

APPROACHES TO THE ARCHAEOLOGY OF FOOD

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The author, with Mark Nesbitt, was organiser of a pioneering series of seminars on Archaeology and Food held at the Institute of Archaeology, University College London, early in 1996. We invited her to convert her opening address into an essay for PPC, to give our readers an idea of how archaeologists, on the eve of the next millennium, view the challenges and opportunities which confront them in dealing with all the manifold aspects of food.

Food provision was a primary occupation of most people in ancient times. Yet the specific subject of food systems is rarely the unifying focus for archaeological analysis. This article explores why the topic should be more widely addressed, discusses four major problems associated with the archaeology of food, and suggests five ways to overcome these challenges. It is not a comprehensive overview, but aims to draw attention to a crucial research area. Some aspects of food are now considered to be key archaeological topics. There are a number of pioneering and innovative analyses of the ancient role of food. There is still, however, great potential for the archaeology of food to make further significant contributions to our understanding of the past.

It is important to establish at the outset the terms of reference. Here the term 'food' covers the widest meaning: from raw resources or ingredients; through intermediate stages of preparation; the final prepared product ready for consumption; the by-products and leftovers associated with assembling, preparing and consuming food; finally, the disposal of food-related materials. There are two reasons for this broad viewpoint. Firstly, since food involves extensive processing, it is not really possible to deal adequately with one phase without taking into account what comes before, after and concurrently. Secondly, a focus on one phase of food provision alone makes an artificial distinction. All stages in food provision are vital and all require attention.

WHY IS FOOD IMPORTANT?

A modern example can usefully illustrate the many ramifications of food. Sandwiches are commonly eaten in Britain for lunch. What can this simple food tell us about people and culture? One aspect is the type of sandwich. Is it ham, or chicken, or cheese? This might depend on the belief system of the consumer, depending for example on whether the person is a meat-eater or a

vegetarian, or avoids certain foods like pig products. Maybe the sandwich-eater is on a diet and looking for a low-calorie lunch, or suffers from lactose intolerance and can't eat cheese.

Was the sandwich purchased ready-made, or were the different components like the slices of bread and the filling put together at home? The answers might be due to a range of decisions. They might be based on economics: buying a ready-made sandwich is more expensive. They might be based on preference: home-made sandwiches might taste better or not as good, or the choice might be greater. Lifestyle might play a big role, depending on whether the consumer has time to shop, time to make lunch each day, convenient access to places where sandwiches are sold. If the sandwich was purchased, did it come from a big outlet or a little sandwich bar? Were the ingredients such as wheat for the bread, milk for the cheese, the animals if the sandwich was meat, produced in this country or imported? This leads to broad economic topics of production, trade and transport. Nutritional, economic, belief systems and others, all can influence the preparation and consumption of a single type of food. The structures of diet and cuisine are shaped by such systems; they are a key part of cultural expression based on biological necessity.

CHALLENGES OF THE ARCHAEOLOGY OF FOOD

Most archaeologists who examine the subject of food concentrate on resources, that is, ingredients. These ancient resources indicate what was used to prepare meals. Such material provides critical data about human ecology, food procurement strategies and economic systems. Nevertheless, there is far more to food than the raw materials. What prevents many archaeologists from considering food in the broadest sense? There are four main barriers which must be overcome if the mechanisms and significance of ancient food provision are to be fully understood.

First of all, food is highly complex. When Audrey Richards was commissioned to write a report on the sociological factors which directly affected the food supply of one African group, she ended up producing a hefty tome which encompassed the entire economic life of the tribe. A comprehensive treatment cannot be reduced to isolated parts. Archaeologists, however, must always contend with missing evidence, incomplete material and ambiguous remains. As a result, tracing the role of food within ancient cultures is an enormous task. Understanding the components of food systems on their own is absorbing enough without trying to encompass the whole.

A second problem is that the manipulation of food involves several stages. The ingredients must be *procured*. This might be by gathering, hunting and fishing or by agricultural production. The resulting resources often need some preliminary *processing*. Having secured these raw

materials, they need to be *distributed* in some fashion and perhaps *stored*. The subsequent *preparation* phase renders the raw foodstuffs into final products by any of a huge variety of methods. Preparation may, as with the procurement phase, generate a series of by-products. Having produced the food ready for eating, it is then *consumed*, an act which may be extremely simple or very complex, depending on cultural precepts. Finally, there is the *disposal* of leftovers, by-products and waste parts. The systems for discard are also varied, depending on the categories of materials to be disposed of and the culture involved.

