Models of Resource Acquisition, Transfer, Movement, and Utilization

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When Heizer and Baumhoff were at the heyday of their careers, California archaeologists were aware that prehistoric assemblages frequently included artifacts made from raw materials not occurring in their local territories. Assumptions were made that such artifacts represented trade. Since then, ideas about the scope and significance of such resource acquisitions have evolved considerably, both because of evolving understandings and the impact of new data. This paper attempts to add to understandings by increasing the number of dimensions involved to ten categories: commodity involved, source or location of acquisition, rationale for acquisition, means of collection or extraction, means of movement over space, patterns and pattern changes in movement, identification of recipients, procedures of transfer of ownership, resource modification, and subsequent use to which the resources were put.

California archaeologists have long been paying attention to trade or exchange of resources and commodities as an important dimension of past cultures. When Heizer and Baumhoff were in the heyday of their careers in California archaeology, in the 1940s to the 1960s, California archaeologists were quite aware of the occurrence in assemblages of raw materials that had been acquired from distant sources. This realization has only increased and expanded over time.

What we can learn about it depends partly on the data base in terms of archaeological samples, and partly on advances in technology which open up raw areas of data for us. It can be valuable to revisit the subject periodically to keep updating and revising our perceptions of what can be learned. Such visits will not be revolutionary, but they can be strengthening.

This paper provides a brief overview of 10 different categories of information that can be relevant to understanding what was going on in cases of trade or exchange. If we think of trade or exchange (and they are not the same) as multidimensional systems in the sense of these categories of phenomena that are involved, then we can see how change in any one category, which can occur for whatever reason, can have repercussive effects in any, or all, of the other categories. Having this sense may help us to better recognize changes in a system, to better frame questions about causation, and to better posit effective explanations. None of these categories is newly contributed, but the current literature tends not to put most, much less all, of them together in my single analysis. It is the compilation of all 10 into the same discussion that is intended to be the major contribution of this essay.

(1) *Commodity Involved.* This term refers to identifying what is being exchanged or traded. If, as a hypothetical example, lithic raw material useful for making cutting tools is involved, what are the implications if, at a site in the northwestern part of San Diego County, use of chert from the Piedra de Lumbre source in northern San Diego County (Pigniolo 1994) becomes replaced by use of obsidian from the Casa Diablo source in Mono County (Mone and Adams 1988)? To ask such a question, one must first be able to identify that such a change has taken place. In turn, such a recognition requires that the materials of an assemblage be divided in terms of what is made of a locally available raw material and what is made of a raw material that occurs only outside the territory of the polity involved. The exotic raw materials must then be classified by type, identified as to location, and quantified as to both frequency and percentage of the artifact category in the assemblage. Based on that information, the range and significance of acquired materials can begin to be understood.

(2) *Source or Location of Acquistion.* Communities that exported raw material or commodities made from raw material had to locate sources of recoverable, useful resources. Some useful resources were so widely distributed that they were accessible to a vast number of communities and never became significant exchange or trade Items. Acorns can be an example. Other materials had limited sources but widely dispersed applications, so they became desirable and were recovered and exchanged, such as abalone shell ornaments. In some cases, sources are known and evident, such as Puget Sound dentalium shells. Obsidian posed a very different situation, since more than 100 obsidian sources have been located in western North America. But which source was the place of origin for a particular artifact? Trace element analysis has allowed us to distinguish each source from others in a high degree of reliability, so now obsidian found in recipient sites can be connected to sources, and prehistoric links between origin and receiver can be reconstructed in many cases. More work is needed to expand this sourcing ability to other materials (for example, Melton 1995). Can we identify specific sources yet for clamshell beads, for example? The answer at present is that we cannot, with any specificity, in the vast majority of cases. They come from the coast, obviously, but can we distinguish beads made from shells harvested near Port Hueneme as opposed to those harvested near Goleta, or near Malibu, or ones from Santa Cruz Island as opposed to

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Santa Rosa Island? We cannot do so yet, but possibly an approach such as DNA analysis might narrow such source ranges considerably.

