

Food and Complex Societies

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In complex societies individuals from distinct social, economic, gender, or age groups often consume different foods because of various economic, political, and ideological factors. The food system not only involves what is consumed but includes the labor and technology that goes into the production and preparation of food as well as how certain foods are distributed and eventually discarded. Food systems within and among complex societies are thus tightly intertwined with social differentiation and the political economy and participate in defining and maintaining differential social relations.

KEY WORDS: foodways; paleodiet; consumption; social relations.

INTRODUCTION

Archaeologists have produced significant advances in understanding subsistence—often employing models that focus on population, environment, and technology to predict and explain *general* changes in subsistence through time (e.g., Binford, 1968; Boserup, 1965; Christenson, 1980; Cohen, 1977; Earle, 1980; King, 1993; Morrison, 1994; Sobolik, 1994; Trierwieler, 1990; Wymer, 1993; cf. Browman, 1987; Keene, 1983; O'Connell *et al.*, 1982; Reidhead, 1980). Although these variables are critical in understanding human behavior, the models typically address only a narrow range of the many factors that are encompassed by the study of food. Topics such as origins, adaptation, risk, and cost minimization usually are couched in terms of a normative set of actors—sites, periods, and cultures. As such, the models often do not adequately address how subsistence is affected by individual action (see Brumfiel, 1992). Cost minimization, for example, does not ex-

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plain all behavior, especially in complex societies where subsistence decisions also are based on status and political concerns. Economics is clearly a factor in these decisions, yet for some individuals minimizing cost may not be an issue. Elites may consume expensive resources because they can "afford" them and because the foods—and their consumption—symbolize their wealth and power. Food, thus, incorporates numerous aspects of culture—ranging from technology to nutrition and the symbolic (see Binford, 1962; Goody, 1982; Harris, 1987; Hodder, 1986; Rathje and Schiffer, 1982; Ross, 1987; Schiffer, 1992).

Food is intrinsically social. Indeed, social relations are defined and maintained through food. Food thus should not be analyzed for the sole purpose of describing diet and nutrition (e.g., Brown and Mussell, 1984; Coe, 1994; Douglas, 1971; Douglas, 1984; Farb and Armelagos, 1980; Goode *et al.*, 1984a,b; Mennell, 1985; Ohnuki-Tierney, 1993; Powers and Powers, 1984; Wall, 1994; Weismantel, 1988; Willis, 1990). As Ross (1987, p. 8) points out, "Variation in what people eat reflects substantive variation in status and power and characterizes societies that are internally stratified into rich and poor, sick and healthy, developed and underdeveloped, overfed and undernourished." A meal, whether a shared morning tortilla or a formal dinner party, is an event that develops and maintains affiliations among participants and nonparticipants, as well as preparers and consumers. Foodways also change through time and the changes may vary among individuals of differing status, occupation, gender, and age. Indeed, the study of these changes will inform us about general causes of social change.

Recently, archaeologists have contemplated social relations and symbolism through the detailed study of food (see examples below). Typically, these are fine-grained approaches that accept the existence of economic, political, and ideological variation within societies and even variation within households such that males may eat differently than females. This variation is especially vital in understanding complex societies because these societies are organized around a regional political economy where there is differential access to goods, wealth, power, and the means of production. As such, complex societies are composed of hierarchically and heterarchically ranked individuals with marked variation in terms of their needs, wants, and abilities to fulfill their goals (e.g., Ehrenreich *et al.*, 1995; Johnson and Earle, 1987; Redman, 1978; Yoffee, 1993).

The nature of complex societies creates an extremely elaborate food system—the set of conditions under which food is produced and distributed, prepared and consumed, and finally, discarded (e.g., Bowen, 1992; Goody, 1982; Holt, 1991; Huelsbeck, 1991; Johannessen, 1993; LaBianca, 1991; Powers and Powers, 1984; Whitehead, 1984). In complex societies, food is often produced and prepared outside of the household and distributed to

nonproducers. Specialists, for instance, may produce and cook food for other individuals who may be served in various ways, ranging from individual meals to feasts involving many guests. In addition, the food often is differentially allocated to various groups. Elites or commoners, for instance, may receive certain types and portions of food that are important in defining their status. Food distribution also may be regulated through bureaucratic and administrative offices—often through a market system. Consumption involves not only the food itself, but the social context in which the meal is served. Different foods often are consumed by individuals with distinct statuses and roles and are important in defining and maintaining their social positions. Finally, leftovers and the residues of production and consumption are discarded. The rules for disposal, such as the disposal location, may indicate how space is viewed. By inquiring into these components of the food system, from production to disposal, the interrelated aspects of food and culture can be explored—Who are the producers and consumers? Who cooks for whom? Who consumes what? Where are specific foods disposed? and How are food preparation and distribution delineated across ethnic, class, gender, and generational boundaries?

In this article, I first present an introduction to various theoretical aspects of food and social relations. I believe that, as anthropologists, it is our primary goal to understand human behavior (see Skibo *et al.*, 1995). Behavior involving food is affected by a variety of interrelated factors, including the environment, economics, social organization, belief systems, and even evolutionary fitness. Instead of reviewing all anthropological approaches concerned with food, I have focused on the social and symbolic components. This is not to say that the ecological, environmental, and nutritional aspects that archaeologists have traditionally followed are not critical to understanding food. Rather, it is necessary to build upon these advances by focusing on the social and symbolic elements of the food system. We therefore gain comprehensive insights into many aspects of culture—not solely subsistence.

Following the discussion of food and social relations, I address some general methodological issues within the context of the food system, including the production, preparation, distribution, consumption, and disposal of food. Then using a variety of examples, with a particular emphasis on complex societies, I demonstrate how the food system can be analyzed with a concern toward understanding the social and symbolic aspects of food. As such, this review presents a recipe—the food system—that archaeologists can follow, modify, and expand if they are interested in consuming the social and symbolic aspects of food and complex societies.

