearly, to make network theory useful to archaeological interpretation, archaeologists must devise frameworks that have direct archaeological relevance. Whereas earlier attempts by prehistorians to adopt network approaches in their research have drawn largely from geographic models, the use of written records and oral testimony by historical archaeologists makes it possible to apply some of the approaches from social network theory to studies of post-Columbian history.

The relations put into operation in a sociohistorical setting—encompassing both human-to-human relations and human-to-environment relations—comprise networks. Networks are easy to conceptualize as graphs composed of points connected by lines. In formal network analysis, points are termed ‘nodes’ or ‘vertices’, and connecting lines are termed ‘links’ or ‘edges’ (Haggett and Chorley, 1969: 5; Wasserman and Faust, 1994: 93). The archaeologist’s job is to discover the nature and composition of these relations, to learn how they were expressed in material terms, and to understand these expressions through time. The archaeologist’s first task is to develop a conceptual understanding of both kinds of relations, acknowledging the significance of their historical manifestations and accepting that a framework created for one sociohistorical setting will not have universal application.

For archaeological analysis, it is important to remember that human-to-human relations, like human-to-environment relations, are social and spatial at the same time. It is also necessary to understand that many of the relations that archaeologist study will incorporate power in some fashion. This understanding is particularly pertinent for historical archaeologists because the societies they study are usually capitalist in nature or at least have some involvement (willing or unwilling) with the capitalist enterprise.

Capitalist relations necessarily incorporate issues of power. Though it may be easier to conceptualize the enactment of power relations between individuals, we may also observe from our vantage point in the late twentieth century, in view of the destruction of diverse biotic communities during the modern era, that power is also exerted by humans on plant and animal communities (Mander, 1996). Thus, in both human-to-human and human-to-environment relations, we may accept Foucault’s statement that “space is fundamental in any exercise of power” (Rabinow, 1984: 252). Where there is space, particularly in a capitalist setting, there is also power. And, the conduct of capitalism is necessarily a spatial pursuit as well as a social and economic endeavor (Scott, 1998; Sheppard and Barnes, 1990).

The introduction of relations of power necessarily raises the issue of ideology. Ideology has been, and most likely will continue to be, a hotly debated topic by scholars, including archaeologists. In this paper, it is not my intention to provide a lengthy discussion of ideology, and for present purposes it is enough to use the classic understanding that ideology serves to misrepresent and to hide social relations between

diverse men and women, either individually or collectively. Rather than constituting an immutable force exerted by one class on another, the most sophisticated analysts imagine that ideologies are constantly being redefined both historically and situationally by real historical actors. Most scholars also now accept that ideologies are not created solely by society's elites, preferring instead to argue that every social unit is free to construct and promote its own ideologies. Given this reality, it is pertinent to consider the characteristics and consequences of the clash of ideologies within a society. For historical archaeologists, this clash usually occurs within a capitalist society or in situations where capitalism is being introduced and actively promoted, accepted, and resisted (Orser, 1996: 160–178). Thus, understanding the clash of historically constructed ideologies in capitalist settings necessarily incorporates some knowledge of how power relations are created, enacted, and maintained within complex webs of interaction.

Social relations, power relations, and the construction of ideologies are important archaeological topics because each always occurs at a particular place and at a certain historical time. And, given the nature of archaeological research, the historical manifestations of these relations can be evaluated over time. But before we can make such diachronic studies, we must have a method and a terminology for understanding the synchronic characteristics of the networks themselves. These modeled networks must be firmly rooted in the social and historical realities of the situation under investigation.

As a start, we may say that the locations where social connections are given expression are 'places' while the distance between the places are 'spaces'. In network language, places are nodes or vertices, while spaces are links or edges. Places and spaces can be either actual, physical entities—courtyards, houses, roads—or they can be cognitive structures—kinship ties, associational, memberships, and so forth. In both cases, the humanly constructed places and spaces represent 'spatiality,' a consciously created sociophysical landscape. Spatiality is thus not a naturally occurring phenomenon, simply a place where a culture lives. Rather, it is a "constituted objectivity, a 'lived' reality" (Soja, 1989: 79). Spatiality is ultimately "about the ordering of relations between people" in space and place (Hillier and Hanson, 1984: 2).

