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Complementary views of exchange: acquisition, production and consumption

A new challenge for archaeology

After the so-called revolution created by the 'New Archaeology' of the 1960s and 1970s, the relative peace and calm of more recent years has probably come as quite a relief to many practitioners. This comparative lack of fervor and intense debate is deceptive, however, for a feeling of discontent is steadily building up again, although the cause of the present crisis is markedly different from its predecessor two decades ago. The proponents of change associated with the 'New Archaeology' were mainly asking different questions of their data (Renfrew 1983), whereas today the issue of interest is how to find answers to these and even newer questions about the nature of human behavior in the past. As the shouting over goals and aims of the discipline began to die down and scholars set out to achieve their new objectives, they rapidly began to realize the problems inherent in utilizing data from the archaeological record to test hypotheses concerned with human behavior. The first stumbling block was reached when archaeologists acknowledged that the archaeological record was neither a direct reflection of behavior (e.g. Schiffer 1976) nor a simple distortion of reality (Binford 1981b). The problem lies in the dilemma so clearly articulated by Lewis Binford (e.g. 1977a; 1981a; 1981b; 1983): archaeological data consists of static, dead facts which have to be converted into processual statements about human behavior by means of inference. In other words, unlike colleagues who study the modern world, archaeologists and researchers in the sister disciplines of the historical sciences cannot observe behavior directly because it is not preserved; only the effects of behavior remain.

What is so clearly lacking in archaeology at the moment is a set of reliable and accurate methods for translating observations made on static data into reconstructions of the dynamic phenomena which form the interest of most archaeological research (*ibid.*). Theories for explaining behavior have never been so abundant in the archaeological literature, but the methodology necessary for allowing their predictions to be compared to what actually happened in the past is so impoverished that current debates are usually reduced to arguments about whose conception of plausibility is best. What can be done to resolve the present state of paralysis created by the inability of archaeologists to achieve their stated aims? How does one invent a methodology that can link dynamic behavior with the static facts in the archaeological record? These are the 'new' questions that are beginning to dominate the archaeology of the 1980s.

Answers are already beginning to appear (e.g. *ibid.*; Hodder 1982b). The solution

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obviously lies in research conducted in the present where the relationship between behavior and its material correlates can be observed directly. Middle range research (e.g. Binford 1977a; 1981b; 1983), actualistic studies (*ibid.*), taphonomy (e.g. Gifford 1981), modern material culture studies (e.g. Rathje 1979; Gould and Schiffer 1981), and ethnoarchaeology (e.g. Gould 1978a) are just some of the names given to research which seeks to discover the general processes which link behavior with facts potentially recoverable from the archaeological record. The present study is also a contribution to this broad field of research, because it attempts to develop methodology which can be used to infer processes of prehistoric exchange from archaeological data.

For some years archaeologists have been attempting to create methods for studying exchange. Although their ideas have not always originated from observations on the modern world, they may still be valid and are worth investigating. It seemed to me, however, that archaeology had largely overlooked several areas where links between behavior and material correlates might occur; these also merited the application of middle range research. Beginning with a conception of how exchange operates, I proceeded to develop ideas about how the process would affect types of artifacts which archaeologists commonly find on sites. Having framed a series of hypotheses, I tested them against a set of ethnographic data. The results suggest that the original proposals are certainly on the right track. This research is not based on an intense study of one ethnographic situation, as are the majority of current actualistic studies, but it still belongs in the same category with these studies because it represents an explicit attempt to develop methodology for making inferences about human behavior. In doing so it accepts the most fundamental challenge made to archaeology.

Starting from basic facts

One of the most noticeable changes in archaeology within the past decade has been the significant increase in research on prehistoric trade or exchange. Since in the minds of many archaeologists and anthropologists the term 'trade' has become associated with the reasonably organized and competitive mechanism by which goods are distributed in the modern world, the alternative 'exchange' will be used here to encompass all forms of distribution in which goods and/or services are passed between hands (cf. Renfrew 1975: 4). In order to include as wide a range of types as possible, no further assumptions are made concerning the symmetry of the flow of items, the nature of the commodity, or relationships of the people involved. It is remarkable that as recently as 1969 Renfrew was correct when he observed that

> there has been little serious discussion of prehistoric trade mechanisms and virtually no attempt to set up the facts on a quantitative basis. Finally, there has been little attention to the role of trade, an important element in economic growth, as a causative factor in cultural change within given regions. (Renfrew 1969a: 151)