FOOD AND SOCIAL RELATIONS

Cultural anthropologists have a long tradition of studying the social and symbolic roles of food. Early research focused on food taboos and sacrifices, often emphasizing the religious aspects of food (Frazer, 1907; Smith, 1889). This interest later turned to the functional aspects of food, particularly the value of food in developing and maintaining social relations. Radcliffe-Brown (1922, p. 270) viewed food as a means of regulating the social system. He focused on rituals involving food, stressing the social function rather than the religious event. Although interested in nutrition, Richards (1932, 1939) also emphasized the functional aspects of food by exploring how food expresses and symbolizes social relationships: "The whole social organization is held together very largely by the strength of these nutritive ties, and if we divorce the economic activities of food-getting from the study of man's physiological needs and appetites, we shall fail to understand the nature of society itself" (Richards 1932, p. 15).

Levi-Strauss' (1963, 1966) structural focus propelled the emphasis away from how food serves in social relations toward a means of analyzing the structure of a society. Using a linguistic model, he developed the culinary triangle, which modeled the transformation of food from raw to cooked to rotten. The triangle was elaborated upon by adding various agents (air, oil, and water) and cooking techniques (broiling, boiling, roasting, and frying). Levi-Strauss (1966, p. 595) was attempting to find underlying constants in order "to discover for each specific case how the cooking of a society is a language in which it unconsciously translates its structure." His approach compared associations and oppositions from the culinary subsystem to other subsystems (e.g., economic, kinship, myth, and ritual), revealing the underlying structure of a culture. The model was tested cross-culturally by Lehrer (1972). She modified Levi-Strauss' model by adding components such as seasonings, thoroughness of cooking, utensils used, and different terms for animal and plant processing. Lehrer concluded that the culinary triangle had less to do with the underlying structure of a culture than with available materials and techniques and thus serves better to describe a culinary system.

Regardless of whether the culinary triangle provides a universal structure (see Douglas, 1971, p. 32; Mennell, 1985), cooking and eating practices are structured. Culinary rules are shared ways of preparing and eating food that are socially patterned. The rules guide behavior. They are socially learned and shaped—often transmitted through familial relations (e.g., mother to daughter) and various other social networks. This results in a shared food system within bounded groups (e.g., Goode *et al.*, 1984 a,b; Mennell, 1985; Weismantel, 1988). There are, for instance, shared rules for

preparing and mixing ingredients, methods of cooking, and serving individuals. As an example, many different ethnic groups use tomato-based sauces. Italian-American cuisine, however, is defined not so much by the tomatoes but by the method of preparing the sauce—especially the use of certain spices and other ingredients (Goode et al., 1984a,b).

Food systems also change through time. As Weismantel (1988, p. 23) noted, “The structures of cuisine are not fixed and immutable, but are in a constant state of transformation.” Changing rules for cooking and eating need explanation. We must therefore understand the history and development of the food system. How did the food system change through time, and what are the processes that account for the changes (Mennell, 1985, p. 16)? Furthermore, culinary rules are not always followed and not all members of a society follow the same rules. This is especially true in complex societies where different culinary rules often correspond to class, gender, age, and occupation. An approach that accounts for diverse foodways is preferable because standard structural approaches often mask important variation among different individuals and groups within a society (e.g., Goody, 1982; Mennell, 1985). As such, we will not “neglect those important aspects of that culture that are linked with social or individual differences” (Goody, 1982, p. 28).

Food and cooking not only provide calories from available resources, but are *actively* involved in participating in and defining social relations. As Hodder (1986, p. 6) states about material culture, food symbolism “. . . does not passively *reflect* society—rather, it creates society through the actions of individuals” (italics in original). A certain way of preparing a food item, for example, may symbolize ethnic, class, or gender identity and thereby actively delineate the status and role of the subgroup. The active role of food is clearly demonstrated by Sidney Mintz’s (1979, 1985) study of sugar. Sugar was one of the first commodities to be mass advertised and its production was critical in the development of the slave trade. Its production and consumption, thus, had powerful effects on various economic, social, and political institutions during the eighteenth and nineteenth centuries.

By analyzing structure and symbolism we see that food is vital in defining everyday social relations. It thus seems appropriate that we can build upon earlier subsistence studies by emphasizing the social and symbolic aspects of food. Such an approach leads to an enriched understanding of the inner workings of complex societies.

Methodological Considerations

To understand food and social relations in complex societies, data obviously need to be collected and analyzed in a manner that reflects the

internal variation within a society (Deetz, 1982; Schiffer, 1975; Wilk and Rathje, 1982). Most contemporary archaeological research includes systematic recovery of floral and faunal remains from household contexts. By sampling and analyzing various contexts, dietary variation can be examined between elites and commoners, males and females, and old and young (e.g., Hastorf, 1991; Lennstrom, 1992; Lennstrom and Hastorf, 1992, 1995; Pearsall, 1989; Toll, 1988). Furthermore, through skeletal analyses we can study the consumption patterns of individuals (see below). As such, a concern with “internally differentiated cuisines” (Goody, 1982, p. 38) is necessary where food is explored at the household level. It thus becomes possible to approach subjects such as class, gender, and age in relation to food.

Status may be defined through architectural and artifactual analyses. Food remains then can be considered in light of the different social strata. Gender may be identified by examining gendered activity areas within households (e.g., Brumfiel, 1992; Ehrenberg, 1989; Gero and Conkey, 1991; Gibbs, 1987; Gifford-Gonzales, 1993; Hastorf, 1991; Reynolds, 1986; Wylie, 1992). Data on gender and generational subsistence also can be collected through stomach contents, coprolite analyses (Gremillion and Sobolik, 1996; Reinhard and Bryant, 1992), and bone chemistry (e.g., Brown, 1981; Bumsted, 1985; DeNiro, 1987; DeNiro and Hastorf, 1985; Hastorf, 1991; Larsen, 1987; Pate, 1994; Powell, 1991; Price, 1989a; Price *et al.*, 1985; Sandford, 1993; Saunders and Katzenberg, 1992; Sobolik, 1994; van der Merwe and Vogel, 1978; Verano and Ubelaker, 1992).

Social variation is also important for understanding food symbolism because various groups—ethnic, status, or gender—may view foods in distinct ways. Contextual, structural, and symbolic approaches offer important avenues for examining the active role of food. Clues concerning the meaning of food to a society or group of individuals can be discerned through contextual associations and ethnohistoric and ethnographic analogy. The context of food preparation, consumption, and discard, as well as artifactual associations, may provide possible interpretations about food symbolism (e.g., Douglas, 1990; Hodder, 1982a, b, 1986, 1987a; Marcus and Flannery, 1994; McGhee, 1977; Renfrew, 1994). Associations across various types of data—spatial, temporal, depositional, and typological—can lead to understanding symbolic meaning (Hodder, 1987b). What are the food items associated with? Are certain foods associated with certain locations (e.g., domestic or ritual), artifacts, or activities? An understanding of the patterns that are observed and their systemic context may suggest how foods symbolically operate within a complex society.