Spatiality can be the expression of ideology imprinted on the earth's surface to show that humans "are not so much self-aware as self-and-other aware" (Carrithers, 1992: 60). What this means is that the construction of modern landscapes is a function of the network of relations people maintained both with one another and with the natural environment around them. In constructing their landscapes, men and women are not simply agents of their culture, they are self-and-other aware. Men and women create social and environmental relations within a complex series of interconnected networks, each of which has specific historical meaning. Therefore, added to the idea that ancient roads and transportation routes were "ties that bind" (Hassig, 1991), we may also say that the social connections represented by the roads also bound men and women together. The social ties and the physical links work in tandem.



Scholars from several disciplines have conducted network analysis for many years, but archaeologists in large measure have been reluctant to follow suit. Though many reasons may exist for this lack of application—some of which may be purely personal—at least two reasons immediately spring to mind to explain the archaeologists' general disinterest in network analysis.

In the first place, archaeologists who study prehistory are usually reluctant, often for good reason, to adopt research methods and approaches originally designed to interpret modern settings. Many archaeologists may consider the often great time lengths between the subject of their study and the subject of the model weakens the model's applicability. For example, some archaeologists may be reluctant to use information on the rail systems on nineteenth-century New England in their study of the road system of the ancient American Southwest. Establishing the relevance of the analogy in this case could be extremely difficult. Prehistorians, of course, are well aware of the problem here, and this understanding is probably what lead Clarke (1977b: 28) to argue that "archaeology must develop its own related range of spatial theory" that could articulate with other disciplines examining the use of space.

The second reason why archaeologists may have largely rejected network analysis in their research may stem from the practical considerations of data collection. Simply put, the collection of adequate information is often unrealistic or even impossible when large-scale networks are the intended focus of study (Gorenflo and Bell, 1991: 80). Archaeologists, often facing severe shortages of time and funding, usually do not have the luxury of collecting data from large regions. The collection of information from a large area may take years of research. As an example, Struever's study of the Hopewell Interaction Sphere noted above was only possible after at least two decades of serious archaeological work had preceded him. Archaeologists have always confronted the problems of inadequate data collection, and the problem is acute for network analysis, even when conducted by cultural anthropologists (Sanjek, 1996: 397). The problem only grows more acute when archaeologists begin to think in trans-regional or global terms. Geographer Peter Haggett (1990: 28) nicely summarized the problem when he observed that the "problem posed by any subject which aims to be global is simple and immediate: the earth's surface is so staggeringly large."

The concerns of archaeologists over the collection of adequate information and the application of appropriate models are clearly important to consider. But, though these concerns justifiably trouble prehistorians, they need not be of equal worry to historical archaeologists. The presence of written records and other sources of textual and even oral information makes network analysis considerably more appealing to historical archaeologists. The presence of textual documentation, which may include maps, plats, plans, and written and verbal descriptions,

may even decrease the need to conduct large-scale reconnaissance surveys. Every historical archaeologist knows that written records must not be used uncritically, even where physical features are concerned (Milanich, 1998), but most would agree that such materials can be excellent sources of information. In fact, the presence of textual information has often been used as a defining characteristic of historical archaeology. One of the great advantages of using textual and verbal information in historical archaeology is that, where researchers have used them to construct settlement models, they often provide a one-to-one correlation between the model and the archaeological entity under study. Even in cases where direct association does not occur, justifiable confidence in the applicability of the model is often possible because of the similarity in time between the model and the unit of study. Thus, a geographic model of nineteenth-century settlement in Maine, based on written records and field survey, may be applicable to an archaeological study of nineteenth-century settlement in Massachusetts.

Without question, the advantages offered by the presence of textual information give network analysis in historical archaeology great potential. Documents, carefully considered and evaluated, can increase the validity and power of an archaeologist's spatial interpretations. Beyond this simple practical concern, however, network analysis in historical archaeology is even more significant because it can provide empirical grounding to issues that interest many anthropologists and archaeologists today: "layered contexts, multiple voices, and historical processes" (Houseman, 1997: 753). In this sense, the application of network analysis to archaeology, and particularly to historical archaeology, is timely and pertinent.

Network analysis begins with the simple notion, stated above, that men and women create and maintain relationships. Networks of interaction or association exist because individuals have many relationships. These relationships can take the form of 'vertical' and 'horizontal' linkages (Schweizer, 1997: 740). Vertical linkages are those that are hierarchical, and which relate to social units of increasingly larger size. Horizontal linkages, on the other hand, relate to the interconnectedness between various domains within a social unit.