Certainly the ever-growing number of publications which treat both the mechan-

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isms of exchange and their role in the socio-political system as well as the numerous reports of detailed studies of particular items exchanged in the past demonstrate that archaeologists now view trade in an entirely different light as an important aspect of cultural systems (e.g. Wilmsen 1972; Webb 1974; Sabloff and Lamberg-Karlovsky 1975; Earle and Ericson 1977a; Clough and Cummins 1979; *Mankind* vol. 11 (1978); Fry 1980; Ericson and Earle 1982). Although part of this shift in research interests can be explained by developments in archaeological theory as a whole, particularly in the growing importance of models of culture process borrowed from ethnography (e.g. Sahlins 1972), an equally important cause has probably been the development of a wide range of scientific techniques which are capable of describing the composition of many types of materials in such a way that the raw material source of certain artifacts can be identified (e.g. summaries in Renfrew 1975: 39; Webb 1974; Taylor 1976; Tite 1972; Peacock 1977; Clough and Cummins 1979; Howard and Morris 1981; Harbottle 1982; numerous reports of characterization studies appear regularly in the journal *Archaeometry*).

Typically, a particular study of prehistoric exchange begins when an archaeologist suspects that some of the artifacts found at a site may be 'foreign'. The relevance of this kind of information, however, has changed over the years and has had a profound effect on the methods used to study exchange. Until recently, the recognition of imported items was based almost entirely on stylistic criteria, although occasionally goods manufactured in raw material known not to occur in the local region were also singled out (e.g. 'exotics' like gold, amber, turquoise or very distinctive materials such as obsidian and marine shell). In some cases it was possible to identify the source of the goods, or at least the general area of origin, because the number of potential sources was extremely limited. The dependence on style was probably helpful in this regard; pinpointing raw material sources would have been much more difficult using simple macroscopic inspection. During the popularity of the diffusionist paradigm in archaeology these rather crude links between two places were adequate, since all that was required to help explain how change occurred in one area were 'influences' or possibly 'invasions'. The assumption that interactions always took these forms meant that a rough approximation of source area was sufficient.

In contrast, contemporary archaeology views exchange as a form of interaction such that a *system of interrelations* operates on a regional level. To reconstruct the process of exchange, it is necessary to identify the network linking the source with consumers and, more importantly, the exchange partners with each other. In other words, the data requirements have changed from approximate source to accurate data on source location as well as the spatial distribution of the goods flowing through the exchange system. Although the diffusionist paradigm may also ultimately have led to the rapid development of characterization techniques, which are the basis of modern exchange studies, it is unlikely that the need for the spatial pattern of artifacts from each source would have arisen. The basic groundwork required for any current study of exchange thus involves two components, both of which are highly dependent on accurate characterization:

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(1) detailed description of the composition of the raw material source, and
(2) spatial distribution of artifacts presumed to be derived from a single source, because of the similarity of their composition with each other and to the source in question (cf. Renfrew 1975: 39–40; Earle and Ericson 1977b: 5–6; Earle 1982a: 3–4).

The composition of goods can be characterized by a large number of available methods (Renfrew 1975; Earle and Ericson 1977b; Earle 1982a; see above). Choice of technique will depend on how distinctive a raw material is and therefore how accurate a fingerprint is necessary – i.e. whether macroscopic properties are sufficient or mineral or elemental composition is required – as well as such factors as cost and sample size. Identification of source is not always straightforward, particularly if raw materials from several sources are combined in manufacture or goods are recycled. On the whole the precision and accuracy of techniques has increased tremendously and very many projects are successful at matching artifacts with source. Following on from the characterization stage, the spatial distribution of goods throughout a region is normally used to define the limits of the exchange system. A wide range of additional data can also be collected: quantity of goods at sites, form of imports, context of finds, function of artifact, and so on.

These, then, are the static facts which archaeologists now normally collect – the basic groundwork for exchange studies. But what do they tell us about prehistoric exchange? How can they be used to infer behavior that no longer exists? What are the relationships between the spatial patterns of an item and the way in which it was distributed from its source to the place where it was found? It seems obvious that the links between behavior and material evidence might be quite complex. For example, consumers could obtain raw materials from sources themselves or from neighbors, friends, or traders by way of a large number of exchange mechanisms. Different processes could have operated concurrently in any one area. In general, archaeologists are quite aware of the difficulty of their task, but this has not deterred them from building up a set of techniques for inferring the dynamic process of exchange on the basis of archaeological material. The very wide range of approaches will be reviewed in the next chapter. Before assessing the value of these methods of inference, however, it will be useful to try to develop some general principles which are common to all systems of distribution. The exercise is extremely valuable not only because it helps identify the assumptions that implicitly guide the process of inference used in many studies of prehistoric exchange, but also because uncovering the basic framework on which inferences are built reveals new avenues of research which have not yet been fully explored.