Other possibilities for interpreting symbolic meaning include the analysis of writing systems and iconography. For those complex societies with written language, analysis can focus on the relationships between language

and food (e.g., Baines, 1988; Killen, 1994; Schele and Freidel, 1990; Taube, 1989). In what context is the word for a certain food used? What cognates exist for the word? How are specific animals or plants referred to in myths? In ritual? The word used for a certain food item and its method of preparation are data that can be evaluated in terms of food symbolism. In a similar way, iconographic depictions may also play a critical role in interpreting prehistoric food symbolism (Benson, 1972; Donnan, 1978, 1982; Freidel, 1992; Holt, 1996; Lathrap, 1985; Miller and Burger, 1995; Morphy, 1989; Paul, 1990; Pohl, 1981; Schele and Miller, 1986; Taube, 1989). We might ask, what kinds of plants and animals are depicted on what artifacts and in what locations? Are there associations with other items or beings? Are they anthropomorphized? The study of language and art, articulated with an analysis of floral and faunal remains, presents an opportunity to explore food metaphors and symbolism.

Ethnohistoric and ethnographic analogy also can be valid tools for interpreting food symbolism (e.g., Douglas, 1990; Hill, 1994; Hodder, 1986; Marcus, 1982; Marcus and Flannery, 1978, 1994; McGhee, 1977; Pohl, 1981, 1985; Saunders, 1990; Stark, 1993; Whitley, 1994; Willis, 1990; Zuidema, 1983). In some instances, these data can be used as analogies to postulate prehistoric foodways. The everyday use of foods, their use in rituals, feasts, language, and myths, provides interpretable evidence for food symbolism. Language, for instance, is a symbolic system and the analysis of, for example, myths and cognates, may provide data on what a particular food item might mean to a certain group (e.g., Farb and Armelagos, 1980; Fowler, 1972; Marcus, 1982; Saunders, 1990; Whitley, 1994). Among the Yukatek Maya, for instance, maize was synonymous with God (Farriss, 1984; Freidel *et al.*, 1993, p. 55) and in Mayan myths it is also associated with jade (Boherer, 1994; Thompson, 1954, p. 237), demonstrating its divine and precious nature.

Of course, like any other aspect of archaeology, the details of symbolism need to be examined rigorously within a scientific framework (e.g., Gibbon, 1989; Hanen and Kelley, 1989; Hill, 1994; Hodder, 1986; Renfrew, 1994; Stark, 1993; Whitley, 1992). Through a combination of deductive and inductive reasoning, alternative hypotheses need to be evaluated using multiple lines of evidence—context, associations, and links to ethnography and ethnohistory—to produce reliable interpretations. As Barker and Gamble (1985, p. 11) assert, “Rigorous contextual analysis and adequate sampling are clearly essential prerequisites for any realistic assessment of the likely relationship between residues from complex sites and the behaviour of the inhabitants . . .”

Clearly, not all patterns observed in the archaeological record are the result of human behavior and careful consideration must be given to the

noncultural as well as the cultural processes that affect the archaeological record (Schiffer, 1972, 1987). Our interpretations must therefore be based on analyses of depositional context (e.g., primary and secondary), sample size, and differential preservation (Barker and Gamble, 1985; Ford, 1979; Gifford, 1981; Gilbert and Singer, 1982; Gordon, 1993; Klein and Cruz-Uribe, 1984; Lyman, 1982, 1987, 1994; Maltby, 1985; Miksicek, 1987; Pearsall, 1988; Schiffer, 1987). A secondary refuse deposit, for instance, often represents a variety of activities—from preparation to cooking to consumption and even nonfood activities (Maltby, 1985; Miksicek, 1987). In contrast, a primary deposit on a kitchen floor may indicate food preparation (e.g., Hastorf 1988). Sampling strategies, including the context and the size of the sample, will also effect interpretations of diversity and comparisons between various units (e.g., Cruz-Uribe, 1988; Gordon, 1993; Grayson, 1979; Lennstrom and Hastorf, 1992; Leonard and Jones, 1989; Pearsall, 1989). It is necessary to be more than simply cognizant of issues surrounding formation processes and sampling. They explicitly need to be factored into our research designs, analyses, and interpretations. Ethnoarchaeology and experimental archaeology obviously have the potential for modeling these processes through the examination of discard, preservation, alterations, and so forth (e.g., Binford, 1981; Gifford, 1977; Gifford-Gonzales, 1993; Hayden and Cannon, 1983; Hudson, 1993; King, 1994; Kramer, 1982; Maltby, 1985; Miksicek, 1987; Moore, 1981; Skibo, 1992, 1994; Stark, 1993; Staski and Sutro, 1991a; Yellen, 1977).

We can better appreciate the roles of food in complex societies through an understanding of cultural and natural formation processes. The patterns resulting from human action can be analyzed in a detailed manner and are viewed here as actively participating in the development and maintenance of social relations. Archaeologists have the ability to detect variation in diet and can use contextual associations, language, iconography, ethnography, and ethnohistory to provide details concerning the symbolic nature of food. Through such concerns we can promote an understanding of the various roles food played in the past. While considering these methodological issues, a fruitful analysis of food and culture can focus on the food system from production to final disposal.

Production and Preparation

Many recent archaeological studies explore the effects of diverse production and preparation strategies on foodways and culture. The production and preparation of food in complex societies are often elaborate processes oriented toward fulfilling a variety of interests, wants, and needs

that are dictated by a number of factors, including supply and demand, as well as regulations by governing bureaucracies. The study of food thus should incorporate not only what is produced and where it is produced but also who produces and prepares it. Subsistence labor typically fulfills the producer's needs, but often, especially in complex societies, the producer is not the consumer (Crabtree, 1990). It is therefore important to understand how tasks are divided among the labor force through age, gender, and specialization. The interactions between producer and consumer thus not only inform about diet, but provide insights into the social organization of production. Also critical in understanding production are the available technology and the quantity and quality of food produced as well as the availability of productive resources, such as land, water, and fertilizer (Goody, 1982, p. 44).