Both horizontal and vertical links are important to consider, but an interest in hierarchical links is especially pertinent to historical archaeology because vertical linkages tie men and women to interregional, extraregional, and even transnational networks of the kind that operated after 1492 (and which still operate). Given the nature of these links, historical archaeologists must adopt a multiscalar approach to study them (Orser, 1996: 184–190). A multiscalar perspective is also needed to examine the horizontal linkages because these connections tie together the political, economic, social, communicative, and other elements of a social body.

A network model and multiscalar analysis go hand in hand. In the course of their daily lives, men and women conduct their actions along a number of different scales and within a diverse number of networks. Out of the infinite number of scales that can exist in any social entity,

individuals “comprehend patterns, recognize homogeneity, plan for the future, and operate in the present at specific scales” (Marquardt, 1992: 107; see also Marquardt, 1985). An ‘effective scale,’ the level at which a pattern or meaning may be discerned, exists for each conscious decision made by the individual (Crumley, 1979: 166).

When conducting an overt multiscale analysis, a researcher begins at one effective scale and seeks to understand it. Once the analysis is satisfactorily completed, the knowledge is transcended as the analyst moves to another scale. This process is repeated until the investigator is satisfied that all possibilities have been exhausted. As one moves from one scale to another, it often becomes clear that the social entities under investigation maintain their connections across time and space. Historical archaeologists examining the modern world should understand that the agents of colonialism, capitalism, globalization, and Eurocentrism created links that cross-cut several effective scales, both social and physical.

Network analysis gives initial prominence to people and places as nodes and the links that connect them. The resultant network analyses, which clearly must be multiscale, can be used to model relationships between people and people, people and places, and places and places in both synchronic and diachronic dimensions.

Several key concepts lie at the heart of formal network analysis. In social network analysis, these concepts are, in ascending order: actor, relational tie, dyad, triad, subgroup, group, relation, and social network (Wasserman and Faust, 1994: 17–20). In an archaeological analysis modeled on social network analysis, the analytical concepts might be site, connector, dyad, triad, area, region, relation, and network (Table 6.1).

In social network analysis, the actors are discrete individuals or social units that work collectively. Depending upon the scale of analysis, the individuals can be single men and women in a group or nation-states within a world network. For archaeological analysis, however, it may be most appropriate to consider the actors to be individual men and women since this conception would be consistent with the geographic notion of the site. Though it may be difficult or impossible to conduct research on individual men and women in prehistoric settings, this focus need not cause overwhelming concern for historical archaeology

Table 6.1. Core Concepts of Network Analysis

Social	Archaeological
actor	site
relational tie	connector
dyad	dyad
triad	triad
subgroup	area
group	region
relation	relation
social network	physical network

because of the presence of supportive, non-archaeological documentation.

Actors are linked together by relational ties. These social connections can be rooted in personal evaluations (such as friendship, respect, a sense of empathy), an association or affiliation (through shared labor, organizational membership), kinship (either real or fictive), or through a power relationship (owner to worker, ruler to ruled). In a geographic sense, the relational ties will be actual physical features that serve to link sites together, such as rivers, roads, causeways, and bridges. The importance of such features in archaeological analysis is “that they can provide tangible evidence of cultural links across geographical space” (Trombold, 1991: 8); they are, in essence, connectors. A dyad, in both social and physical space, refers to the relationship established between two actors or sites. In network analysis, the tie between the two entities is perceived as an integral property of the pair rather than as a feature of either individual (Wasserman and Faust, 1994: 18). Thus, the tie between father and son is a property of both individuals at the same time, just as a road linking two sites originates from both at the same time. In social analysis, it is possible, however, to have “asymmetric dyads” (Wasserman and Faust, 1994: 510–511), where a relationship is only chosen by one of the individuals. As an example, a son who feels abandoned may reject a relationship promoted by his father. Asymmetric dyads may also appear in the landscape, though probably with less frequency. A swiftly running river, connecting two villages, provides an example. In the absence of motor boats, only the villagers living upriver could use the river as a relational tie. The villagers living downstream would have to use another relational tie (a road or path) if they sought interaction with the upriver villagers. The triad, like the dyad, has been the subject of much network analysis. It consists, as the name implies, of three actors, or thinking archaeologically, of three interconnected sites. Following this line of reasoning, a subgroup in social network analysis is comprised of sets of dyads and triads. For archaeological analysis, I have chosen to term the subgroup an ‘area,’ and the group—composed of several subgroups—a ‘region.’ This usage is consistent with the notion of the region in geographic network analysis as being an area enclosed by relational links or edges (Haggett and Chorley, 1969: 5).