Using a general system

Attempts to study the past process of exchange appear doomed from the outset because the actual object of study – passing of goods between two people – cannot be observed directly. Nevertheless, if behavior has left behind discernible material traces, it might still be possible to infer what had happened. For example, the

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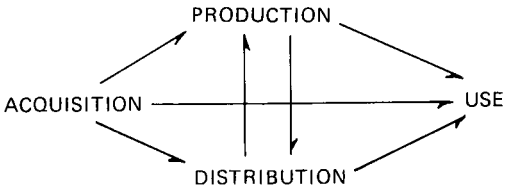
construction of a wooden structure is likely to modify the ground surface in regular and predictable ways so that certain stains in the earth can be interpreted as holes for posts, and so on. Exchange poses more serious problems, however, because the act of passing an object between two individuals is unlikely to be associated directly with any material correlates. Although the item is transferred from one place to another, it does not necessarily undergo any changes in form when it is exchanged, and it will most probably not enter the archaeological record at the moment and on the spot where the behavior took place. Furthermore, the simple presence of a nonlocal product at a site certainly does not form an adequate basis for inferring exchange, since goods can be transported by any number of other mechanisms. When viewed on its own as an isolated process, exchange seems to be outside the range of behavior which is accessible to archaeologists by means of inference, as Hodder (1984: 26) has argued.

I take exception to this extremely negative approach because exchange does not operate in a behavioral vacuum. The key to studying exchange can be found by placing it in a wider framework. If it were integrated into some sort of system of behavior, then the nature of the exchange taking place will have affected other components; the results of such interactions in turn may have been associated with concrete, material things which can be recovered in the archaeological record. Admittedly, in this way exchange is monitored only indirectly by means of its relationships with other forms of behavior. Along these lines, one productive way to conceptualize exchange is to consider it as one of the possible stages through which a good may pass from the time when it is created until it is discarded and enters the archaeological record. A very simplified version of the general system of activities surrounding the life history of an object used in a cultural context is presented in fig. 1. For purposes of illustrating only a very basic point, several plausible trajectories (e.g. recycling) have deliberately been omitted to keep the discussion on the desired general level.

The main constituents of all goods must originally be acquired from the material world. In the simplest case, the raw material is only obtained and used before it is discarded. Many artifacts are not utilized directly, but are modified and converted into a different, usable form or combined with other constituents to form a composite good. If no exchange takes place during the sequence, then the form of distribution is generally termed 'direct access' (Renfrew 1975: 43). Items may, however, be exchanged as unchanged raw materials, partially modified preforms, or as completed tools. All the separate stages in this very general system – acquisition, production,



1. General model for archaeological inferences about prehistoric exchange.

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distribution (including exchange), and use – will be interrelated such that behavior in one sphere partially causes and to some degree is caused by behavior in another. For example, the way an artifact is used determines to some extent what raw materials are selected and how the tool is produced. Similarly, the nature of exchange will also influence raw material acquisition, production and use of a good. Archaeologists have long utilized the relationship between exchange and use or consumption of an object, but recently scholars have begun to realize that production is also intimately tied up with exchange (see ch. 2 below). For instance, Earle (1981: 231) has stated that 'production and exchange as the two key components of an economy should be studied as an integrated system' (cf. Earle 1982a: 8; Ericson 1982; Van der Leeuw 1981: 382; Hirth 1984: 301). In contrast, very few studies of exchange have exploited its links with resource acquisition. In no way can the four processes of acquisition, production, distribution and use be considered as constituting a closed system of behavior. A large number of additional factors also influence how each one of the main elements will operate; they may even have much greater effects on one or more elements than do the small number of behaviors depicted in fig. 1.