Food production and preparation activities typically are identified through the contextual distribution of floral and faunal remains. The frequency of weeds and crop by-products (e.g., chaff and spikelets) relative to crops indicate the types of processing performed (e.g., cleaning, winnowing, parching, and storage) (Dennell, 1972, 1976, 1979; Green, 1981; Hillman, 1973, 1981, 1984; Jones, 1984, 1985; Schiffer, 1975; Sikkink, 1988; Welsh and Scarry, 1995). The context of the plant remains also distinguishes among processing, cooking, and consumption activities (Dennell, 1972; Hastorf, 1988, 1991; Lennstrom, 1992). Similarly, the distribution of faunal remains often is indicative of food production and preparation activities. In the Near Eastern Byzantine village of Qasrin, areas of food preparation were inferred based on the frequency and distribution of various animal body parts and a comparison to a modern Druze village in the Golan Heights. Using these faunal data, the researchers also were able to distinguish between domestic and nondomestic contexts (Grantham and Hesse, 1991).

Not only are animals used for food, but their "secondary products," such as milk, hide, and wool, as well as their use as draft animals, are critical to the operation of a society and often influence production strategies (Sherratt, 1981, 1983; cf. Halstead, 1986). Harvest profiles from two Anglo-Saxon sites in West Suffolk England document a shift in the use of sheep for meat to the production of wool. Sheep during the earlier occupations were killed primarily in the first 2 years, indicating production for meat. Because there was a shift toward wool production, the later occupation contained higher frequencies of older sheep (4–8 years). This change in production strategies during the Middle Anglo-Saxon Period is linked to the development of complex societies with market economies (Crabtree, 1991, 1996). In Mesopotamia, Galvin (1987) demonstrates a similar shift in animal production culminating in specialized livestock production oriented for exchange in the market.

The amount of productive land available to certain groups within a complex society is often instrumental in the construction and maintenance of power relations (e.g., Harvey, 1984, 1991; Hicks, 1984, 1991). In Hick's (1991) discussion of Aztec surplus, ethnohistorical and archaeological evidence suggests that the small size of plots worked by peasants was the minimum amount necessary for subsistence, whereas large estates were controlled by the elite and produced a surplus. Power was manifested in the individuals with large landholdings through their control of surplus and by minimizing the size of peasant plots. Other studies in the Valley of Mexico further document how, over time, agricultural land was controlled. Referring to the city of Teotihuacan, Parsons (1991, p. 36) states, ". . . The city appears to have fed itself in a very direct fashion, with firm and immediate control over both the agricultural land and the agricultural laborers that most directly affected its subsistence base." Later, agriculture focused on *chinampa* or raised field agriculture to produce a surplus necessary for maintaining power among the populations in the Aztec capital of Tenochtitlan (Brumfiel, 1991a, b; Parsons, 1991). These studies suggest that, within complex societies, agricultural production is an important aspect in forming and maintaining power relations.

Other recent archaeological research investigates how the production of food symbolizes ethnicity, social status, and gender relations. By examining the archaeological record, ethnography, and history, Yentsch (1992) demonstrated that African-American ethnicity was defined, in part, through fishing. Slaves at the Calvert site adapted West African fishing methods to the Chesapeake, thereby maintaining their heritage in such a way that a caught fish was a symbol of their accomplishment.

A detailed understanding of the social organization of production can be realized by studying division of labor and changing work patterns between males and females (e.g., Brumfiel, 1991b; Goheen, 1996). Among the prehistoric Maya, female productive activities were critical to the economy. Livestock production, especially dogs and fowl, were essential components to rituals, celebrations, barter, and tribute (Pohl and Feldman, 1982). In the Mantaro Valley of Peru, the production and consumption of maize beer actively reinforced dominant gender relations (Hastorf, 1991). Hastorf's (1991) insightful study utilized macrobotanical, isotopic, and ethnohistoric data to suggest that differential access to maize and its associated symbolism played an active role in constructing relations between males and females. "Women became the focus of tensions as they produced more [maize] beer while at the same time they were more restricted in their participation in society . . . [and their] political position diminished" (Hastorf, 1991, p. 152).

Children also play a very important role in food production and preparation (e.g., Hawkes *et al.*, 1995; Kehoe, 1978). In complex societies parents may be specialists who lack time for producing subsistence goods. The productive roles of children therefore are often critical in obtaining food. Division of labor thus is important in terms of how specialists meet their subsistence needs. Full-time specialists, for instance, are unable to produce subsistence goods and may rely on kin, staple finance (staples provided by institutions to support their activities), or markets to provide food (see below) (Gumerman, 1991, 1994a).

Understanding food production and social relations has been expanded by archaeological approaches that utilize Levi-Strauss' (1963, 1966) ideas of transformation and opposition. Many of these approaches examined the relationship between nature and culture. A common theme is the transformation of food from its natural or wild form to a more cultural state. Hastorf and Johannessen (1993), for example, show that the importance of *chicha* or maize beer in Andean societies relates in part to the fact that in the Andes there are no wild counterparts of maize. It is the ultimate transformed crop. In addition, the process of producing (transforming) maize into an alcoholic beverage is very elaborate and there also is a significant transformation that occurs to the imbiber.

In a similar vein, Lennstrom's (1992) research in the Mantaro Valley of Peru examined changes in the contextual distribution of wild plants. Her analysis indicates that an increase in the frequency of wild plants within house compounds through time may reflect a change in the perception of wild and domestic space. Increasing agricultural production transformed the surrounding environment from a more wild state into a cultural landscape that may have affected how interior space was viewed.

In terms of food preparation, analyses should examine the labor that goes into processing and cooking, including who cooks for whom as well as the technology of cooking (hearths, containers, and kitchens) (Cowan, 1983; de la Pena Brown, 1983; Goody, 1982; Levi-Strauss, 1963, 1966; Mennell, 1985; Stahl, 1991; Whitehead, 1984; Williams, 1984). Cooking vessels, for instance, may denote specific food preparation techniques. Variation in ceramics, among groups and through time, may illustrate transformations in foodways (Johannessen, 1993; Welsh and Scarry, 1995; cf. Hawkins, 1992).