Elsewhere (Orser, 1996: 131–144), I have explored the problem posed by physical boundaries when using a network approach in archaeology. To paraphrase, I argued that when archaeologists explicitly think about the relational ties between sites and people they may be forced to forget their traditional understanding of what constitutes an archaeological area or region. In line with the proposition that site dyads and triads are distinguished by their connection, I argued that historical archaeologists may be able to consider parts of different continents within the same area or region. Thus, for a certain period of time, it may be argued that colonial Portugal and colonial Brazil, or colonial England and colonial South Africa, were part of the same area or region because of their relational ties. This understanding is quite distinct from

the cultural landscape, where what ties areas together is the cognitive, cultural processes of colonizers.

## A Brief Example

Given the requirements of a rigorous multiscalar network analysis in archaeology, much more space would be needed to present a complete example here. Nonetheless, it is still important to provide a brief specific example to demonstrate the interpretive power and potential of network analysis in archaeology. Space limitations prohibit a full example, and I understand that my example will be necessarily incomplete and sketchy. But, to demonstrate the value of network analysis I focus on the seventeenth-century kingdom of Palmares in northeast Brazil. As I have pointed out elsewhere (Orser, 1994b, 1996), Palmares provides an excellent case study for an archaeologically informed network analysis.

Palmares was a kingdom built in the present state of Alagoas in northeast Brazil by a number of runaway slaves around 1605. The colonial Portuguese government destroyed the settlement in 1694, but at its height, Palmares is thought to have had as many as 20,000 residents. In 1992 and 1993, I collaborated on an exploratory archaeological study of Palmares with Pedro Funari, and information about this research effort can be found elsewhere (Funari, 1995a, b; 1996a, b; Orser, 1992, 1993, 1994a, b; 1998a; Orser and Funari, 1992).

Palmares was a unified kingdom designed around resistance to enslavement and debasement. At the height of its development, Palmares was composed of ten discrete villages: Amaro, Arotirene, Tabocas (two villages), Zumbi, Aqualtene, Dambrabanga, Subupira, Macaco and Andalaquituche, with Macaco being the seat of the king (Figure 6.1). Research is not advanced enough to indicate precisely how the individual villages were connected. Historical records do clearly show, however, that the Palmarinos maintained continual relations with their environment. One observer who knew the condition of the territory of Palmares in the 1670s described it as "a naturally rugged place, mountainous, and dry, sown with all varieties of trees known and unknown" (Drummond, 1859: 304). The dense forests and the surrounding mountains helped to create Palmares, just as they sheltered and hid the Palmarinos from the invading colonial armies from the coast. At the same time, the environment sustained the people. Historical documents make it abundantly clear that they grew a variety of crops, caught fish, and domesticated fowl. They used the foliage for their homes, their basketry, and their defensive stockades, just as they used local clays to make pottery. Without question, the Palmarinos created and maintained a complex network of relationships with their environment.

At the same time, a series of complex social and power relationships helped to hold the kingdom together. The king of Palmares was a man named Ganga Zumba, and his brother, Gana Zona, ruled the

