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LANDSCAPES *of* MOVEMENT

Trails, Paths, and Roads
in Anthropological Perspective

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Making Human Space: The Archaeology of Trails, Paths, and Roads

JAMES E. SNEAD, CLARK L. ERICKSON,
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Foi paths are the graphic effect of intentional, creative movement across the earth. They transform the ground, partition the earth and create human space . . .

- James Weiner, *The Empty Place: Poetry, Space, and Being among the Foi of Papua New Guinea*

Trails, paths, and roads are essential structures of the human landscape. They weave together the disparate elements of daily lives, bridging distance and obstacles to connect us to each other. James Weiner's description of the paths made by the Foi people of New Guinea captures the complex relationships between space, place, and movement that these features articulate (1991). Trails, paths, roads, ways, tracks, trackways, and related phenomena represent *landscapes of movement*, a context for "getting there" that evolves through action and design, incorporating everything from the traces of daily strolls to the mailbox to continent-spanning superhighways. In the process their physical structures engage such diverse fields as engineering, knowledge systems, aesthetics, historical memory, and cosmology.

Despite their fundamental nature in structuring and reflecting human

life, substantive treatments of these features are rare in the anthropological literature. "Few of these show on my maps," wrote T. T. Waterman in his ethnogeography of the Yurok country of northern California, 'because I did not travel the trails myself' (1920:222). Ethnographies may explore the varied semantic fields associated with such features-the metaphor of the "path," in particular, is widely employed cross-culturally (cf Evans 1999; Koskinen 1963;Toren 1999;Abercrombie 1998;Keller, Chapter 7, this volume)-but rarely is such conceptual material complemented by a concern for the physical features themselves.

These circumstances have also characterized archaeological approaches to trails, paths, and roads, but a handful of recent publications have demonstrated the potential for this research to contribute to broader discussions of the human past. In the New World, John Hyslop's *The Inka Road System* (1984; see also Hyslop 1991) used the dramatic archaeological evidence of Inka roads to highlight the value of long-term regional archaeological research, a systematic survey field program, and careful use of historical and ethnographic documents to build a detailed understanding of such critical infrastructure. Of even greater influence was *Ancient Road Networks and Settlement Hierarchies in the New World*, which included diverse studies from throughout the Americas (Tombold 1991a). This volume made the case that trails, paths, and roads could be treated as built environment, amenable to description, classification, analysis, and interpretation in much the same way artifacts or architecture are treated in traditional archaeology. New theoretical ground was also broken, as some authors sought ways to bring trails, paths, and roads into larger explanatory structures of archaeological theory, particularly in the context of cultural evolution (Earle 1991; Hassig 1991).

Even the successful application of archaeological strategies regarding trails, paths, and roads as outlined by the Hyslop and Tombold volumes highlighted the considerable challenges that further work would have to overcome. Questions of definition and scale are particularly daunting. Our traditional emphasis on sites and monuments is a poor fit for features that cannot be reduced to points on a map or bounded spaces. By their nature, trails, paths, and roads often have no beginning or end. The complex web-like characteristics of local and regional scale networks of landscapes of movement are difficult to map and bound as data. The discontinuous, segmentary nature of archaeological landscapes of movement also confuses

and confounds. Even the most flexible research strategy breaks down when confronted with features that span continents and centuries.

Structures of archaeological knowledge present additional limitations on the study of trails, paths, and roads. Despite the universality of these features most research has been conducted in isolation, with rare cross-citation. Potentially productive insights and concepts thus either languish or are continually re-invented.

In the face of these daunting challenges, the rising influence of landscape theory in archaeology has provided the opportunity for a revolution in the study of trails, paths, and roads. The concept of landscape bridges methodological barriers and regional differences, creating a flexible analytical framework in which previously overlooked archaeological data can be seamlessly integrated into a broader discussion (e.g., Anschuetz, Wilshusen, and Scheick 2001; Ashmore 2003; Ashmore and Knapp 1999; Bender 1993; Bender and Winer 2001; David and Wilson 2002; Feld and Basso 1996; Hirsch and O'Hanlon 1995; Low and Lawrence-Zuniga 2002; Rodman 1992; Tilley 1994, 2003; Ucko and Layton 1999; Wilkinson 2003). The lens of landscape focuses our attention on issues of pattern, scale, context, and association, all critical components of movement, without mandating a particular structure for each category. In a landscape sense, both the path to the corner and the superhighway are *meaningful*, each a part of the broader context.

Taking a new look at trails, paths, and roads is thus a logical outgrowth of the paradigm shift towards the archaeology of landscape. Movement is a central component of many of the influential landscape studies of the past two decades (e.g., Barrett 1999a, 1999b; Thomas 1996), although the topic is seldom treated in detail. Peter Fowler, however, argues that movement is essential to the "dynamism" of landscape itself (1998:25), a primary theme both of Heather Miller's "landscapes of transportation" (2006:28) and Pierce Lewis's "landscapes of mobility" (1996).