(3) *Rationale for Acquisition*. The motivation for acquisition is not something that is necessarily discoverable archaeologically. Ethnographic analogy can be especially helpful in this regard. It can be possible to identify several possible motivations, however, and, through testing, to eliminate some or most of them. If, for example, an acquired raw material does not occur in the territory of the receiver, then it can be identified as an exotic material. That still leaves open possibilities that it was desired by the receiver, such as being exotic or being a religious or a status symbol, but it also might reflect a social relationship in which the presenter was making a gift to the receiver, and it was the presenter's choice rather than the receiver's choice, as through balanced reciprocity. If a material passed through several ethnic groups before it reached the receiver, that pattern would be more consistent with economic rationales, such as exchange (see, for example, Gould 1978:132-133; King 1978:62).

(4) *Means of Extraction for Acquisition*. This term refers to procedures and technologies used to recover, harvest, or otherwise obtain the raw material involved from its place of origin. For example, steatite was extracted on Santa Catalina Island, both for local use and for export. Steatite export began during Archaic times though it expanded during the Late Period. What technologies needed to be developed to enable Archaic Period communities on Catalina to extract steatite successfully? Did those technologies change over time, and, if so, did the changes affect the extraction and export rates of the resource (see, for example, Meighan 1959)?

(5) *Methods of Movement Over Space*. Today there are many ways to transport things, from personal automobiles to trailer trucks to bicycles with baskets to railroad cars to airplanes to pipelines, and so forth. Prehistorically there were far fewer means, and that fact affected what was moved, in what quantities, and to what distances. For example, blocks of obsidian, perhaps weighing up to 5-10 kg, could be carried by individuals overland for long distances. Blocks of basalt weighing 50-100 kg could not. Thus long-distance trade in large milling slabs was not a major economic activity.

On the lower Klamath River, at places such as the Kepel fish dam, a family participating in the annual salmon run catch might bring several hundred kilograms of smoked salmon back to its own house in another village by means of a canoe or raft (Chartkoff and Chartkoff 1984:153, 327). By contrast, the hauling of thousands of kilograms of smoked salmon over the mountains to trade with another society that didn't have access to major salmon catches was not a functional option. Lightweight commodities, however, that could be backpacked by individuals, such as baskets, jewelry, or medicinal herbs, could be carried across the mountains readily enough to other ethnic territories and could be used for trade (Pilling 1978; Waterman and Kroeber 1938). It was not just the scarcity of an item or its utility, but its transportability that allowed it to be a functional exchange material. As a parallel, many seasonally migratory communities in several parts of California made use of bedrock mortars and bedrock milling slabs that were not at all movable. To use them, however, pestles and hand stones or manos were used, and in some cases those hand tools were portable and were moved from one temporary campsite to another (Chartkoff and Chartkoff 1984:157).

(6) *Patterns and Pattern Changes in Movement*. This element leads to another dimension — the patterns of movement of resources and commodities between points of origin and recipients. Regular movement of materials between communities creates patterns, both for the individual materials and for the interacting communities. What are the patterns of movement of resources and commodities that developed over time and space? How are individual patterns related to each other? What are the total patterns evident for a particular resource or commodity? Answers to these questions form the key to reconstructing relationships over time and space, both for documenting continuity in relationships and for documenting change in patterns (e.g. Dietler 2004; Pigniolo 2004). We need this information to be able to frame specific questions about what happened, so we can then frame specific follow-up questions about how and why there was continuity, or there was change, at specific times and places.

For example, how did language patterns relate to exchange patterns (e.g. Zepeda 2004)? When the Yurok and the Wiyot moved west from the Great Lakes to the lower Klamath River and adjacent Pacific Coast, for example, how did their arrival affect previously existing exchange patterns? How did local exchange patterns get rebuilt? Aspects of these questions have been discussed over the years, but what would we see if total exchange inventories were reconstructed for the lower Klamath River and adjacent coast on a century-by-century basis for the last 4,000 years of prehistory in the area? We could look at the displacement of Yuki speakers by Athapaskan immigrants, or the impact of Shoshonean expansion to the southern California coast, or several other cases, too (see, for example, Fredrickson 1984:481-491; Lightfoot 1996:1-3).