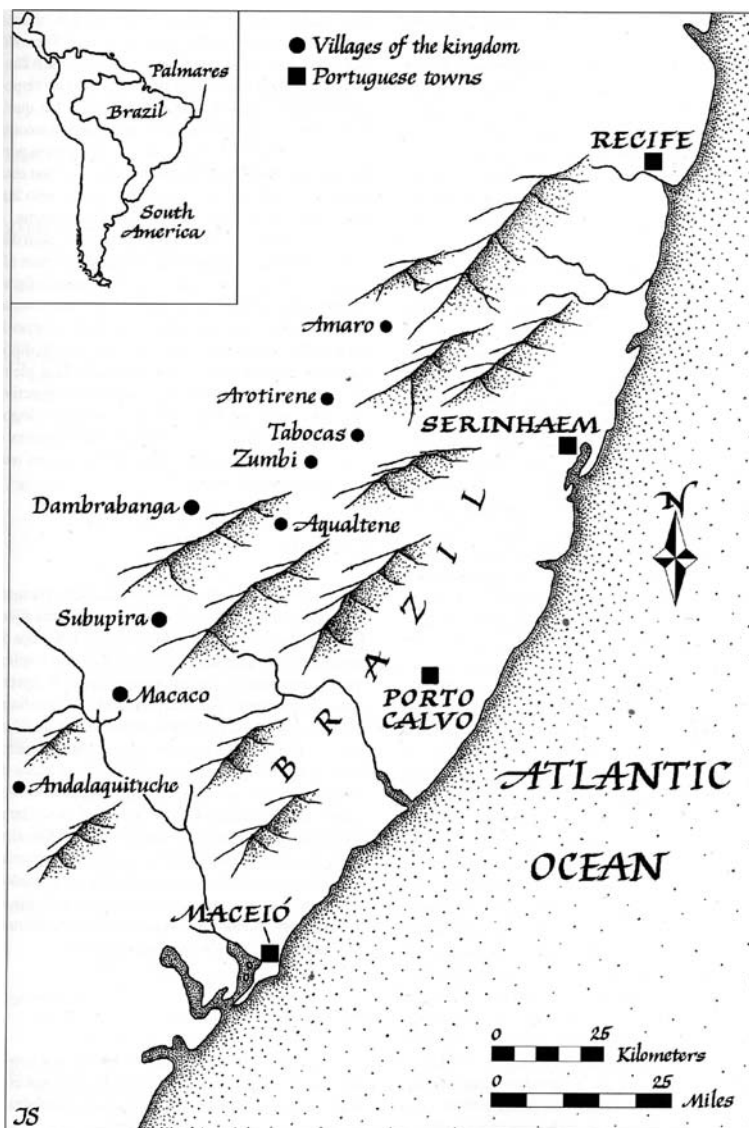


Figure 6.1. The Kingdom of Palmares.

kingdom's second city. The ruler of another town was the king's nephew, and that of another town, was his mother. Zumbi, the last great king of Palmares, was the king's nephew. Without question, kinship and power relations enacted as a series of interconnected dyads and triads helped to hold the kingdom together, even in the face of armed attack. This complex series of confederation and tributary relations helped to define Palmares both internally and externally (Anderson, 1996).

It would be relatively easy to argue that these relationships simply constitute cultural expression. All available evidence indicates that the Palmarinos busied themselves with building a new culture in the New World. But even this understanding allows for the presence of two

effective scales: the individual villages and the kingdom itself. It is only when we combine a multiscale perspective with a network approach that we can see other effective scales. For instance, within the kingdom itself existed a stark division between those Palmarinos who sought accommodation with the Portuguese and those who desired a constant, continual armed resistance. This conflict eventually caused Zumbi to murder his uncle the king, and to assume the reins of leadership. Similarly, a schism existed among the colonial Portuguese, because some Portuguese settlers living on the colonial frontier chose to support Palmares over their own colonial government. Thus, both in Palmares and outside on the frontier, power relations were constantly being enacted and redefined. Clearly, a full understanding of Palmares requires more than simple knowledge of the syncretic culture the fugitive men and women built among the palm trees of northeastern Brazil. A more complete understanding can be gained by adopting an explicit relational network model.

Further increasing the scale of analysis permits asking another question that otherwise may not be apparent: Why did the Dutch attack Palmares during their years in northeast Brazil? The answer to this question at first may seem too obvious to address. Caspar Barleus (1923: 315), a contemporary of Palmares, described the people who lived there as a "collection of robbers and fugitive slaves." Barleus was not alone in his perception of Palmares; most of its colonial enemies described it in the same terms. To them, the men and women of Palmares were simply thieves who robbed their coastal plantations. Knowing their perspective, it only makes sense that the colonial Dutch would seek to destroy the kingdom. But does this really make sense once we understand that the Dutch and the Portuguese were, in fact, deadly rivals in Brazil? Each superpower sought to control the native people and native riches of this part of South America. Keeping in mind the network model, we must ask why the colonial Dutch, enemies of the colonial Portuguese, did not create an alliance with Palmares, also enemies of the colonial Portuguese? Merely asking this question leads us to other questions: were the Dutch so appalled by the actions of the Palmarinos against another European nation that they sought to destroy it out of a sense of European solidarity? Or were the Dutch merely so racist that they simply sought to destroy a group of renegade Africans? Understanding a network model makes us wonder whether it was the connections the Palmarinos had made with Native Americans, with Portuguese settlers, and among themselves that really offended the Dutch (for details of these connections, see Orser, 1994b and 1996: 41–53). This multifaceted, interconnected web was a serious impediment to Dutch colonial expansion in the South American hinterland. Assuming that the Dutch believed they could wrest Brazil from the Portuguese, they may have decided to remove Palmares when the time seemed right. In any case, if the Dutch were simply racist, it would have made sense for them to unite with the Portuguese to destroy Palmares and, once this task was accomplished, to begin the quest for an empire against their former European allies.