The third complication is closely linked to these stages and stems from a key characteristic of food. Food generally undergoes three main transformations as it passes from original materials, to final products, to consumed meal. Initially, raw resources are *modified* in some way, as harvested grain is made into flour, or an animal is *butchered* into cuts of meat. Then, the modified transitional ingredient is *prepared* into the food product. It may be mixed with other ingredients, boiled, roasted, baked, fermented, dried, shredded or otherwise treated. This blending of ingredients and variety of treatments are further signs of the complexity of food. The fully prepared product is then ready for consumption. When *digested*, it is changed into excreted waste. At each transformation, radical physical and chemical changes can occur. Evidence for each change may be retrieved, but it may be very difficult to establish links between raw materials, intermediate products, finished foods and excreted waste.

The final reason why archaeologists have tended not to make food a central research topic is that food is highly perishable. Passing through successive transformations, the material remains of food are not only more difficult to recognise, but less likely to survive. Raw materials are usually well represented in archaeological sites by shells, bones and teeth of animals, and by charred seeds and other parts of plants. Once resources become transformed, however, the material traces are much more scarce. Apart from some ritual purposes, prepared food is made for consumption, and frequently is eaten immediately or stored only briefly. What might escape being eaten by people is likely to be consumed by scavengers such as dogs or pigs, and pests like rodents and insects. Prepared foods, made to be more digestible for human beings, are also easily attacked by fungi, moulds and bacteria, and so decay, leaving little trace. Except in unusual conditions such as extreme dryness or cold, the chances of finding easily recognisable prepared food, ready for consumption but never actually eaten, are therefore slim under ordinary archaeological conditions. Digested and excreted food materials generally decay and are often scavenged, and thus are also rarely preserved.

OVERCOMING THE CHALLENGES

These problems are certainly substantial but they are not insurmountable. The first dilemma which must be tackled is lack of evidence: if the material remains no longer survive, there are no data with which to investigate ancient food. Although it can be difficult to recognise food remains, more ancient foods escape consumption and decay than might be expected.

Some raw materials, representative of procurement, are usually ubiquitous on archaeological sites. Bones and teeth of vertebrates and shells of molluscs are amongst the most robust of food-related remains. Even they do not survive all conditions, as in acidic soils and peat. Plant resources such as seeds and tubers were often directly exposed to fire, presumably during preparation or tidying up after preparation. As a result, a proportion is preserved through low-temperature charring. Other plant parts such as leaves and fruit flesh were less often burnt but when this did occur, they generally were destroyed or their remains are now unrecognisable. Despite the gaps, skeletal parts and plant fragments do survive reasonably well overall. These classes of evidence have received detailed attention in recent decades, so that past procurement systems are now much better known and continue to be a key topic of research.

There are some extreme circumstances in which prepared or digested foods, as well as ingredients, have a much better chance of survival and retrieval than normal conditions allow. Roman bread loaves were entombed in bakeries by rapid hot burial in ash at Pompeii. Very arid climates desiccate organic material. Whole bread loaves and residues of beer dating to Pharaonic times have been preserved in Egypt. Dried coprolites (ancient faeces) from the American south west and gut contents in human mummies from the highlands of South America have been examined to reconstruct ancient diets. Gut contents are also preserved in waterlogged conditions, for example in British bog bodies. Regions of permafrost halt decay by deep freezing, as with the nomad burials of the Altai in southern Siberia.

Even in areas where decay processes are unchecked, however, prepared food remains can be and have been found. Less than 50 years ago, archaeobotany was hardly established because the wide occurrence of charred ancient plant remains was unknown. After water-flotation methods were invented, retrieval and identification of seeds and chaff expanded rapidly. Work on tubers and other less obvious plant tissues lagged behind until techniques were developed to recognise and identify them. Recently applied microscopy and biochemical techniques are leading to new insights about charred bread fragments and loaves recovered in Britain and in Scandinavia.

These examples demonstrate that recognition and proper recovery techniques are the first steps in the successful archaeological analysis of food. When excavators know that organic remains do survive and use excavation

methods specifically designed to recover each class of material, then good collections of artefacts are assembled. Many techniques, such as water-floitation for plant remains, have become well established in the armoury of the archaeological specialist. As awareness increases about survival of less obvious materials, suitable recovery techniques are becoming more common. Methods now known to yield valuable information are, however, not universally applied. For example, although ancient cooking vessels sometimes have charred residues sticking to them, they are all too often washed clean. The ability to reconstruct food habits of ancient peoples ultimately rests on the widespread use of appropriate recovery during archaeological excavation.

The second step is suitable examination. Much of the innovation which has led to increased understanding of ancient procurement systems has centred on the ways in which assemblages of artefacts are studied in the laboratory. One example is chemical analysis of invisible residues. Since the discovery some years ago that tiny quantities of organic residues survive lodged in the fabric of ancient pottery vessels, methods of obtaining information about them have been actively developed and are constantly being improved. In turn, as more is understood about how such residues are preserved, excavation can be adjusted to improve the chances of recovery.