(7) *Identification of Recipients*. This category may seem especially obvious, but it has real significance. It is not just the source of an item that is important to know, but also its destination. Identifying the receiver is a consequence of archaeological analysis, since analysis applies to what is found. Nevertheless, it is the analysis of whole assemblages that can lead to the recognition of what objects or materials could have come from local sources and which ones must have come from other territories due to identification of possible sources. Given the specialization that is required in the skill areas of any source analyst, it is hardly surprising to find that

particular scholars tend to put particular emphasis on particular raw materials and/or commodities. Just as one example, Jeanne Arnold has done outstanding work in the analysis of shell bead manufacturing and dispersal, while Tom Origer has done equally outstanding work analyzing obsidian (for two examples, see Arnold 1992; Origer and Wickstrom 1982). Such work is extremely necessary and valuable. At the same time, though, there also is tremendous value in developing holistic, comprehensive pictures of the complete pattern of resource movements among series of communities, both over time, and over space at the same point in time. A particular community may serve as an end-destination for some commodities, and an intermediate transfer agent for others. It is important to know what roles each community played for what resources or commodities (e.g., Hughes 1992).

(8) *Procedures of Transfer of Ownership*. This topic also is important, but can be very difficult to derive strictly from archaeological data. Ethnographic analogy may be more useful here (for example, see Margolin 1978:96-102). Some transfers involve gift-giving among relatives as a form of generalized reciprocity. Some may involve presentations by power figures as a form of centralized redistribution, such as in potlatch-like system. Some transfers may involve negotiated trades or purchases as a form of negative reciprocity, such as the use of the shell bead money system. Shell money systems tend to leave archaeological evidence for their existence, while generalized reciprocity tends not to do so, which is why the application of ethnographic analogies can be especially helpful (see, for example, Kottak 2004:441-448).

(9) *Resource Modification*. The movement of resources and commodities is one thing. What was done with them is another. Both elements are vital. One dimension involves what was done with resources after acquisition in terms of modification by the recipient. In some cases, extracted resources may have been converted to manufactured commodities by the extractors before transfer took place, so that the transfer involved the produced commodity at least as much as the material from which it was made. Such was often the case with basketry in northwestern California, for example. In other cases, the raw, material was left unmodified and was transferred as a raw material, left unmodified or minimally modified (such as shaping large bifaces out of chert or obsidian), and the finishing was done in the recipient community. Archaeologists have long had the capability of recovering evidence of some kinds of tool finishing, such as debitage from stone tool manufacture or bone punches for leather work, but we don't tend to focus very much on whole arrays of craftwork byproducts at many sites. This is another area in which ethnographic analogy can be quite useful for model-building, although ethnographically based model-building also fosters the creation of productive hypotheses by archaeologists (see, for example, Garfinkel et al. 2004).

(10) *Subsequent Uses of Resources or Commodities*. A related but still distinct category involves the uses or applications to which acquired resources were put. Modification is one factor, but application is another. For example, among the Hupa, tan deer skins were used for making clothing and other practical items, but skins of albino deer were used for religious purposes in the White Deer Skin Dance (e.g. Chartkoff and Chartkoff 1984:199; Wallace 1978:159, 171, 174). A particular item might be used for household functions, or it might serve as an indicator of social standing, as with some basketry. Variations in use can occur with locally produced artifacts as well as artifacts made from exotic or acquired materials. Again, ethnographic analogy can be a valuable aid if not a perfect one in this pursuit, but it is important in helping to illuminate the meaning, value, and significance of items.

CONCLUSION

As noted previously, none of these items is a new creation, but their value is putting them together in a set. Although exchange has been a subject for many writers in California archaeology, by enriching the dimensions that are examined, our understandings can be significantly deepened.

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