Often the method of preparation, rather than the specific food item, is critical in defining distinct foodways (Goode *et al.*, 1984a). "Methods of preparation include rules for segregating or mixing elements, the medium used for cooking, the type of heat application, the way items are cleaned and cut, and spices or flavoring used" (Goode *et al.*, 1984a, p. 148). Maize, for instance, is prepared much differently in Mesoamerica than in the Andes. Tortillas, one primary symbol of Mesoamerican foodways, are not made

in the Andes, where maize is mostly boiled, roasted, or turned into an alcoholic beverage. Butchery practices may also define ethnicity. Following Binford (1978) and Yellen (1977), Lyman (1987, pp. 288–289; italics in original) suggests “. . . that animals are butchered according to a set of rules that differs from culture to culture *and* from natural setting to natural setting . . .” Butchery practices thus may vary between groups, where a certain cut of meat may represent group identity.

In complex societies, butchery may be regulated by state institutions (Maltby, 1985; Zeder, 1988, 1991). Near the center of the Roman town of Cirencester (Gloucestershire), specific butchering activities were identified. Cattle dominated the assemblage where “. . . large-scale processing of cattle carcasses in the Roman period can leave quite distinct and spatially separate accumulations of bones” (Maltby, 1985, p. 53). They were processed in a specialized manner, suggesting the possibility that the meat was sold at the forum. In southwest highland Iran, administrative control over food preparation was examined through the chemical analysis of clay seals and by comparing faunal remains from a public building and an institutional kitchen. The development of a specialized urban economy resulted in food processing that was tightly controlled and localized (Blackman and Zeder, 1986). Earlier occupations contained a variety of species, ages, and cuts of meat, suggesting that the animals were produced by the consumers or were directly procured from the producers. Later, there were fewer species (mostly sheep and goat), age was restricted to 2 and 3 year olds, and the cuts of meat were standardized. Butchery, thus, was regulated and meat was likely procured indirectly, probably through the state (Zeder, 1988, 1991).

Food preparation in complex societies often takes place outside the household and involves preparation by specialists for non-food-producing individuals who may be served individually, at banquets, feasts, or even restaurants (see Chang, 1977; Goody, 1982; Mennell, 1985). Inca cooks and brewers, for instance, prepared food for feasts used by the state to reciprocate the labor provided by commoners. This system was crucial in sustaining political, hierarchical, and gender relationships within the state (Hastorf and Johannessen, 1993; Morris, 1974; Morris and Thompson, 1985; Murra, 1960).

A clearer, more detailed comprehension of the diverse organizational strategies common to complex societies is gained through research that focuses on individuals interacting within groups. Subsistence practices vary within complex societies because different people employ diverse production and preparation strategies. At one extreme there is self-sufficiency where families produce and prepare their own food. Yet within households there is no equality—some individuals rely on the labor of others to provide meals, which may cause variation in diet and clearly nurtures gender and

age relations. At the opposite end of household self-sufficiency are individuals who rely exclusively on food produced and prepared by others outside the household. Again, this causes subsistence variation within that society and reinforces social differences. Various production and preparation strategies therefore affect not only what is consumed but also the negotiation of power and control between producers and consumers.

Distribution

Food distribution in complex societies is often an elaborate process and is closely related to a society's political and economic organization. Food often is allocated through gifts, reciprocal exchange, feasts, festivals, markets, and obligatory transfer (Goody, 1982; Maltby, 1985). This distribution is rarely equal, especially in complex societies, and therefore differential allocation may be understood by focusing on how food is distributed, by whom, and to whom.

Food often is differentially allocated among various segments of a society. Different types of food, for example, are often segregated between elites and commoners because they have diverse means of procuring subsistence resources (see Crabtree, 1990; Hastorf, 1988, 1990, 1991, 1993; Holt, 1991; Ives, 1988; Miller and Burger, 1995; Reid, 1996; Welsh and Scarry, 1995; Zeder, 1991; cf. Bowen, 1992; Powell, 1991; Reitz, 1987; Reitz *et al.*, 1985). Among the prehistoric Maya, several research projects demonstrate that various foods were associated with different economic classes. In many cases, mammals, especially dog and deer but also peccary, dominate the elite faunal assemblage and elites also apparently had greater access to tree fruits (Carr, 1985; Crane and Carr, 1994; Pohl, 1985). At the sites of Cerros and Copan, data suggest that elites were allocated a greater diversity of food. Nonelites at Cerros apparently utilized more food from aquatic habitats, especially marine environments (Crane and Carr, 1994; Lentz, 1991).

In coastal Peru, data suggest that elites had access to and consumed costly resources such as llama, chile pepper, and coca. In contrast, commoners used more opportunistic resources, such as wild plants and shellfish (Gumerman, 1991, 1994a, c). Commoners, who were likely agricultural laborers, had access to wild plants that grew in fields and along irrigation canals. Commoners thus utilized a different set of foods than elites, who could afford the more costly goods. The distribution of the various foods likely symbolized, and thus supported, the social positions of the different groups. Llamas, for example, were abundant in elite contexts, they were sacrificed and buried, they produced valuable wool, they were depicted

iconographically and ethnohistorically in numerous Andean rituals, and they were expensive for coastal populations to maintain (Flannery *et al.*, 1989; Gilmore, 1950; Gumerman, 1991, 1994a, c; Miller and Burger, 1995; Shimada and Shimada, 1985, 1987; Topic *et al.*, 1987; Tschopik, 1946). Subsistence variation within a complex society therefore results from the differential effects of cost, accessibility, controllability, and the cultural value of a resource (Gumerman, 1991, 1994a).

Although food is often distributed differentially among various groups within a society, it is also possible that differences in social status are not reflected in diet (Powell, 1991; Reitz, 1987; Reitz *et al.*, 1985). Markets and their bureaucratic regulation, for instance, may cause a leveling of foodways across status groups and contribute to a less diverse array of goods, cuts of meat, and ages of animals being distributed (Goode *et al.*, 1984b; Maltby, 1985; Rothschild, 1989; Zeder, 1991). In comparing 19th century New England faunal assemblages between an upper middle-class white household and an African meeting house, Bowen (1992) suggests that diets were similar because the market system regulated butchery and the cuts of meat sold. The use of a market (depending on the scale and location), however, also may contribute to subsistence diversity, because exotic and expensive resources may enter the diet of those who can afford them (Gumerman, 1994a; Mennell, 1985).