The point of this exercise is not to build a comprehensive systems model of human behavior or to explain differences between types of exchange. On the contrary, the aim is merely to show first of all that exchange can be incorporated into a larger framework and secondly, that although exchange itself may not have material correlates, it interacts with other forms of behavior that do leave visible traces in the archaeological record. Since in this case these latter types of behaviors – acquisition, production, and consumption – are partially affected by the nature of exchange, then some of their material remains will also record information about the process of exchange. A wide range of similar networks of behavior including exchange could also be constructed. The choice presented here was not made because the links are the most important for explaining why exchange operates in a certain way in a particular case but because all these types of behavior can be associated with potential archaeological facts. Since observation, explanation and hypothesis testing are generally independent processes, it is not surprising that the variables employed in one operation differ from those central to another. In order to evaluate ideas about how and why exchange took place, archaeologists must first build a methodology that allows them (through inference) to 'observe' it. The recognition of links among exchange, other types of behavior such as acquisition, production and use, and material facts is therefore the essential first step in establishing a means for studying exchange.

For most archaeologists the recognition that exchange can be monitored by means of its position within a larger system of behavior will come as no surprise, since this is the basic method employed in all studies of prehistoric exchange. Nevertheless, many appear to have been entirely unaware of the nature of the assumptions on which their reconstructions of prehistoric exchange have been based. Since so few scholars seem to be cognizant of exactly how they have been forming inferences about past behavior, the analyses of exchange processes have proceeded in an haphazard, unsystematic manner. A further result is that the methods currently in use exploit only a limited number of the possible links between exchange and behaviors which produce

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material facts. More seriously, archaeologists continue to proceed with their interpretations without having ever investigated whether their specific implicit correlations among exchange, other types of behavior and facts observed from the archaeological record have any basis in reality. It therefore seems a worthwhile exercise merely to have described the general process of inference and to illustrate the important place of studies of acquisition, production and consumption of goods in the methodology used to record past processes of exchange. These points will be substantiated more fully in the next chapter in which the methods utilized by archaeologists to reconstruct processes of exchange are scrutinized in detail. At that time the degree to which archaeologists lack a coherent and systematic approach to exchange should become obvious.

Developing middle range theory

Once the basic structure of archaeological inference concerning exchange has been made explicit, one can build a more consistent and rigorous methodology to replace the unsystematic and incomplete body of procedures that have been developed over the past few years in a rather 'hit and miss' fashion. Two separate stages are required. In the first place we need to determine the exact nature of the mutual feedbacks between exchange and the other components of the general system (fig. 1), so that given a specific type of exchange, the effects on acquisition, production and consumption can be described. Secondly, the material consequences of these effects must be described in detail, since they are the actual data which will be present in the archaeological record. Generally, only the latter type of research has been included under the heading of middle range theory (e.g. Binford 1977a), but the former is part of the same process, although it may require slightly different research strategies.

Both tasks can be undertaken in a number of different ways. One could begin by observing the process of exchange in a broad spectrum of settings taking care to note its effects on resource procurement, production and use and the correlations between these and data which would be present in the archaeological record. Recurring patterns would then be used as the basis for inference to archaeological situations. Such empirical generalizations can be misleading, however, since one's understanding is limited to the specific set of instances. On the other hand, the data can also be used as the basis for building general theories which would be applicable at all times and places (cf. Binford 1978; Whitelaw 1983). A third approach, which in this case is facilitated by the large body of previous research and speculation on how exchange operates in various cultural situations, attempts to create the relevant theory first and then deduce a series of expectations which can be tested against data from the present, where behavior and its material consequences can both be observed directly. If the theory adequately accounts for the variability observed, then it will be appropriate for use in making inferences about the past. Most ethnoarchaeological research at the moment tends to adopt one of the first two, more inductive techniques. Alternatively, for a subject such as exchange which has already received a great deal of attention by anthropologists and economists, the final deductive approach seems equally if not more promising in terms of producing relevant results.

Guided by the view that a systems perspective incorporating exchange with

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acquisition, production and use offers archaeology a basis for making inferences about prehistoric exchange, in ch. 3 an attempt is made to investigate the two different sets of relationships needed for the relevant middle range theory. The research begins by describing the variability in exchange systems observed ethnographically in terms of the degree to which the ratio of material benefit to cost is maximized. In the first step of theory building, differences in type of exchange are linked to variations in control over resources and efficiency of behavior relating to acquisition, production and consumption. Secondly, proposals for the material consequences of efficient behavior are developed in detail since this approach has the wider applicability. Finally, following the development of this body of middle range theory, a series of hypotheses deduced from it are tested on a number of ethnographic cases representing a variety of exchange types but limited to stone tools to provide a measure of consistency. The results of these analyses are highly encouraging because they provide general support for the theorized relationships between exchange, control, efficiency and a series of material traits.

