

## A MODEL OF THE FLOW OF GOODS THROUGH A MARKET CENTER

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### Introduction

Several archaeologists (Binford 1977; Goodyear, Raab and Klinger 1978) have recently called for the creation of "middle range theory" in archaeology. By this term they mean the establishment of a body of theory which will help bridge the interpretive gap between static archaeological facts and the dynamic past phenomena responsible for them. This body of theory would encompass such considerations as natural and cultural formation processes (Schiffer 1976; Sullivan 1978). In response to this exhortation I offer the following discussion and model of the flow of goods through a market center.

### Background

The study of prehistoric trade has had a long history in archaeology (c.f. Daniel 1962; Willey and Sabloff 1974). It is certainly no accident that this is true as traces of ancient exchange activities are often much more archaeologically visible than those of other human behavior patterns.

In discussing trade in complex societies many archaeologists (e.g. Renfrew 1975, 1977; Johnson 1975; Hodder and Orton 1976; Sidrys 1977) use the assumption that there is a regular relationship between the quantity of goods recoverable at an archaeological site and the quantity which passed through it. This assumption, though certainly logical, may be simplistic. Indeed the quantity of goods recoverable at a site may constitute only a minimal indicator of the quantity which passed through it, if there is any regular relationship at all.

In reality archaeologists know very little about the actual relationship between the flow of a market good and the amount of evidence the flow will leave. Most ethnographers and even ethnoarchaeologists, when they have looked at trade, have simply documented the interactive network of trade (e.g., McBryde 1947; Lauer 1971; Crossland and Posnansky 1978; Reina and Hill 1978) and have not considered how the consequences of trade behavior will be reflected in the ground, much less the quantitative relationships between the various factors responsible for this reflection. In fact Kramer (1979:11) in her recent discussion of directions for future research in ethnoarchaeology calls for the delineation of "material correlates of intra- and inter-regional exchange systems."

The relationship between the amount of goods flowing through a market center, by which I mean a marketplace and the nucleated settlement zone surrounding it, and the amount recoverable archaeologically from that center is quite complicated. The complexity arises because of the several intervening levels of processes which are pivotal in the transformation of market goods into archaeological remains (Hodder 1978, 1979). They include exchange (purchase) and the cultural formation processes (Schiffer 1976) of use, reuse, discard, loss and abandonment. Also important are the natural formation processes (Schiffer 1976) like soil deposition and the deterioration of materials. Obviously any one of these intervening processes may have a skewing effect on the picture of the dynamic past which the archaeologist might be able to reconstruct from the static archaeological facts. In the model below I focus on the processes operative in an ongoing society, i.e., transportation, exchange, reuse, discard, and loss, since at present an understanding of the quantitative relationships between these processes is lacking.

### The Model

Two dimensions are particularly important in discussing the transformation of market goods into archaeological remains. They are the location of a good in space at any given point in time and the process by which the good reaches a particular location. The flowchart in Fig. 1 schematizes the passage of a commodity through a market center. The goods and commodities represented in Fig. 1 are products ready for consumption or use: raw materials might behave differently and have a different flow pattern.

The model is concerned with the nature and quantity of deposited evidence for the flow of goods and, therefore, falls under the rubric of formation theory (Sullivan 1978). It is not, however, concerned with the exact spatial point of deposition of the goods or their by-products, though for the archaeologist this may prove to be a most important consideration. For the purposes of the model an item is either deposited within the spatial confines of the market center or it is not.

Starting at the left, the good, such as a ceramic vessel, is transported into the market center to the point of exchange, the marketplace. In the transportation process and at the point of exchange, goods are subject to leakage, which refers to any process which keeps a commodity within the spatial confines of a locality, except for purchase for local use or consumption. One kind of leakage, breakage, often results in immediate discard; thus goods could enter the archaeological record via this direct route, though some broken items may be salvaged and reused (see Fig. 2). Leakage as loss (see Fig. 3) could result in immediate entry into the archaeological record (especially if the item is under one inch in length, (c.f. Gifford 1978; Schiffer 1978), though once again there is a chance that the