Gender relations may be an important factor affecting the distribution of food within households. Clearly, "family relationships are not built upon identical rights and duties but upon reciprocal rights and duties; these roles often involve relations of marked dominance and subordination which allow some individuals to benefit from the labor of others" (Weismantel, 1988, p. 26). Hastorf (1991) aptly demonstrated that changing gender relations in the Mantaro Valley of Peru were responsible for variation in food distribution between males and females. The conquest of the local population by the Inca empire reorganized the economy, causing changes in the distribution of food. Some males were apparently working for the state, which caused an increase in their maize consumption because the state distributed maize, including maize beer, through feasting. This example illustrates that, to understand food distribution, it is important to examine the various attributes of the food itself. Maize, for instance, has certain features that made it an ideal staple finance food among Andean and Mesoamerican state societies; it is productive and an excellent storable resource that is compact and very transportable. It was therefore used by these societies to sustain non-food producers, such as administrators, warriors, and laborers (Gumerman, 1994b; Johannessen and Hastorf, 1994).

Other research concerned with distribution investigates how and why certain subsistence resources are obtained and consumed by specialists.

Crabtree (1990, 1996) examines this issue when she asks how nonhunters procure meat products in complex societies. By examining kill patterns, sex ratios, body part distributions, and the range and importance of species present, we can explore the detailed relationships between producers and consumers. Specialization also was examined on the north coast of Peru, where various foods were consumed depending on the intensity and degree of specialized activities. Full-time specialists attached to elites were distributed more staple finance food, such as maize, because they had little time to produce their own food and were often sustained by the elites they served. Part-time specialists who were independent consumed more opportunistic foods—foods that they obtained themselves or had family members procure (Gumerman, 1994a).

It is clear from these diverse analyses that in complex societies gender, stratification, and specialization are important factors affecting the distribution of certain resources. This, of course, is obvious; yet most archaeological research, until recently, has ignored this variation. Depending on the resource, its attributes, and the method of distribution, various individuals may receive differing quantities and portions because of social, economic, political, and ideological variation. The distribution, however, is not passive but actively symbolizes the social differences between groups and is used to develop and maintain the assorted relationships common to complex societies.

Consumption

The consumption of food involves not only what is eaten, but the gathering and serving of the participants as well as the clearing away of the meal (Goody, 1982). As such, the participation or nonparticipation in a meal and the location of the event often affect the contents and help establish and maintain social relations while imbuing the food and occasion with symbolic meaning. This is apparent in Weismantel's (1988, 1989a, b, 1991a, b) ethnographic research in highland Ecuador:

For the Zumbagua household, the meal represents many things: both articulation with the outside world and the household's own internal integrity; the subordination of female to male and yet a locus of feminine power within the family; the product of work transformed into the satisfaction of desire, and the proof of the household's ability to survive and to reproduce itself. (Weismantel, 1988, p. 29)

Clearly, there is much more to understanding consumption than the actual caloric value of the food itself. The type of meal consumed (e.g., daily meals, snacks, and feasts) and its structure, manners, and technology (containers, utensils, tables, etc.) also are critical in terms of understanding the

relationship between food and culture (Goody, 1982). Serving and eating vessels, for instance, can be studied in terms of food consumption (Blinman, 1989; Blitz, 1993; Costin and Earle, 1989; DeBoer and Lathrap, 1979; Heron and Evershed, 1993; Johannessen, 1993; Reents-Budet, 1994; Skibo, 1992; Welsh and Scarry, 1995). Do different groups use different containers? Do ceramics change through time and does this represent a change in foodways? We thus can go beyond time-space systematics by orienting our attention toward food consumption and social relations.

Specific food items often are significant in understanding social relations—such as the consumption of dog by the Oglala (e.g., Powers and Powers, 1984). Yet the social significance placed on recipes, the structure of meals, and meal cycles (the patterning of meals in a temporal and seasonal framework) is usually more important than the actual food item (e.g., Douglas, 1971, 1984; Goode *et al.*, 1984a, b). Menu negotiation takes the analysis of food a step further by addressing the decision-making process involved in the content of meals and their format. Rules concerning food are shared by groups, but these rules interact with a variety of external factors, such as time, money, and personal preference, to create the actual meal (Goode *et al.*, 1984a).

Individual meals are difficult for the archaeologist to recover, except in cases such as the intestinal contents of mummies and from coprolites (e.g., Bryant, 1974; Callen, 1963; Reinhard and Bryant, 1992). Archaeologically derived subsistence data typically are aggregated, such as the seeds from a number of flotation samples or stable isotope data. By analyzing the aggregated household data we can detect overall consumption patterns among the various groups within a society (e.g., status or gender). This also provides larger, more reliable samples that may disclose significant variation. The significance of the long-term pattern is confirmed by Goode *et al.* (1984b, p. 73), where they “emphasize the importance of looking at the food system holistically The patterns which emerged . . . would have been missed if we had only sampled meals, days, or even weeks.” The long-term patterns that archaeologists examine thus may provide a realistic assessment of food consumption and menu negotiation—we must, however, focus on the household.

Hastorf (1988) effectively argues that archaeologists, while often claiming to examine consumption data, usually are exploring production and processing (see also Dennell, 1976, 1979; Hillman, 1973, 1984). Floral and faunal remains typically are recovered in contexts where food is processed and prepared (e.g., the hearth or kitchen floor) and discarded (e.g., middens and fill). To examine consumption, archaeologists should focus on data that provide direct evidence of consumption, such as skeletal analysis (e.g., Brown, 1981; Bumsted, 1985; DeNiro, 1987; Larsen, 1987; Pate, 1994; Price,

1989a; Price *et al.*, 1985; Sandford, 1993; Saunders and Katzenberg, 1992; Sobolik, 1994; van der Merwe and Vogel, 1978; Verano and Ubelaker, 1992), coprolites (e.g., Bryant, 1974; Callen, 1963; Reinhard and Bryant, 1992), and contexts in which food is consumed (e.g., Hastorf, 1988; Lennstrom, 1992; Pearsall, 1988).