There is increasing awareness that less obvious food remains can survive over time, and diverse analytical techniques are being applied and refined. There has been little attempt so far, however, to develop a coherent theory of food in ancient societies, or as part of ancient culture. Such a theory would provide a structure to integrate the work which has been done, and would help to deal with the problems of complexity and transformation. One discipline which offers insights into such a theoretical framework is social anthropology. Because food is a basic concern for all human societies, it has long been a subject of interest in anthropology. One active school of thought argues that the impetus for food choice is human biology, and that a theory of food systems can rely on analysis of local resources and nutritional needs. Biology is certainly critical to food provision, but social anthropology has clearly demonstrated the importance of food habits beyond physiological requirements.

The anthropologist Ellen Messer has reviewed the diverse ways in which social anthropologists consider food, including nutritional, medical, ecological, economic, symbolic and cognitive dimensions. The perspectives which anthropologists have used to look at food are as wide as archaeological approaches to the past. One of Messer's main conclusions is that food systems are multi-dimensional and to understand them, their inter-relationships must be investigated. Analyses of both the biological basis and the cultural elaboration of food and food habits are essential.

The primary purpose of food is to provide nutrition. Humans have

fundamental calorie and nutrient requirements and our digestive systems operate in specific ways. This biological information is a third way to deal with some of the missing evidence in the archaeological record. A biological baseline gives some guidance as to what is necessary and what is possible. Furthermore, it can provide information relevant to broader enquiries. For example, without knowledge of how bones, tendons, muscles and ligaments are connected, the full significance of butchery mark patterns will be lost. Without an understanding of the different structures of grain and chaff in cereals, the processing methods required to obtain clean grain will be overlooked.

The general resources which people need to eat, the framework for preparing them and the digestive system which absorbs nutrients are all based on biology. How nutrition is obtained and in what form, with what accompanying beliefs and preferences, is largely structured by culture. Another anthropologist, Jack Goody, has provided some theoretical ideas for the analysis of food which could profitably be adopted by archaeologists. Goody relates food to the central human process of production. His five phases of food provision have already been mentioned: procurement, distribution, preparation, consumption and disposal. Table 1 sets out Goody's *phases* such as procurement, with their associated *processes* such as growing crops, together with *locations* where these activities tend to occur. The tabulation also shows the primary cultural factors involved at each phase. The divisions noted here are clearly not rigid; the elements listed grade into one another. The table is a framework for a fourth approach to the archaeology of food. It helps to make explicit the diverse dimensions of food and to articulate their inter-relationships.

Archaeological investigation can be related to Goody's ideas on food and modern cultural processes. Current work on food in archaeology most often concentrates on resources and their patterns of use or change through time. This is procurement, and deals largely with ancient economy. Much archaeological evidence, however, derives from material which has been discarded. The same data can be used to look at both the components of ancient economic organisation, as well as how it had been discarded, and thus what social and belief systems led to the pattern of disposal. An example of how one data set can be used to look at several related issues is the analysis of isotopic and trace element data from human skeletons. Much of this work has focused on the resources which caused bone chemistry signatures. It also has the potential, largely unexplored so far, to look at patterns of consumption and therefore to explore social structures and belief systems.

The fifth tool to deal with the complexities of ancient food is the use of an integrated approach. Goody's five phases can be adapted to apply specifically to the incomplete archaeological record (Table 2). There is much more

Table 1. The phases of food provision, showing for each stage the process involved, the location where activities take place, and the key influencing cultural factors. Compiled and adapted with reference to Goody, 1982, pp 37-38.

PROCESSES	PHASES	LOCUS	DOMINANT CULTURAL FACTORS
Collecting/ hunting	Procurement	Hunting/gathering region	Economics: Primary production; Work organisation; Technology of food production. Belief systems: What is/is not food.
Growing/ animal husbandry		Farm/Fishery/ Garden	
Allocating/ storing	Distribution	Granary/Market	Politics: Rent/tribute/tax/ potlatch; Divisions in domestic unit; Decisions on seed, sale, consumption.
Cooking	Preparation	Kitchen/ Other areas	Social: Division, stratification of labour. Economics: Technology of preparation.
Eating	Consumption	Table/ Eating area	Belief systems: Allocation of particular foods; Prohibitions.
Clearing up	Disposal	'Scullery'	Social: What is disposed of vs. consumed Belief systems

Table 2. The archaeological and associated data which relate to each stage of food provision. This tabulation shows the potential abundance of evidence which can be applied to the study of ancient food systems.