We contend that the next step in building the framework for landscapes of movement is the thorough establishment of context, with all the intricate cultural and material details that this implies. One particular strength of the landscape approach to the study of trails, paths, and roads is that it sidesteps questions of their definitions. Landscapes of movement imply a focus on pattern, scale, context, and association incorporating the fabric of the features themselves. These articulations ultimately provide a much

stronger source for inference and interpretation, making the question of whether something is a "trail," "path," or "road" largely irrelevant.

GLOBAL PERSPECTIVES: A BRIEF REVIEW

A brief review of the more recent archaeological literature on trails, paths, and roads highlights the considerable value in this work, both in terms of the aggregate data available and on the different approaches adopted (for overviews, see Morriss 2005; Scarre 1996). The older literature remains useful reading, both in terms of the evidence itself and in the structures of knowledge that produced it (Addison 1980; Brew 1950; Ayres 1940; Myer 1929; McClintock 1910; Timperley and Brill 1965).

Formal study of landscapes of movement has the longest history in the greater Mediterranean region, where generations of scholars have documented networks of roads associated with the Roman Empire (Chevallier 1976; Staccioli 2004; Vermeulen and Antrop 2001). These studies are traditionally topographic in nature, identifying routes and contexts of Roman roads in intricate detail. This research is most advanced in the former imperial core, and researchers working in Italy have synthesized archaeological and textual data from many of the famous imperial *viae* (for example, the Via Appia, Della Portella 2004; the Via Severiana, Fogagnolo and Valenti 2005; the Via Claudia Augusta, Galliazo 2002), as well as secondary routes in the Italian countryside (Fredricksen and Ward-Perkins 1957; Kahane, Threipland, and Ward-Perkins 1968). Some recent research focuses on technical aspects of road building (Capedri 2003) and on roads associated with particular types of activity, such as quarrying (Vanhove 1996). On the whole interpretative treatment of the Roman road network at large scale remains documentary and conservative, a situation echoed by research on their Etruscan predecessors (Barker and Rasmussen 1998:172; Potter 1979: 79-81) (for exceptions, see Laurence 1999; Bell, Wilson, and Wickham 2002; Vermuelen and Antrop 2001).

Road studies are also numerous from the former Roman provinces. The Northern European literature is extensive, including general syntheses (Crawford 1953; Davies 2002; Margary 1967) and studies of particular routes and regions (e.g., Dowdle 1987; Fowler 2000; Matthews 2002; Vermeulen and Antrop 2001). Anatolia and the Levant are other areas where significant attention has been paid to Roman roads, both the inter-regional routes

(e.g., Fischer, Isaac, and Roll 1996; French 1981, 1996; Graf 1995, 1997; Kennedy and Riley 1990; MacDonald 1996; Savage, Zamora, and Keller 2002; Van Liere and Lauffray 1954) and connectors (e.g., Ben-David 2002; Borstad 2000; Comfort, Abadie-Reynal, and Brgec 2000; Comfort and Brgec 2001; Isaac and Roll 1982; Kennedy 1997; Roll 2002; Strobel 1997).

Research on landscapes of movement for earlier Mediterranean periods has been less systematic. A body of research on road systems dating as early as the Aegean Bronze Age does exist (i.e., Jansen 2001; Lavery 1990, 1995; Mylonas 1966). Field documentation of Classical Greek roads, part of a generations-long topographical program (Pikoulas 1999; Pritchett 1980; Young 1956), is rapidly expanding, with several recent dissertations that address the subject (Bynum 1995; Lolos 1998; Marchand 2002).

A similar situation exists for the pre-Roman Near East, where reconnaissance and studies based on texts or artifact style are the rule (Birmingham 1961; Dearman 1997; Dorsey 1991; Garstang 1943; Klöner and Ben-David 2003; McDonald 1988; Sevin 1988). The Achaemenid road system, famous in its day (Briant 1996), has stimulated relatively little archaeological research, although the situation is changing (Graf 1994; French 1998; Tal 2005) and new excavations at a road station possibly used by Achaemenid elites promise interesting results (Potts et al. 2007). Relatively few systematic studies of landscapes of movement at a large scale have been conducted in the region, making the recent contributions of Jason Dr (2003, 2004; Chapter 9, this volume) and Tony Wilkinson (1993, 2003) on Bronze Age roads in Syria and Mesopotamia particularly valuable (Borstad 2000; Blakely and Sauer 1985). The Egyptian case is distinct, since in many cases the Pharaonic, Ptolemaic, and Roman period road networks coincide (Gates 2005a, 2005b; Jackson 2002; Sidebotham and Zitterkopf 1995; Sidebotham, Zitterkopf, and Riley 1991; Wright 2003). Studies more explicitly focused on the Pharaonic period and earlier also exist (Darnell 2002; Darnell and Darnell 2002; Fenwick 2004; Hester, Hobler, and Russell 1970).