Skeletal analyses offer some of the best opportunities for studying consumption among diverse groups of individuals. Variation in diet, nutrition, health, and disease can be investigated using metric analyses, paleopathologies, and bone chemistry. Status differences, for example, were apparently reflected in the strontium levels of bones from the Mesoamerican site of Chalcatzingo, where higher ranked individuals likely consumed more meat than commoners (Schoeninger, 1979). Along the north coast of Peru, paleopathologies changed through time with respect to status. Earlier populations showed minimal health problems, whereas populations during the Late Intermediate Period demonstrated health differences between elites and commoners, with nonelites exhibiting more dietary stress (Verano, 1992). In contrast, a variety of chemical studies among complex societies in the Eastern Woodlands suggests that, at some sites, status did not greatly affect diet (Brown and Blakely, 1985; Blakely and Beck, 1981; Lambert *et al.*, 1979). At the Dallas site in Tennessee, however, elite diet apparently was more balanced and included more iron and protein than commoner diet (Hatch and Geidel, 1985). Although few specifics are mentioned, Buikstra (1992, p. 97) suggests that social and political factors—not just diet—influenced variation in nutrition and disease among Mississippian agriculturalists. She noted “. . . severe ill health . . . including elevated rates of porotic hyperostosis, osteoarthritis, infectious lesions, bone fractures, and developmental dental defects” Rather than solely the result of increases in maize consumption, these problems likely were due to changes in social and political complexity.

Skeletal analyses also provide a valuable means of examining consumption differences among groups of individuals of varying gender and age. Although the number of individuals sampled was extremely small, isotopic data from the north coast of Peru may indicate that males had a more varied diet than females (Ericson *et al.*, 1989). As discussed above, Hastorf (1991) suggested that maize was differentially distributed by the Inca state between males and females, resulting in differing bone chemistry. Dietary differences also were apparent at several Eastern Woodland sites between males and females. Based on an analysis of trace elements (Sr, Zn, and Ca) at Ledders in Illinois, “. . . Late Woodland males may have had disproportionate access to animal protein, or perhaps nuts or legumes” (Buikstra *et al.*, 1989, p. 161) and some age differences in diet were apparent (Beck, 1985; Lambert *et al.*, 1979). Similar gender and age variation was

also observed at the Dallas site (Hatch and Geidel, 1985). Along the southeastern Atlantic coast, Contact Period males manifested higher frequencies of periostitis (pathologies resulting from infection and trauma) compared to females. Health declined in general for southeastern Native populations following Spanish contact. Based on bone chemistry (carbon and nitrogen stable isotopes) and pathologies (osteoarthritis, dental caries, porotic hyperostosis, and enamel hypoplasia), there was a reduction in dietary quality with an increase in maize consumption and a narrowing of dietary breadth (Larsen and Harn, 1994; Larsen *et al.*, 1992).

Pathologies and bone chemistry that reflect diet clearly are some of the best data to examine consumption patterns and social relations. As a cautionary note, however, "too little is known at present regarding the sources of variation in the composition of contemporary human bone. While it is clear that diet is a major contributor, other biological and natural factors are also important" (Price *et al.*, 1989, p. 251). Diet, thus, is not the only factor affecting bone chemistry. Variation is caused by formation processes (i.e., geochemistry), age, gender (including reproductive status, pregnancy, and lactation), and the type of bone tissue sampled (e.g., Buikstra *et al.*, 1989; Bumsted, 1985; Jackes, 1993; Lambert *et al.*, 1985; Pate and Brown, 1985; Price, 1989b; Price *et al.*, 1989; Sandford, 1993; Wood *et al.*, 1992). It is therefore critical that the various factors involved in the formation and transformation of human bone are examined when making conclusions about diet.

Besides the knowledge acquired from skeletal studies, excellent consumption data also are derived from the analysis of coprolites (Bryant, 1974; Callen, 1963; Reinhard and Bryant, 1992). Coprolites consist of several consecutive meals and thus provide strong evidence for the kinds of meals consumed by an individual. Recent research suggests that DNA and hormones can reveal the gender of the person who produced the coprolite (Sutton *et al.*, 1996; Sobolik *et al.*, 1996). The intestinal contents of mummies, where the age and sex of the individual are known, also can be examined (Reinhard and Bryant, 1992). Intestinal contents, coupled with bone chemistry, provide an illuminating view into an individual's diet—from the individual meal to an accumulation of a life of meals (Reinhard and Bryant, 1992). These analyses need to be integrated with floral and faunal data collected from food consumption contexts (Gremillion and Sobolik, 1996; Reinhard and Bryant, 1992; Sobolik, 1994).

The context, participants, and food served at certain meals vary and are intertwined with social relations and symbolic meaning. Feasts, for example, are communicative events meant for display and interaction. The number and makeup of guests and the quantity and type of food at the event are significant in terms of maintaining and developing kin and social

networks (Whitehead, 1984). As Powers and Powers (1984, p. 83) state, "Feasts may in fact satisfy hunger, but they are seen as having some intrinsic social value which transcends the nutritive function of eating. Feasts have social goals achieved by cultural means." Feasting was an integral part of Mayan ballgames that likely was a strategy used by rulers in negotiating relations of power. Importantly, the ballgames and feasting rituals were staged in and around a supernatural arena—the ball court—endowing the feast with added meaning (Fox, 1996). The location of the eating event, thus, is important in understanding the social significance of food consumption. Different foods are often consumed in various settings—residential, public, or private spaces—which may have different meanings corresponding to the meal's location (e.g., Richards and Thomas, 1984; Welsh and Scarry, 1995). At the site of Cardal on the central coast of Peru, Umlauf (1991) illustrated that, in general, exotic and domesticated plant foods were more abundant in private ceremonial contexts, whereas wild plants were relatively more common within domestic spaces. This suggests that certain foods were considered appropriate for consumption in specific locations. The foods consumed in different contexts likely symbolized the ritual and domestic nature of the eating events.