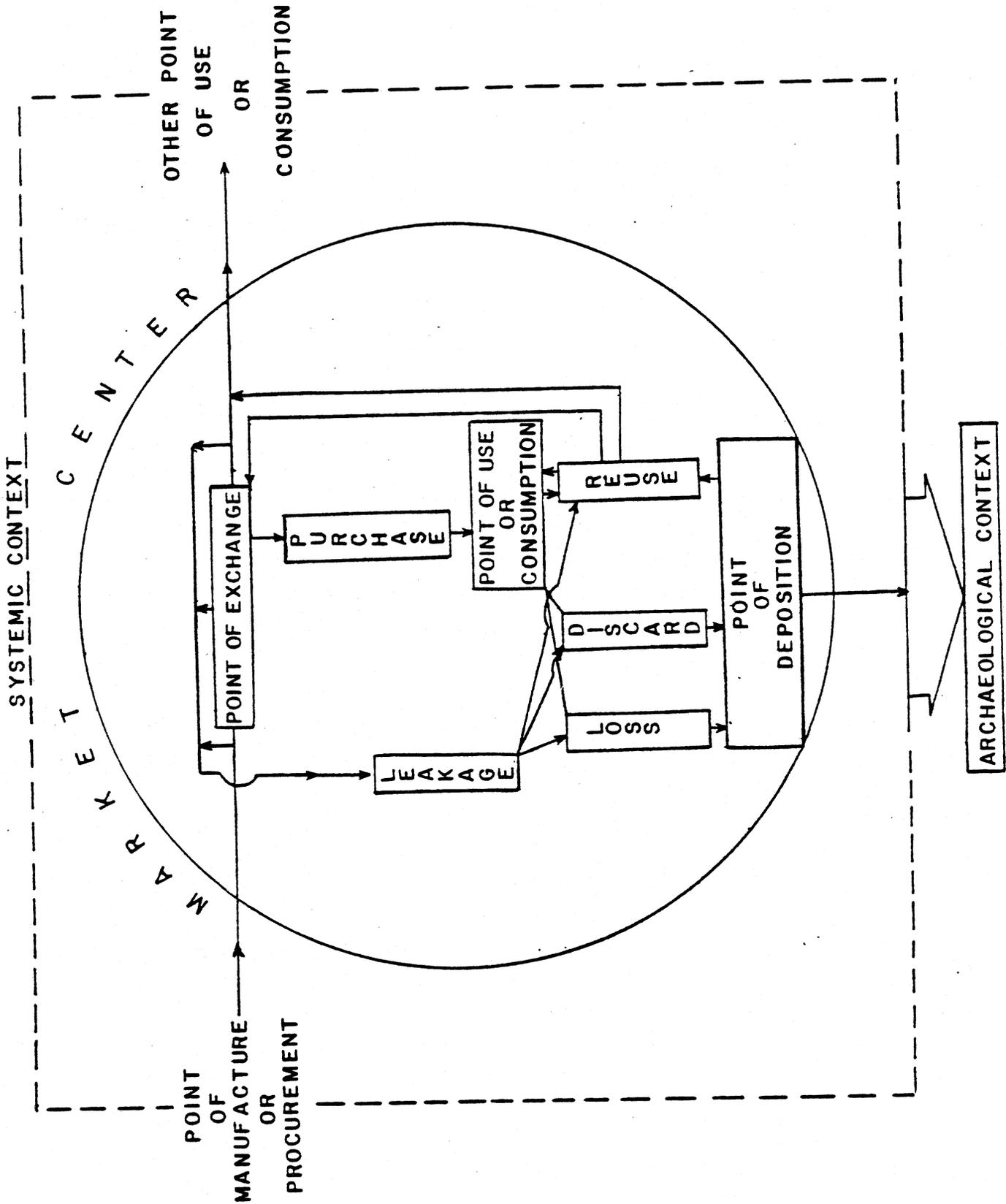


Figure 1: Schematic diagram of the flow of a commodity within and through a market center.