Information on the trails, paths and roads of prehistoric Europe is based on rigorous field archaeology. Studies of "barrow roads" in the Netherlands (Bakker 1976; Jager 1985) and on *cursus* features in Britain (Barrett 1994:137; Barrett, Bradley, and Green 1990; Johnston 1999) have documented the close association between particular forms of movement and monumental architecture. Evidence preserved in relict upland landscapes in Britain (Fleming 1988, 1998; Fowler 2000) and south-central France (Fowler 1998) reflects

patterns of local travel over long periods of time. Similar inferences have been derived from studies of preserved trackways in wetland environments (Casparie 1987; Coles and Coles 1986; Raftery 1990; Thomas and Rackham 1996).

Archaeological study of landscapes of movement elsewhere in Eurasia remains embryonic (Chakrabarti 2005; Hiebert 1999; Miller 2006; UNESCO 2004). Work is expanding in several areas, however, including road networks associated with the Khmer polity in Southeast Asia (Bruguier 2000; Coe 2003:152; Hendrickson 2007, 2008; Im 2004). Despite significant ethnohistoric evidence (e.g., Falola 1991), roads and paths in West Africa have yet to be the subject of archaeological research. Descriptions of deeply incised trails associated with the Ife earthworks (Darling 1984:12), references to the "royal roads" built by the Asante kings of Kumase (McLeod 1981: 20), and formal stairways in the Mandara Mountains of Cameroon and Nigeria (Sterner 2003) indicate considerable opportunity for archaeological fieldwork, as do scattered notations in the southern Africa literature (e.g., Dierks 1992; Kinahan 1986).

The medieval and historic periods represent a final area of concern for Old World research on trails, paths, and roads. Associated studies include broad regional overviews (Guest 2005; Hindle 1993, 1998; Ferreira Priegue 1988) as well as detailed landscape studies (Fleming 1998) and examinations of specific features (Gibson 2007; Pasztor et al. 2000). Relatively little archaeological attention has been directed toward the growth of regional transportation networks in Europe during more recent centuries, but this is changing (e.g., Quartermaine, Trinder, and Turner 2003).

Turning to the New World, research on landscapes of movement in Latin America has largely been associated with precolumbian states and empires. Hyslop's groundbreaking research on the Inka roads was preceded by others (Kosok 1965; Regal 1936; Stothert-Stockman 1967; Strube 1963; Ubbelodde Doering 1966; Von Hagen 1979). In more recent decades, there have been numerous detailed studies that either fill in gaps in coverage of the main imperial network (Castro et al. 2004; Gutierrez 2005; Gutierrez and Jaimes 2000; Hocquenghem 1994; Hyslop 1990; Hyslop and Rivera 1985; Niemeyer and Rivera 1983; Raffino 1993; Sanhueza Tohá 2004; Stehberg, Carvajal, and Seguel 1996; Stehberg and Cabeza 1991; Stehberg and Carvajal 1986; Espinoza 2002), discuss roads in the context of the complex landscape of the Inka capital of Cuzco (Bauer 1998), or examine specific

local or provincial routes (Coello R. 2000; Kendall 2000; Lynch 1993, 1996; Protzen 1993). Studies of Pre-Inka road systems for the Wari (Isbell and Vranich 2004; McEwan 1987; Schreiber 1984, 1991, 1992) and Moche (Beck 1979, 1991), and other cultures (Wallace 1991) show that Andean peoples have a long history of roadbuilding. Most studies emphasize economic and political aspects of trails, paths, and roads; but a substantial body of literature emphasizes ritual movement in the Andean context (Aveni 1990; Bauer 1998; Bauer and Dearborn 1995; Clarkson 1990; Dearborn and Bauer 1996; Hawkins 1969, 1974; Mejia Xesspe 1939; Morrison 1978; Zuidema 1964), in addition to a growing body of literature on roads of the colonial Andes (Amodio, Navarrete, and Rodriguez 1997; Moreno and Gonzales 1995; Abercrombie 1998).

Interest in indigenous landscapes of movement beyond the central Andes has recently expanded, including preliminary studies on precolumbian trails, paths, and roads in the Atacama desert of Chile (Briones, Nunez, and Standen 2005; Clarkson and Briones 2002, 2001; Valenzuela 2004; Bowman 1924), Colombia (Botero Paez, Vélez Escobar, and Guingue Valencia 2000; Cardale de Schrimppf 1996, 2000a, 2000b; Groot de Mahecha 2000; Herrera and Cardale del Schrimppf 2000; Oyuela-Caycedo 1990; Vidal and Zucchi 2000), and lowland Ecuador (Lippi 2000). New research in the Amazon Basin (Bengtsson and Aviles 2000; Erickson 2000c, 2001; Heckenberger 2005, 2008; Heckenberger et al. 2007) has significantly transformed our views of roads, paths, and trails in this difficult terrain (also see Silverman and Isbell 2008).