FOOD PROVISION PHASE	TYPES OF MATERIAL REMAINS	SUPPORTING DATA
Procurement	- plant remains - animal remains - resource procurement tools - human remains	- ethnography - experimental replication - biology
Storage	- silos - bins - storage vessels	- ethnography
Preparation	- hearths, ovens - tools e.g mortars, querns, flint & metal blades - vessels: pottery, metal, basketry - house layouts - food residues and remains	- ethnography - experimental replication - biology
Consumption	- vessels - house layouts - gut contents: known individual, short time - coprolites: unknown individual(s), short time - cess: known/unknown individual/group, varying time span - human remains: individuals, lifetime span	- ethnography - biology
Disposal	Remains disposed of: - vessels - preparation by-products - leftovers Condition of remains - eg whole vs. cracked bones Disposal patterns within/around settlement	- ethnography

scope to understand each phase with archaeological evidence than might generally be supposed. Data from tools and installations connected with food preparation, consumption and disposal are as important as actual remains of food. The insights available from careful choice of ethnographic analogues and accurate experimental replication should also not be overlooked. Ancient procurement is not the only phase accessible through archaeological evidence, although its interpretation is perhaps least problematic.

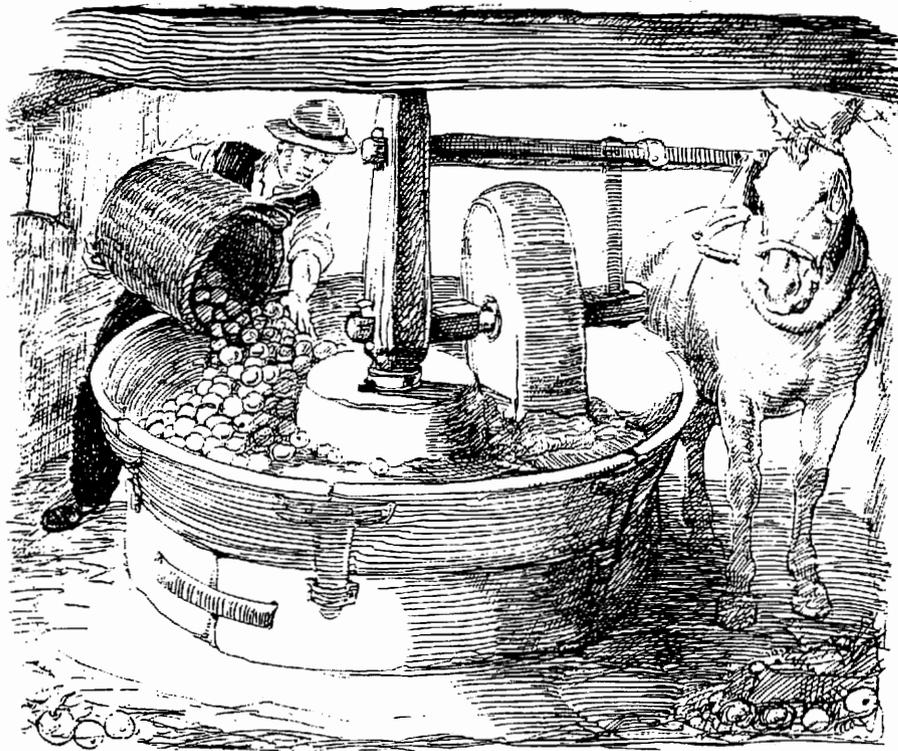
The complexity of the subject and the fragmentary archaeological record means that no one source of evidence should be assessed in isolation. On their own, for example, house plans may tell us nothing about consumption. But this data taken together with vessel type and distribution, as well as the information which relates to procurement and preparation, may indicate, for example, whether consumption was communal or centred around households, and whether there were differences in consumption patterns amongst different groups within society.

The potential for the archaeology of food has yet to be fully realised. The principal difficulties are the complicated biological and cultural factors which affect food, the several phases involved in food provision, the profound transformations which food undergoes throughout these phases and the vulnerability of food, as organic material, to loss from the archaeological record. These problems can be dealt with in a variety of ways, many of which are already successfully but not consistently used. Archaeologists are becoming aware that food remains do survive and their recovery requires specific excavation procedures. Appropriate analytical techniques are being improved and could be more widely applied. Judicious use of a biological framework provides a boundary for the possible diversity of ancient food provision. Social anthropology offers useful guidelines for a theory of the archaeology of food. Although fragmentary and damaged, archaeological remains nevertheless allow a reliable understanding of ancient diet and cuisine through a multi-disciplinary approach. Despite major challenges, archaeology can demonstrate how ancient societies produced and consumed their food, and so offer rich insights into past cultural expression.

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The Cider Horse, a drawing done by Dorothy Hartley for an article in the Daily Sketch on 9 October 1934. The drawing, so far as we know, has not been published elsewhere and is the property of Mrs Fred Littman, to whom we are grateful for permission to reproduce it here. Dorothy Hartley is the subject of an essay by Mary Wondrausch, beginning on page 42; and the re-issue of her great book Food in England is celebrated on page 51.

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