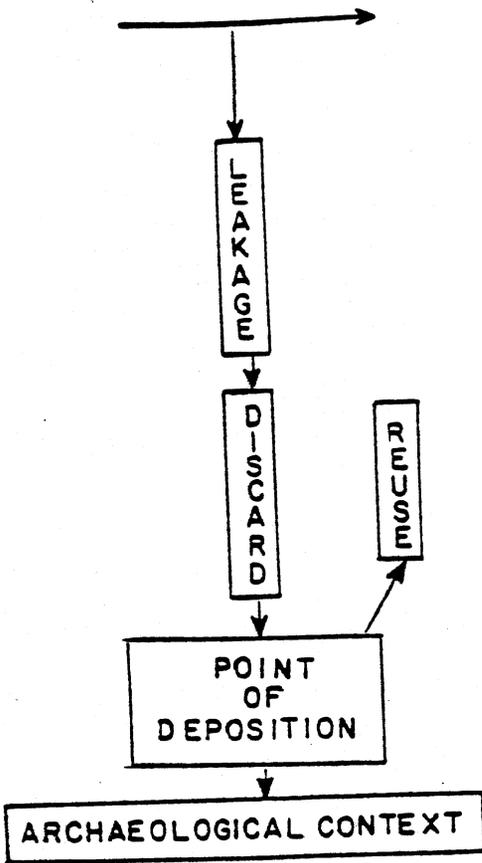


Figure 2: Leakage through discard (e.g. breakage)

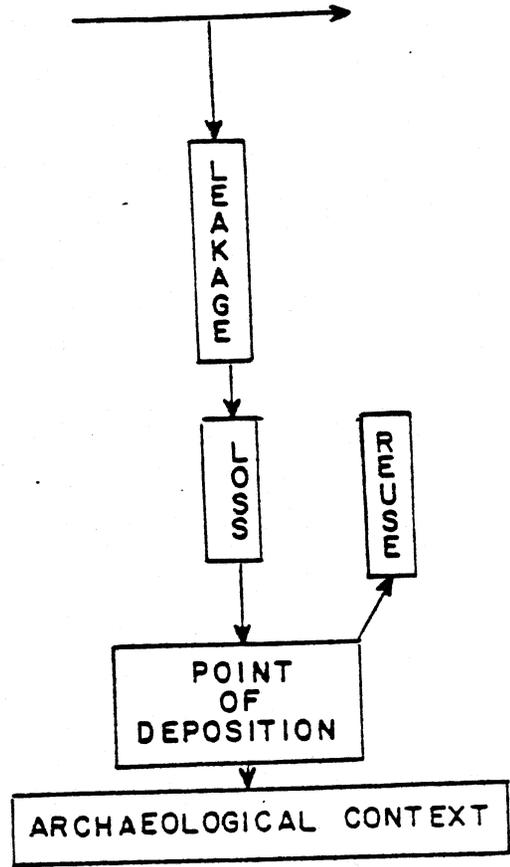


Figure 3: Leakage through loss

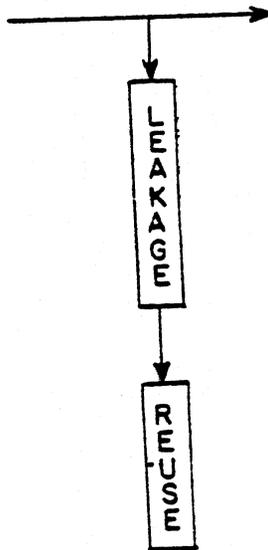


Figure 4: Leakage through reuse (e.g. theft)