In Mesoamerica and the Intermediate Area, formal research on landscapes of movement remains relatively sparse, despite the significant archaeological remains present and despite early attention to this question (e.g., Saville 1930; Villa-Rojas 1936) and provocative ideas developed by research based on ethnography and indigenous documents (Bolles and Folan 2001; Castillo 1969; Genotte 2001; Jett 1994; Keller 2006; Reina A. 1998). The literature is most comprehensive on the subject of *Maya'sakbeh* (summarized in Shaw 2001), with a particular emphasis on those features connecting different areas within or adjacent to major centers (i.e., Charlton 1991; Chase and Chase 2001; Cobos and Winemiller 2001; Folan 1991; Folan et al. 2001; Keller 2006), plus examination of *sakbeob* (pl. of *sakbeh*) on a more regional level (Kurjack and Andrews 1976; Reid 1995; Shaw 2008). Rare examples from highland Mesoamerica beyond the Maya region indicate potential

opportunities (Gorenstein and Pollard 1991; Hirth 1991; Trombold 1991c). Fieldwork conducted by Payson Sheets in Costa Rica (McKee, Sever, and Sheets 1994; Sheets and Sever 1991; Sheets, Chapter 8, this volume) also points the way towards new studies of precolumbian roads in this region, as do examinations of historic period roads (Ng 2007; Ng and Cackler 2006).

Early fieldwork on landscapes of movement in western North America emphasized secondary data such as trade goods (e.g., Davis 1963; Sample 1950) and some field reconnaissance (Britt 1973; Colton 1964; Eiseman 1959; Harner 1957; Hinds 1959; Howard 1959; Ives 1946; Johnson and Johnson 1957; Rogers 1966). Intensive fieldwork followed, greatly enriching our understanding of local context (Becker and Altschul 2008; Pignuolo, Underwood, and Cleland 1997; Von Werlhof 1988; Waters 1982). In a similar fashion early fieldwork on paths and trails in the Great Plains and Northern Rockies (Malouf 1962) stimulated continuing study, producing among other things an entire issue of *Archaeology in Montana* (1980; see also Blakeslee and Blasing 1988; Campbell and Field 1968).

The influence of intensive survey projects on the study of trails, paths, and roads is particularly evident in the American Southwest. The famous Chaco roads, for example, were known only via brief comments before the launching of major survey research in the 1970s (Gabriel 1991; Hurst, Severance, and Davidson 1993; Kantner 1997; Kincaid 1983; Lekson 1999; Marshall 1997; Mathien 1991; Pattison 1985; Roney 1992; Schreiber 1997; Severance 1999; Snygg and Windes 1998; Stein 1983; Stein and McKenna 1988; Van Dyke 2008; Vivian 1997a, 1997b; Windes 1991). Despite a few earlier suggestions (e.g., Hartmann and Hartmann 1979; Steen 1977), systematic fieldwork on other Southwest paths, roads, and trails largely postdates the Chaco work (Adams et al. 1989; Becker and Altschul 2008; Darling, Chapter 4, this volume; Darling and Eiselt 2003; Motsinger 1998; Ferguson, Berlin, and Kuwanwisiwma, Chapter 2, this volume; Pattison and Potter 1977; Pitezal 2007; Snead 2002, Chapter 3, this volume; Snead and Preucel 1999; Swanson 2003). Trail studies drawing from ethnographic knowledge are increasingly influential, with detailed studies such as Stephen Jett's research on Navajo trails at Canyon de Chelly (2001), various projects associated with the Zuni Salt Lake (Berlin, Ferguson and Hart 1985; Ferguson, Berlin, and Hart 1995; Hart and Othole 1993), and research at Hopi (Ferguson, Berlin, and Kuwanwisiwma, Chapter 2, this volume; Zedefio 1997) demonstrating new opportunities.

Only a few research initiatives on trails, paths, and roads can be cited from elsewhere in North America. Formal features associated with the Hopewell culture of the Ohio River valley have recently attracted considerable comment and await more comprehensive fieldwork (Lepper 1995, 1996). A few studies of other precolumbian paths and trails in this region exist (Kapches 1992; Myers 1997). New North American initiatives emphasize the historic period, where interest in more recent roads and road networks has increased (Fisher 1999; Purser 1988; Raitz 1996; Schlereth 1997).