The history and culture of Palmares was indeed complex, and it will take many more years of research before a new, truly meaningful reanalysis can be completed. Our initial archaeological research has only provided the briefest understanding of what is clearly an extremely deep and meaningful history. The application of a network perspective, however, permits archaeologists to ask new questions about Palmares and to approach an old topic in an entirely new way.

## Conclusion

Network analysis opens up exciting opportunities for archaeologists, especially those studying modern history. The presence of written documentation and even oral testimony means that historical archaeologists have the potential to learn about the connections that held men and women together in ways that may not be readily apparent simply from archaeological deposits. The true advantages of using network analysis in historical archaeological research have yet to be demonstrated in a large-scale study. Network analysis, when combined with a multiscalar perspective, however, has the potential to permit archaeologists to ask new and interesting questions about the past, and to provide important new interpretations.

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## References

- Anderson, R. N., 1996, The *Quilombo* of Palmares: A New Overview of a Maroon State in Seventeenth-Century Brazil. *Journal of Latin American Studies* 28: 545–566.
- Barleus, C., 1923, *Brazilië Onuder Het Bewind von Johan Maurits, Grave van Nassau, 1637–1644*. Martinus Nijhoff, Gravenhage.
- Barnes, A., 1954, Class and Committees in a Norwegian Island Parish. *Human Relations* 7: 39–54.
- Carrithers, M., 1992, *Why Humans Have Cultures: Explaining Anthropology and Social Diversity*. Oxford University Press, Oxford.
- Clarke, D. L., 1968, *Analytical Archaeology*. Methuen, London.
- 1977a, *Spatial Archaeology*. Academic Press, London.
- 1977b, Spatial Information in Archaeology. In *Spatial Archaeology*, edited by D. L. Clarke, pp. 1–32. Academic Press, London.
- Crumley, C. L., 1979, Three Locational Models: An Epistemological Assessment for Anthropology and Archaeology. In *Advances in Archaeological Method and Theory*, volume 2., edited by M. B. Schiffer, pp. 141–173. Academic Press, New York.