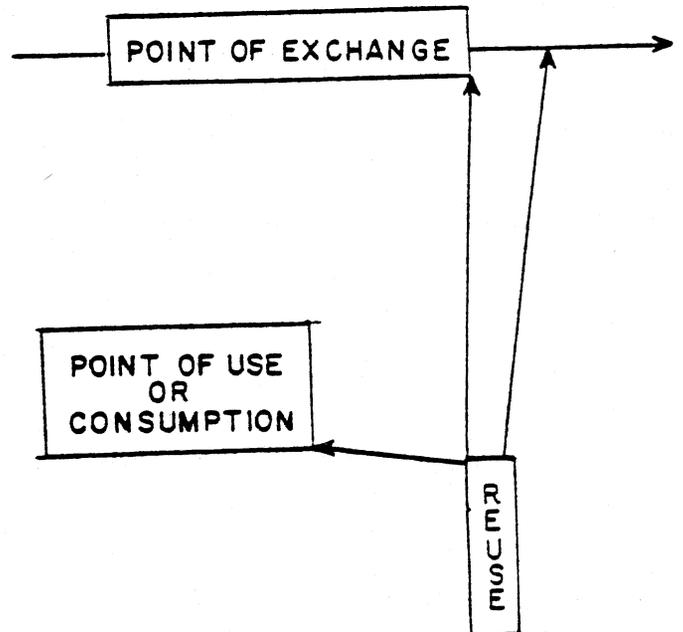


Figure 5: Alternate outcomes of reuse processes

object may be found (Fehon and Scholtz 1978) and reused. Finally a commodity may also "leak" directly into the market center through a reuse mechanism known as theft (see Fig. 4).

Schiffer (1972:158) refers to reuse as the rerouting of elements "to processes or stages through which they have already passed." Thus reuse processes, including recycling (Schiffer 1972), lateral cycling (Schiffer 1972) and secondary use (Schiffer 1976), keep commodities from entering the archaeological record as quickly as they would otherwise and can shunt items out of the local system altogether. In my model there are three logical spatial routings for goods in the reuse process (see Fig. 5). These goods may be routed: 1) to a local point of use or consumption, as in the case of the acquisition of used furniture for domestic purposes at a yard sale in the same community as that in which it was originally purchased; 2) back to the local marketplace, as in the resale of used clothing in a thrift store in the same locality as the one in which it was originally purchased; or 3) out of the local system altogether, as in the transferral of old newspapers out of a locality of sale to a distant paper factory.

Once at the point of exchange goods may either "leak," continue their journey to other market centers, or through purchase be shunted to various activity areas or points of use or consumption in the market center, e.g. households, clubs, schools, etc. (see Fig. 6). The quantity of flow of a commodity into local use will be dictated largely by the rate of purchase as conditioned by the interaction of supply, demand and price.

The quantity of flow of a used commodity or its by-product out of a point of use or consumption, if indeed there is any trace of it left whatsoever, will depend upon the rates of loss, reuse and discard for that commodity. A commodity may be lost at (see Fig. 7) or discarded from (see Fig.8)

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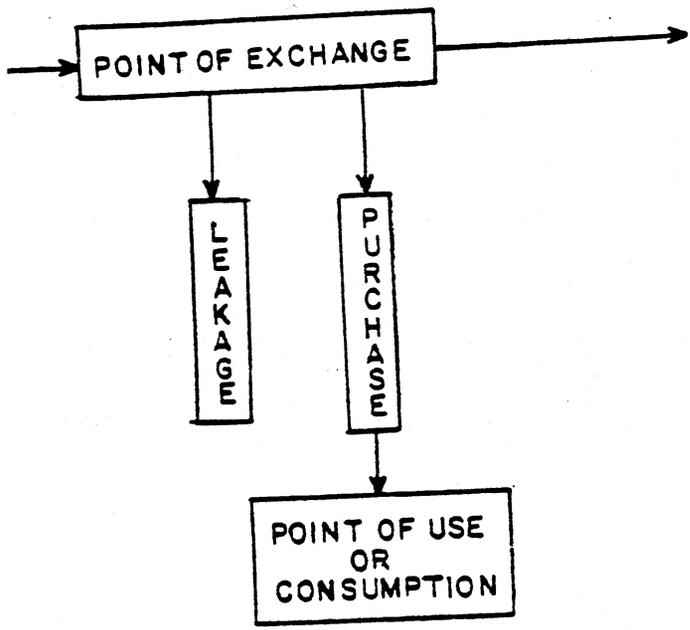