Oceania is a final area that has stimulated research on landscapes of movement. Fieldwork on roads and paths in Hawaii have benefited from ethnohistory (Apple 1965; Kaschko 1973; Mills 2002), and references to these features are intrinsic to discussions of the intricate archaeological record of the islands (e.g., Kirch 1992). Two recent studies, one focusing on Rapa Nui (Lipo and Hunt 2005) and the other on Raratonga (Campbell 2006), demonstrate the diversity of evidence for constructed roads in Polynesia. In the case of Micronesia, unpublished reports of trail features on Kosrae (Beardsley 2006) suggest that further fieldwork would pay considerable dividends. Evaluation of Aboriginal trails and paths in Australia draws heavily from the extensive literature on dreamtime or "The Dreaming" (e.g., Goodale 2003; Myers 1986, 1991; Price-Williams and Gaines 1994; Spencer and Gillen 1968; Tonkinson 2003). Archaeologists and ethnographers relate "dreaming tracks" to COgnitive geography and routes of ceremonial and economic exchange (Clowczewski 2000 as reviewed in Lohmann 2004; Smith and Burke 2007:42-46).

This brief foray into the archaeological literature on landscapes of movement is not intended to be exhaustive, and is biased towards English-language sources. Nonetheless, the volume of research on trails, paths, and roads is clearly sufficient for this topic to be treated holistically; scholars following these paths have adopted many different methodological and theoretical strategies, to which we next turn our attention.

METHODOLOGY

The complex palimpsest and often ephemeral evidence for landscapes of movement require distinct methods from those of traditional site-based archaeology. Some approaches inevitably derive from local topography, environment, and culture history; but some broad trends are evident. We will

briefly review these here, with allusion to projects that make particularly lucid case studies.

Reconnaissance Survey

The traditional method for exploring trails, paths, and roads in the archaeological record is to follow them. Many scholars have noted that the logic of travel in particular settings is only evident on foot (e.g., Lynch 1993; Bell, Wilson, and Wickham 2002:185; Hyslop 1984). Simply walking a trail, of course, implies that it is there to be seen, not a trivial issue in most situations. Modern environment, terrain, and boundary issues present considerable obstacles, and walking a Maya *sakbeh* or an Amazonian causeway today requires considerable expertise with a machete. In some instances, linear arrangements of contemporaneous sites alone have been argued to reflect the presence of roads or paths (MacDonald 1988:212). An additional challenge is to link the road underfoot to a particular time period of construction and use. Much of the literature on road networks of the Eastern Desert of Egypt, for instance, focuses on identifying the builders and users of these systems, since there is often little physical modification of the routes themselves to interpret (compare Gates 2005a, 2005b; Sidebotham, Zitterkopf, and Riley 1991; Wright 2003).

Intensive Survey

Intensive pedestrian survey establishes the material context for human activities at increasingly greater scale, allowing associations to be made between multiple categories of evidence (Crumley and Marquardt 1987; Darvill 1999; Plog 1990). This approach has proven essential for the study of landscapes of movement because it emphasizes physical and temporal context at multiple scales and time periods. Thus, archaeologists can identify not only potential beginnings and endpoints of routes and their specific character, but also what they pass along the way. In the case of the trails of the Pajarito plateau of the American Southwest, the results of a major site survey project (Powers and Orcutt 1999b) not only identified trails but also the thousands of features associated with them in the landscape, providing a deeper context within which movement along them in different eras could be evaluated (Snead 2002; Van Zandt 1999).

Of course, even the largest survey areas have arbitrary boundaries, and inevitably trails, paths, and roads will cross these and disappear into the dis-

tance. Surveys are scale-dependent, and relatively few operate at the macro level required to understand regional and interregional routes. In traditional archaeology, contextualizing landscapes of movement will remain a relatively localized option for the foreseeable future.

Remote Sensing

Our appreciation of landscapes of movement has been revolutionized by remote sensing. The aerial reconnaissance of the mid-20th century opened up new frontiers for road studies in various places, such as Rome's eastern frontier (Van Liere and Lauffray 1954-55; Kennedy 1982), the Peruvian coast (Kosok 1965), and Central America (Sheets and Sever 1991). Remote sensing allows for the identification of routes of movement in terrain that is difficult to survey, either due to topography, vegetation, or access (Lepper 1996; Madry 1987; Vermuelen and Antrop 2001).

Satellite imagery has added a potent tool to the remote sensing of trails, paths, and roads, a potential demonstrated by recent work in the Iraqi-Syrian Jezira by Jason Ur and Tony Wilkinson (Wilkinson 1993, 2003; Ur 2003, 2004, Chapter 9, this volume). Using CORONA satellite imagery, they have documented a particular form of "trackway" associated with settlements of the 3rd millennium BE, numbering in the thousands and clearly a major structural element of the Bronze Age countryside. This approach not only demonstrates the technical utility of a particular remote sensing platform but also breaks important new ground by using GIS to integrate such data and to use it to query interpretive models of Bronze Age society in the Near East.