- De Cunzo, L. T., O'Malley, M., Lewis, J., Thomas, G. E., and Wilmanns-Wells, C., 1996, Father Rapp's Garden at Economy: Harmony Society Culture in Microcosm. In *Landscape Archaeology: Reading and Interpreting the American Historical Landscape*, edited by R. Yamin and K. B. Metheny, pp. 91–117. University of Tennessee Press, Knoxville.
- Deetz, J., 1990, Landscapes as Cultural Statements. In *Earth Patterns: Essays in Landscape Archaeology*, edited by W. M. Kelso and R. Most, pp. 1–4. University Press of Virginia, Charlottesville.
- 1991, Archaeological Evidence of Sixteenth- and Seventeenth-Century Encounters. In *Historical Archaeology in Global Perspective*, edited by L. Falk, pp. 1–9. Smithsonian Institution Press, Washington, D. C.
- Drummond, C., 1859, Relação das guerras feitas aos Palmares de Pernambuco no tempo de Governador D. Pedro de Almeida de 1675 a 1678. *Revista do Instituto Histórico e Geográfico Brasileiro* 22: 303–329.
- Durkheim, E., 1915, *The Elementary Forms of the Religious Life: A Study in Religious Sociology*, translated by J. W. Swain. Allen and Unwin, London.
- Funari, P. P. A., 1995a, A cultura material de Palmares: o estudo das relações sociais de um quilombo pela arqueologia. *Idéias* :37–42.
- 1995b, A República de Palmares e a arqueologia da Serra da Barriga. *Revista USP* 28: 6–13.
- 1996a, Novas perspectivas abertas pela arqueologia na Serra da Barriga. In *Negras Imagens*, edited by L. M. Schwarcz and L. V. de Reis, pp. 139–230. Editora da Universidade de São Paulo, São Paulo.
- 1996b, A arqueologia de Palmares: sua contribuição para o conhecimento da história da cultura afro-americana. In *Liberdade por um fio: história dos quilombos no Brasil*, J. J. Reis and F. dos Santos Gomes, pp. 26–51. Editora Schwarcz, São Paulo.
- Haggett, P., 1990, *The Geographer's Art*. Basil Blackwell, Oxford.
- Haggett, P., and Chorley, R. J., 1969, *Network Analysis in Geography*. St. Martin's Press, New York.
- Hassig, R., 1991, Roads, Routes, and Ties that Bind. In *Ancient Road Networks and Settlement Hierarchies in the New World*, edited by C. D. Trombold, pp. 17–27. Cambridge University Press, Cambridge.
- Hillier, B., and Hanson, J., 1984, *The Social Logic of Space*. Cambridge University Press, Cambridge.
- Hodder, I., and Orton, C., 1976, *Spatial Analysis in Archaeology*. Cambridge University Press, Cambridge.
- Houseman, M., 1997, Comment on Thomas Schweizer's "Embeddedness of Ethnographic Cases: A Social Networks Perspective". *Current Anthropology* 38: 753–754.
- Kelso, W. M., and Most, R., editors, 1990, *Earth Patterns: Essays in Landscape Archaeology*. University Press of Virginia, Charlottesville.
- Kent, S., 1984, *Analyzing Activity Areas: An Ethnoarchaeological Study of the Use of Space*. University of New Mexico Press, Albuquerque.
- Knoke, D., and Kuklinski, J. H., 1992, *Network Analysis*. Sage, Newberry Park, CA.
- Leone, M. P., 1995, A Historical Archaeology of Capitalism. *American Anthropologist* 97: 251–268.
- Leone, M. P., Stabler, J., and Burlaga, A-M., 1998, A Street Plan for Hierarchy in Annapolis: An Analysis of State Circle as a Geometric Form. In *Annapolis Past: Historical Archaeology in Annapolis, Maryland*, edited by P. A. Shackel, P. R. Mullins and M. S. Warner, pp. 291–306. University of Tennessee Press, Knoxville.
- Lesser, A., 1961, Social Fields and the Evolution of Society. *Southwestern Journal of Anthropology* 17: 40–48.
- Mander, J., 1996, Facing the Rising Tide. In *The Case Against the Global Economy and For a Turn Toward the Local*, edited by J. Mander and E. Goldsmith, pp. 3–19. Sierra Club Books, San Francisco.
- Marquardt, W. H., 1985, Complexity and Scale in the Study of Fisher-Gatherer-Hunters: An Example from the Eastern United States. In *Prehistoric Hunter-Gatherers: The Emergence of Cultural Complexity*, edited by T. D. Price and J. A. Brown, pp. 59–98. Academic Press, Orlando.