Figure 6: Use or consumption as determined by purchase

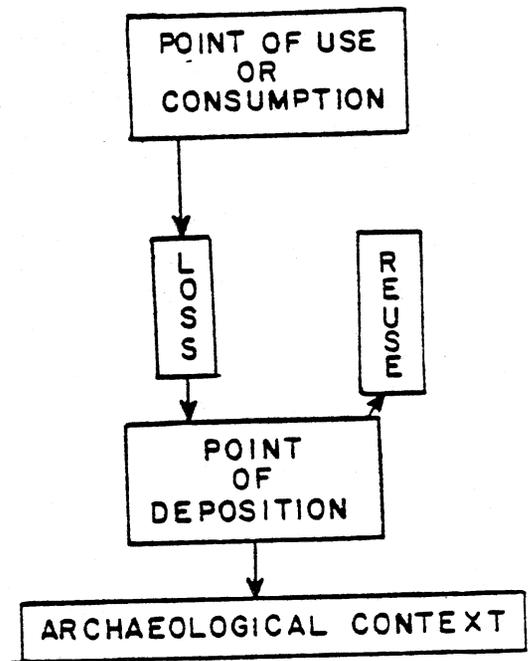


Figure 7: Loss through use

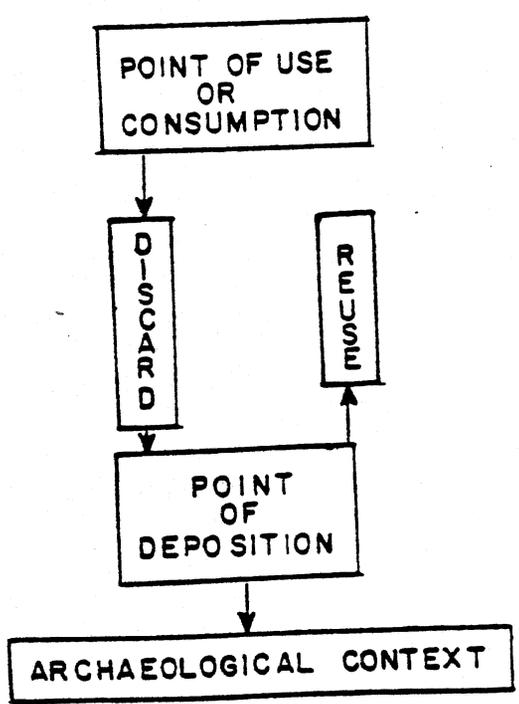


Figure 8: Discard through use or

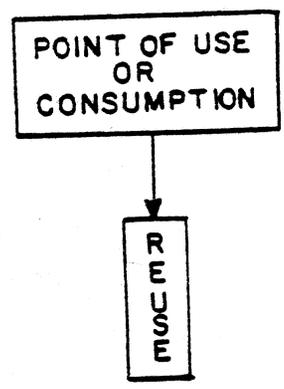


Figure 9: Reuse through use or consumption

the point of use or consumption in which case it will either directly enter the material record at the point of deposition or cycle back into the system through retrieval. Also (see Fig. 9) a used commodity could follow one of the reuse routes described above.

This model suggests that many factors may simultaneously influence the transformation of market goods into archaeological facts. Nevertheless, some generalizations phrased in terms of rates can be specified here. For instance, it is possible to say that within a market center the rate of deposition ( $R_{DE}$ ) will be equal to the sum of the rates of discard ( $R_{DI}$ ) and of loss ( $R_{LO}$ ) (c.f. also Hildebrand 1978):

$$R_{DE} = R_{DI} + R_{LO}$$

Conversely, the rate of deposition will be equal to the sum of the rate of purchase for local use or consumption ( $R_{PL}$ ) and the rate of leakage ( $R_{LE}$ ) minus the rate of non-local reuse ( $R_{NR}$ ):

$$R_{DE} = (R_{PL} + R_{LE}) - R_{NR}$$

Finally one can see that the rate of flow of goods into a market center ( $R_{IF}$ ) will be equal to the sum of the rate of leakage, the rate of purchase for local use or consumption and the rate of flow of goods leaving the market center through the point of exchange ( $R_{OF}$ ):

$$R_{IF} = R_{LE} + R_{PL} + R_{OF}$$

### Conclusion

At present, the model has limited applicability to current archaeological problems due to several factors including the archaeologist's relative inability to distinguish between the products of different processes. Presumably in the future, archaeology will be less constrained by such matters and will be able to utilize models like this one for interpretive purposes.

In the meantime I plan to test the model in an ethnographic setting since it is little more than conjecture as it stands now.

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