Geographic Information Systems (GIS)

Study of landscapes of movement is one of the many aspects of archaeological research that has been transformed by the use of Geographical Information Systems (GIS). At one level, GIS analysis provides the opportunity to predict the course of trails, paths, and roads on the basis of topography when physical evidence for these features is lacking. Calculating such "cost pathways" is an increasingly common way to model movement through the countryside (Bell and Lock 2000; Bell, Wilson, and Wickham 2002; Frachetti 2006, 2008; Gaffney and Stancic 1996; Madry and Crumley 1990; Madry and Rakos 1996; Wiedemann, Antrop, and Vermuelen 2001).

For example, John Kantner's GIS study of Chaco roads (1997) tested the

orientation of these features against a "rational" pattern of travel across the landscape. His demonstration that the Chaco roads of Lobo Mesa, New Mexico, were a poor "fit" for the model supports inferences that they were more than purely functional routes. In addition, Kantner was able to infer the presence of what may have been more functional pathways linking different Chaco sites, a contention supported by the presence of particular types of archaeological features along those routes. A second generation of GIS research on landscapes of movement is now emerging, which is more theoretical in orientation (Brett 2007; Harris 2000; Llobera 1996, 2000). As these approaches develop, some of the strictures of the "least cost" approach will be shed and more truly social models constructed.

Excavation

Despite the fact that trails, paths, and roads are notoriously difficult to excavate, a number of recent studies demonstrate that subsurface testing provides useful information. These include the Costa Rican pathways studied by Payson Sheets and his team, where excavation has revealed both the structure of the routes themselves and, through association with various layers of volcanic tephra, provided dates for their period of use (Sheets, Chapter 8, this volume). In the case of constructed features, testing can not only supply stylistic and chronological information but also contribute toward studies of construction and energetics, and an understanding of features associated with trails, paths, and roads (e.g., Cardale de Schrimpf 1996:161; Erickson 2000c, Chapter 10, this volume; Loendorf and Brownell 1980; Vermeulen and Antrop 2001).

A spectacular example of excavation in the context of landscapes of movement is provided by work in the Somerset Levels of southwestern England conducted over many field seasons by John Coles, Briony Coles, and their team (Coles and Coles 1986). Wooden trackways of a variety of construction types and ages have been unearthed in these drained wetlands, including the 1800-m-long "Sweet Track" dated to the late 4th millennium B.C. Their detailed evidence has led them to numerous hypotheses about local and regional movement during this era, including construction and reconstruction strategy, labor allocation, and patterns of mobility in the landscape (Raftery 1990; Casparie 1987). Little of this information would have been available without excavation.

Additional Approaches

Other methods have been employed by archaeologists studying landscapes of movement. Many of these are adopted in the relative absence of specifically archaeological data, intended to model possibilities as much as to document realities. Thus the network analyses of routes in Central Mexico presented by William Santley (1991) is developed in the apparent absence of material evidence for actual routes of travel (see also Gorenflo and Bell 1991; Jenkins 2001). Graph analysis has been applied to the study of Roman roads using textual evidence for their routes (Graham 2006). Other potential methods for the study of trails, paths, and roads, such as space syntax, which uses a formal spatial grammar to define accessibility (Hillier and Hanson 1984), are rarely put into practice.

THEORETICAL AND INTERPRETIVE PERSPECTIVES

Studies of trails, paths, and roads increasingly draw on anthropological and archaeological theory; using landscapes of movement as components of broader discussions on the nature of the human past. These approaches are diverse, reflecting various research problems and intellectual trajectories. Here we profile several schools of thought that have either been influential on current research or show promise for the future.

Political Economy

Landscapes of movement "move" things, including people, livestock, and material goods. Such movement can reflect tribute, trade, and other elements that make political systems work. Interpreting trails, paths, and roads through the lens of political economy thus has a long history. In many related studies, this focus is implicit rather than explicit, but several scholars have drawn attention to the ways that our understanding of sociopolitical systems can be enhanced by considering the structure of movement (e.g., Ur, Chapter 9, this volume).

The work of Ross Hassig has been particularly influential in the incorporation of data from trails, paths, and roads into a discussion of political economy (1985, 1991). By developing a materialist model of transport costs in Central Mexico, Hassig identifies changing patterns of political integration and the mobilization across the late precolumbian/Colonial boundary. Some influential studies of Maya *sakbeob* examine how these features estab-

lish hegemony and control, whether on a local scale, as at the site of Caracol (Chase and Chase 2001), or on a more regional level, as David Friedel and colleagues have interpreted the 100-km. causeway connecting the Maya centers of Cobá and Yaxuna (Ambrosino et al. 2003; cf Shaw 2001, 2008).

The integrative effects of trails, paths, and roads have also been used to question models of economic and political self-sufficiency. Peter Mills, for instance, suggests that the evidence for roads and paths connecting different *ahupua'a* on the island of Hawaii implies that interaction between these social/economic units may have been more common than traditionally thought (2002; Lee 2002). The relationship between political transformation and the reorganization of landscapes of movement has been detailed for the Roman case by Jason Dowdle, using data from the influential Burgundian Landscapes project (1987), a case that is made by Erickson and Walker, Sheets, and Ur (Chapters 11, 8, and 9, respectively, this volume).