Specific social differences reflecting the complex organization of a society often are symbolized through the consumption of certain foods. As mentioned above, the consumption of llama was probably a symbol of wealth and power along the north coast of Peru that reinforced the social and political authority of the elite and thus was important in marking status (Gumerman, 1994c). Similarly, the consumption of many Mayan foods symbolized abundance and wealth (e.g., Marcus, 1982; Puleston, 1977). Among prehistoric Fijian chiefdoms, meat consumption, especially cannibalism, ideologically functioned in negotiating power relations (Rechtman, 1992). Fragmented human bones (nonburial) were the most abundant bones recovered from middens. A detailed analysis of breakage patterns (fracture angle and outline) as well as numerous ethnohistoric documents demonstrates abundant cannibalism. It was suggested that the consumption of human flesh was a symbol of power legitimizing the status of chiefs. Variation in meat consumption between elites and commoners was essential in legitimizing power for elites, particularly for war chiefs, who usurped power from the traditional chiefs through, in part, cannibalism (Rechtman, 1992).

A distinction is often made between "high-status" and "low-status" food; however, "low-status" food actually may be preferred by the group consuming it over the "high-status" food used by elites (Bennett, 1943; Bowen, 1992; Reitz, 1987; Weismantel, 1988; cf. Singer, 1985, 1987). The food, even if "low status," symbolizes social identity, where, for example, eating barley gruel in indigenous highland Ecuador is an important daily

activity that establishes ethnic identity and affiliation. "High-status" white rice, although a luxury that is desired by the indigenous population, is not a preferred food item for daily use. Indeed, its consumption, and even its use in discourse, is often resented (Weismantel, 1988). Furthermore, the status of a food, either high or low, acceptable or unacceptable, may change through time. In the Oglala food system, for instance, introduced government rations (e.g., beef, salt pork, coffee, and flour) were initially "inedible" but, through time, became acceptable, and some were even considered "Indian" food (Powers and Powers, 1984).

It is thus important to go beyond merely describing what is consumed by exploring the relationship between consumption and social relations, the location of the eating event, and the use of various serving vessels. The social significance of food consumption is pointed out by Weismantel (1988, p. 194): "The shared meal represents the unity of the family that gathers to eat it, but the manner in which it is served and eaten also speaks to the divisions between household members." Meals, such as the Victorian dinner party analyzed by Jameson (1987), often go beyond the family and serve to define membership in certain social groups. The meal, therefore, is actively involved in creating, establishing, and maintaining social relations (see Douglas, 1971). The participants involved in a meal, the contexts in which the meal is served, and the conduct during a meal are imbued with symbolism that structures social behavior.

Disposal

An analysis of food also can incorporate the residues of consumption—the disposal of leftovers—and the by-products of processing and preparation. The disposal of food often has meaning and should be considered in a way that provides data on the underlying structure of a food system as well as definitions concerning the concept of space (Deetz, 1982; Hodder, 1987c; Holt, 1991; Moore, 1981, 1982, 1986; Santley, 1992). "Members of individual societies not only produce and define trash, but also decide how to dispose of it . . . appropriate, culturally-defined means of deposition often vary within single societies and even at a single point in time, and not all people always follow the rules" (Staski and Sutro, 1991b, p. 3).

Leftovers, even though they are the same food item, are interesting because they often assume a different meaning once they become leftovers (e.g., Farb and Armelagos, 1980). Yet leftovers maybe prepared differently (e.g., consumed cold) and often are consumed in different contexts. Indeed, to the consumer the food may have a different "taste" than the original meal. Leftovers may also have meaning that is constructed from its original use. In

Hindu food systems, for instance, leftovers are ranked relative to the hierarchical position of the person who ate the food (Khare, 1976, 1992).

Given that archaeologists often study refuse, it is surprising that research focusing on the social and symbolic aspects of food discard is uncommon. Nevertheless, the contextual analysis of various discard patterns may identify the rules for food disposal. It is possible that certain species may be treated and disposed of in certain ways. Ethnographically in the American Southwest, artiodactyle bones were treated in a special manner—possibly indicating differential disposal (Szuter, 1991). Grantham and Hesse (1991) examine discard patterns to define the function of various rooms within a settlement in the Golan Heights. Patterns observed in the disposal of animal remains at a ritual feasting Neolithic site in Wessex were interpreted as cultural rules representing a wild/domestic dichotomy. Pig and cattle remains, as well as certain wild species, were differentially discarded across the site. This suggests that some species were acceptable within specific areas while others were excluded. Some refuse was the result of ritual feasting and was buried in special pits (Richards and Thomas, 1984). Such refuse may be considered sacrificial because of its contents and location (e.g., specially prepared pits); however, it often represents trash resulting from ceremonial activities that is disposed of in a special manner or location. This is referred to as “ceremonial trash” by Walker (1995) and points to the distinction that many cultures make between everyday refuse and refuse that is produced during special occasions.

Although rarely a focus of research, these studies suggest that the investigation of food disposal is a promising avenue for understanding food symbolism, its meaning, and its relationship to culture. Are specific food items or body parts disposed of in certain ways? In certain locations? What parts of a community or structure contain refuse or, conversely, are clean of refuse? Indeed, the context and manner in which food residues are disposed relate to how space is viewed within a society.

CONCLUSIONS

A comprehensive exploration of the various stages in the food system—from production to disposal—greatly expands our understanding of food and its relationship to complex societies. The variety of cultural anthropological approaches and many recent archaeological advances have produced insights into understanding the dynamics of food and culture. Through such studies, with a focus on specific variation and the active role of food, we can gain a better understanding of human behavior.

In model building we must consider that within complex societies, different individuals—elites and commoners, males and females, specialists and nonspecialists, old and young—often consume different resources for a variety of reasons. By viewing complex societies as groups of individuals that interrelate with each other and have varying needs, wants, and abilities, we can gain a more complete understanding of food and complex societies. This is not to say that studies of small-scale societies (e.g., bands and tribes) cannot profit through such approaches (see Whitley, 1994), but that the development of stratification, specialization, and a political economy creates a wider range of issues that can be explored.

Food provides nourishment, but its structure and symbolism also are intimately involved in developing and maintaining everyday social relations. Exploration of the food system at a detailed level leads to an active view of food and complex societies. We thus gain tremendous insights into the inner workings of culture while also more fully comprehending the processes of culture change. As such, we might hope to develop an understanding of the causes that underlie the behavior behind the food. Indeed, the table is set, we have looked at the menu, and now it is time for the participants to feast on a meal that goes beyond describing the types of food past societies consumed.

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