Establishing the theoretical basis for a methodology is only the very beginning. Operationalizing the concepts is just as critical and can be even more problematical. Unlike building the groundwork, this later stage necessarily takes place within the context of a specific set of archaeological data. In order to illustrate how the proposed methods can actually be utilized, I have therefore applied the approach to a particular archaeological case involving the prehistoric exchange of obsidian in southern Greece. As described in ch. 4, which provides the background to the research, both commercial marketing and balanced exchange have been proposed to account for the distribution of obsidian on prehistoric Greek sites. The results of this research are extremely interesting for understanding the culture history of the area, but are more important because they challenge many currently held assumptions concerning the development of complex society; nevertheless, these interesting aspects are more appropriately discussed elsewhere (Torrence 1983; 1984). My purpose in selecting the analyses presented here is merely to display just a few of the many new avenues of research which open up when exchange is considered from a fresh perspective. In particular, I am eager to emphasize the sizeable and largely untapped potential connected with the study of resource acquisition and production. Beginning in ch. 5 with the most traditional approach, Greek obsidian exchange is first studied as a regional phenomenon, although here the focus is on the manufacture of goods rather than their use. In ch. 6 the issue of craft specialization is considered in detail within the context of the analysis of a putative workshop. The final illustration in ch. 7 concerns research carried out at the obsidian sources themselves. In each case expectations for different types of exchange are first deduced from the middle range theory developed in ch. 3. These predictions are then compared to the available data to see which provides the closest fit. The whole exercise is extremely valuable for highlighting the methodological problems that require further research.

Breathing life into archaeological data such as the assorted pieces of obsidian found on ancient Greek sites is certainly not the straighforward task which scholars might

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once have thought, but I cannot accept the alternative view that it is impossible. Before these inanimate objects can be made to reveal their secrets about middleman traders, craft specialists, or exchange partners – behavior that cannot be directly observed today – archaeologists have to learn not only to ask the appropriate questions of them but to pose their queries in a way that will yield the desired information. In other words, we need methods of inference that are relevant to the nature of the data recovered from the archaeological record. One way forward is to learn about the links between (1) the context and physical characteristics of artifacts – traits which can be studied in the present; (2) the past behavior which created these variables; and (3) the nature of prehistoric exchange operating at that time. I believe that the future success of archaeology as a discipline is dependent upon the development of middle range theory along these general lines. The specific proposals set out in the following chapters and applied in the case study are just one example of how archaeologists can begin to discover the very specialized methods needed in order to study the past.

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Past and present perspectives

Given the ever-growing number of archaeological studies of exchange, it might seem slightly odd to suggest that there are still new methods of analysis which could offer increased knowledge of this past type of behavior. For reasons that are not entirely clear, however, the discipline seems to have almost totally restricted itself to resource use as the basis for inferring exchange, thereby ignoring the potential contribution of acquisition and production, although they are also part of the same economic system (fig. 1 above). In order to illustrate the relatively narrow framework in which archaeologists have tended to work, and therefore to justify the need for exploring new approaches, it would be interesting to review the types of methods currently in common use. Since a definitive review would be a book in itself, I have focused on a single raw material type.

Obsidian provides an excellent choice. Since it is one of the very few goods in the past to have been used both in many parts of the world and by societies ranging in complexity from mobile hunter-gatherers to highly complex states, obsidian has been the subject of very diverse approaches derived from widely varying points of view. The sizeable volume, numerous approaches, and generally high quality of exchange studies based on obsidian should therefore accurately reflect the validity and the shortcomings of archaeological methodology as it now stands.

In addition to the perspective adopted for monitoring exchange (i.e. production, use, procurement), archaeological case studies can usefully be divided into two main classes defined by the scale of the analyses undertaken (McBryde 1979: 113). Most archaeologists have adopted a *regional* viewpoint that involves the use of attributes, such as size or quantity of a traded item, recorded at a number of sites over a wide area. The spatial patterning of the attributes is then interpreted in terms of various models of exchange. The other widely adopted approach is based on an analysis of the foreign, imported goods found at a *single site*. Using information on the location of the sources for these objects, their proveniences on the sites and their relative abundance at differing periods in the occupation of the site, in many cases the mechanisms of exchange can be reconstructed. Since the former are the most numerous, I will begin with studies conducted on a regional scale.

Regional studies of resource use

The first task of a regional study is obvious: the region must be defined in terms of the goals of the research. For most studies of obsidian exchange this has not been a difficult problem, since the research goal has been to explain the processes which

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