Phenomenology and Spatial Theory

Since the 1990s, phenomenological approaches to landscapes have had considerable influence. Drawing from a diverse range of 20th century theorists, these strategies are built on the principle that the human body is the principal, shared element in our *experience* of our surroundings (e.g., Casey 1996; Thomas 1993, 1996; Tilley 1994, 2004). Focus must thus be placed on how landscape shapes relationships through sight, sound, and feeling. As Julian Thomas observes, "The quality of place emerges out of the way in which spaces are inhabited by human bodies, gaining in familiarity through interpretation and sensuous experience" (1998:87). Culturalized spaces have a concrete reality and are formed by the interaction of human experience in Nature and ideology (Lefebvre 1991; Soja 1989).

The relevance of phenomenology for landscapes of movement has been most carefully articulated in Christopher Tilley's *A Phenomenology of Landscape* (1994; 2004), in which paths play a central role. "Paths," he writes, "form an essential medium for the routing of social relations, connecting up spatial impressions with temporally-inscribed memories" (1994:31). In the context of the British Neolithic, which is his particular concern, paths would have linked settlements and monuments and thus played a critical role in how these places were approached, effectively creating a "narrative" of experience.

Critiques of archaeological applications of phenomenology have ap-

peared which express skepticism that we can actually share experience with our predecessors (Bruck 1998; Fleming 1999). The passing of time and transformation of the landscape makes it certain that what they saw and what we see along the way are not the same thing. The idea that experience is in itself a social construct has recently been emphasized (cf Myers 2000), generating additional difficulty in understanding experiences of people in other societies through the archaeological record.

With such caveats in mind, phenomenology has obvious utility for the study of trails, paths, and roads (e.g., Chadwick 2004). For instance, a phenomenology of Roman roads has recently been applied in Italy (Laurence 1999) and Britain (Matthews 2002; Witcher 1998), and to the Chaco roads (Van Dyke 2008). Ultimately, phenomenology and related spatial approaches inform us about alternate cultural systems of managing geographic information. These include song geographies (Darling, Chapter 4, this volume), the representation of social relations through metaphors of space, place, and paths (Myers 1986; Parmentier 1987:114-16), and the role of cognitive maps in wayfinding, particularly in unfamiliar environments (Golledge 2003; Bender 2001).

Practice Theory and Structuration

Poststructural approaches of social theory have influenced contemporary archaeology, providing powerful tools for understanding the dynamics, production, and reproduction of culture (e.g., Hodder and Preucel 1996). Practice theory (Bourdieu 1977) and structuration theory (Giddens 1984) provide explanatory frameworks for teasing out the complex recursive relationship between human agency and structure. Trails, paths, and roads are the creation of human agency and result from the physical alterations of landscape through the practice of everyday life. Once established, these same features structure the everyday life of agents by channeling their movement through physical structures that either enhance or inhibit circulation (Erickson, Chapter 10, this volume).

Although not explicitly applying practice theory, Tim Ingold's (1993, 2000) concept of taskscape and sensitive landscape perspective captures the interrelationship between movement, work, the seasonal cycle, and environmental transformation producing a highly patterned rural countryside, which in turn provides the mental and physical template for proper existence. Cynthia Robin (2002) applies practice theory to understand cir-

cultivation and gendered movement of farmers in small-scale landscapes of precolumbian Maya households and their rural surroundings in Belize.

Ethnogeography

The utility of ethnographic discussions of trails, paths, and roads for the interpretation of archaeological evidence is increasingly clear. Not only do these sources provide literal sources for comparison about patterns of movement in different cultural settings, but they also contain considerable information about the significance and perception of such movement from an inside perspective (Abercrombie 1998; Brody 1981; Myers 1986; Nabokov 1981; Parmentier 1987). Ethnographic perspectives on landscapes of movement derive from various perspectives but in particular require working with indigenous concepts of space and place, and thus *ethnogeography* (Fowler, Chapter 5, this volume; Zedefio, Hollenback, and Grinnell, Chapter 6, this volume).

A recent example of the ethnogeographic approach is Stephen Jett's study of Navajo trails at Canyon de Chelly in northeastern Arizona (2001). This research places these features in context, with detailed descriptions of trail fabric and structure seasoned by discussion of the conceptual role of these features in Navajo culture. Such approaches need not be restricted to "non-Western" settings, since in a sense all pasts can be treated ethnographically. For instance, linguistic approaches to Maya roads (Keller, Chapter 7, this volume) are paralleled by work on movement terminology in classical languages. Yannis Lolos has summarized ancient Greek words for roads, paths, and related features, developing a frame of reference that can inform topographic research undertaken on landscapes of movement from that era (2003; Gates 2005a). Echoes of ethnogeography in other works about travel in the pre-modern Old World (e.g., Adams and Laurence 2001; Strassberg 1994) and cross-cultural studies from anthropologists such as Mary Helms (1988) are particularly useful for comparative study.