- 1992, Dialectical Archaeology. In *Archaeological Method and Theory*, volume 4, edited by M. B. Schiffer, pp. 101–140, University of Arizona Press, Tucson.
- Matthews, C. N., 1998, Part of a Polished Society: Style and Ideology in Annapolis's Georgian Architecture. In *Annapolis Past: Historical Archaeology in Annapolis, Maryland*, edited by P. A. Shackel, P. R. Mullins, and M. S. Warner, pp. 244–267. University of Tennessee Press, Knoxville.
- Milanich, J. T., 1998, Case of the Missing Moat. *Archaeology* 51(5): 58.
- Mitchell, J. C., 1974, Social Networks. *Annual Reviews of Anthropology* 3: 279–299.
- Orser, C. E., Jr., 1992, *In Search of Zumbi: Preliminary Archaeological Research at the Serra da Barriga, State of Alagoas, Brazil*. Report prepared for the National Geographic Society, Washington, D. C.
- 1993, *In Search of Zumbi: 1993 Season*. Report prepared for the National Geographic Society, Washington, D. C., and the Social Science Research Council, New York.
- 1994a, Searching for Palmares: the Serra da Barriga, Brazil. *National Geographic Research and Exploration* 10: 480–482.
- 1994b, Toward a Global Historical Archaeology: An Example from Brazil. *Historical Archaeology* 28: 1–18.
- 1996, *A Historical Archaeology of the Modern World*. Plenum, New York.
- 1998a, Archaeology of the African Diaspora. *Annual Reviews of Anthropology* 27: 63–82.
- 1998b, Epilogue: From Georgian Order to Social Relations at Annapolis and Beyond. In *Annapolis Past: Historical Archaeology in Annapolis, Maryland*, edited by P. A. Shackel, P. R. Mullins, and M. Warner, pp. 307–324. University of Tennessee Press, Knoxville.
- 1998c, Negotiating our 'Familiar Pasts'. In *The Familiar Past? Archaeologies of Britain, 1550–1950*, edited by S. Tarlow and S. West, pp. 273–285. Routledge, London.
- 2004, The Archaeologies of Recent History: Historical, Post-Medieval, and Modern-World. In *The Blackwell Companion to Archaeology*, edited by J. Bintliff, pp. 272–290. Blackwell, Oxford.
- Orser, C. E. Jr., and Funari, P. P. A., 1992, Pesquisa arqueológica inicial em Palmares. *Estudos Ibero-americanos* 18: 53–69.
- Rabinow, P., editor, 1994, *The Foucault Reader*. Pantheon, New York.
- Radcliffe-Brown, A. R., 1940, On Social Structure. *Journal of the Royal Anthropological Society of Great Britain and Ireland* 70: 1–12.
- Sanjek, R., 1996, Network Analysis. In *Encyclopedia of Social and Cultural Anthropology*, edited by A. Barnard and J. Spencer, pp. 396–397. Routledge, London.
- Scott, A. J., 1998, *Regions and the World Economy: The Coming Shape of Global Production, Competition, and Political Order*. Oxford University Press, Oxford.
- Schweizer, T., 1997, Embeddedness of Ethnographic Cases: A Social Networks Perspective. *Current Anthropology* 38: 739–760.
- Shackel, P. A., Mullins, P. R., and Warner, M. S., editors, 1998, *Annapolis Past: Historical Archaeology in Annapolis, Maryland*. University of Tennessee Press, Knoxville.
- Sheppard, E., and Barnes, T. J., 1990, *The Capitalist Space Economy: Geographical Analysis After Ricardo, Marx and Sraffa*. Unwin Hyman, London.
- Soja, E. W., 1989, *Postmodern Geographies: The Reassertion of Space in Critical Social Theory*. Verso, London.
- Struever, S., 1964, The Hopewell Interaction Sphere in Riverine-Western Great Lakes Culture History. In *Hopewellian Studies*, edited by J. R. Caldwell and R. L. Hall, pp. 85–106. Illinois State Museum, Springfield.
- Struever, S., and Houart, G. L., 1972, An Analysis of the Hopewell Interaction Sphere. In *Social Exchange and Interaction*. E. N. Wilmsen, pp. Museum of Anthropology, University of Michigan, Ann Arbor.
- Trombold, C. D., 1991, An Introduction to the Study of Ancient New World Road Networks. In *Ancient Road Networks and Settlement Hierarchies in the New World*, edited by C. D. Trombold, pp. 1–9. Cambridge University Press, Cambridge.
- Warner, M. S., 1998, 'The Best There Is of Us': Ceramics and Status in African American Annapolis. In *Annapolis Past: Historical Archaeology in Annapolis, Maryland*, edited

- by P. A. Shackel, P. R. Mullins, and M. S. Warner, pp. 190–212. University of Tennessee Press, Knoxville.
- Wasserman, S., and Faust, K., 1994, *Social Network Analysis: Methods and Applications*. Cambridge University Press, Cambridge.
- Wiley, G. R., 1953, *Prehistoric Settlement Patterns in the Viru Valley, Peru*. Smithsonian Institution, Bureau of American Ethnology Bulletin 153. Government Printing Office, Washington, D. C.
- Wolf, E. R., 1982, *Europe and the People without History*. University of California Press, Berkeley.
- 1984, Culture: Panacea or Problem? *American Antiquity* 49: 393–400.
- Yamin, R. and Metheny, K. B., editors., 1996, *Landscape Archaeology: Reading and Interpreting the American Historical Landscape*. University of Tennessee Press, Knoxville.
- Zimmerman, L. J., 1977, *Prehistoric Locational Behavior: A Computer Simulation*. Report 10, Office of the State Archaeologist. University of Iowa, Iowa City.