Other Theoretical Approaches

The utility of studying trails, paths, and roads in archaeological contexts can be seen in the numerous additional theoretical perspectives that have been employed in their interpretation. Such studies have been used as elements of broader cultural-evolutionary arguments, most influentially by Timothy Earle, whose cross-cultural analysis of organization and labor

investment in landscapes of movement is widely cited (1991; Chapter 12, this volume). Carl Lipo and Terry Hunt (2003) analyze the "quarry roads" of Rapa Nui society from a selectionist perspective.

Diverse, "post-processual" viewpoints on trails, paths, and roads are increasingly common. Matthew Campbell argues that the particular significance of the Ara Metua road that once encircled Raratonga was in providing structure to ritual and memory (2006:107). The symbolic role of trails, paths, and roads has been given significance in several recent archaeological interpretations (d. Snead, Chapter 3, this volume). The Chaco roads, which have been argued to primarily serve as a "cosmological" organization of landscape, are a good example (Marshall 1997; Sofaer, Marshall, and Sinclair 1989; Vivian 1997b).

CULTURAL HERITAGE

In the late 20th century, the presence of trails, paths, and roads in cultural landscapes came to the attention of land managers, who then grappled with associated issues of preservation, interpretation, and cultural heritage. Understanding how people moved through the country bears a direct relationship to the role that landscape played in a given social context, which in the modern era is potent information for establishing rights and obligations. Such information can also be culturally sensitive, even proprietary, since in many cases trails, paths, and roads remain in use for ritual practices, as mnemonic devices, and symbols of identity, all evidence that movement continues to be a political act (Ferguson, Berlin, and Kuwanwisiuma, Chapter 2, this volume).

Landscapes of movement have also become an important element of heritage tourism. Some well-known and maintained pathways in the British Isles are based on indigenous tracks, and such historical associations are part of the walker's experience (Johnson 2007). The popularity of initiatives directed at historic routes in North America such as the "National Road" (Raitz 1996) and the Camino Real between Mexico City and Santa Fe, New Mexico (Marshall 1991; Palmer 1993), indicates the public's perception of their importance. Various documentary, commemorative, and interpretive strategies have resulted. Roads were the theme of Kansas archaeology month in 2006, for instance, with associated teaching materials and outreach programs (Irvin and Cooper 2006). Both the Eurasian Silk Road and

the primary Inka roads are the subject of international heritage initiatives (UNESCO 2004; Espinosa 2002).

The challenge with any landscape-oriented interpretive scheme aimed at the public is to establish the web of associations inherent in such a context. The "Santa Fe National Historic Trail" is essentially a network of separate installations dispersed across the Central Plains of the United States, unified (at least in theory) by their historic connectivity (Simmons 2001) but separated by the vast tracts of modern America. Every year thousands of tourists follow the Inka Trail to Machu Picchu and, increasingly, the Imperial Inka road network; but they probably do not envision the trip as it once was, a route lined with estates, administrative centers, waystations, and villages and traveled by messengers and laden llama caravans (Espinosa 2002). Instead, the trip engages the romance of hidden ruins in the jungle and high Andes, certainly an evocative journey but one that evokes European romanticism rather than Inka landscape organization. Ironically, although trails, paths, and roads may be an ideal focus for heritage tourism, the journey still belongs to the one making it rather than to those who passed before.

CONCLUSIONS

One of the principal conclusions of the Penn International Research Symposium on Landscapes of Movement is that archaeological research on trails, paths, and roads is relevant and timely. New tools and methods make such research much more feasible than ever before; innovative theoretical approaches have opened windows for us to comprehend these features in ways that make them meaningful on their own within their original context and to be incorporated into our perceptions of human society at a broader comparative level. Landscape is a liberating strategy, and the chapters in this volume make that case in creative ways.

The authors in this volume argue that the landscape paradigm breaks down artificial barriers between categories of archaeological information, linking research on trails, paths, and roads across regions and continents. Such connections are particularly critical at a time when the features we study face threats from multiple sources, including urban development, energy exploration, and even recreational overuse. Just as archaeologists need to think about what landscapes of movement mean to the people who used

them, so we must also ponder how they can be made meaningful to their modern visitors.

Ultimately field research on landscapes of movement has its own particular appeal, what O. G. S. Crawford once described as the "unalloyed archaeological thrill ... in finding and tracing a new piece of Roman road" (1960:18). Whether or not we can share the experience of the ancestors, walking in their footsteps can be a profound and engaging process. The chapters that follow pay homage to these different ancestors and to our own archaeological predecessors by drawing attention to the real value of trails, paths, and roads to the study of the human past.

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