THE UPPER RIO SONORA VALLEY IN PREHISTORIC TRADE

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ABSTRACT

Results of recent archaeological research in the upper Rio Sonora valley are discussed, presenting data on local settlement-subsistence patterns, non-subsistence patterns, non-subsistence agriculture and related activities, community architecture, including the presence of possible ball courts, and the existence of a ranked society in northeastern Sonora in late prehistoric times. A network of external trade, dominated by economic relations with Casas Grandes, is postulated.

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This paper is based on a project being conducted at this writing in northeastern Sonora, Mexico, by the University of Oklahoma.[1] One of the primary goals of the project is the identification of trade routes and the nature of trade systems that were active between Mesoamerica and the classic Southwest, i.e., the Southwest north of the international border.

In the current debate in archaeological theory and method, I find myself in general agreement with logical-positivism and a theoretical framework based on the principles of general systems theory. In addition, I prefer the hypothetico-deductive method as a means of testing inferences whenever possible and/or practical (Tuggle, Townsend, & Riley, 1972; Hil, 1972; Watson, LeBlanc, & Redman, 1971).

The value of this approach has been demonstrated in a number of studies (e.g., Flannery & Coe, 1968, 1970, 1972; Longacre, 1968; Struever, 1968; Thomas, 1973). The systems theorists view human populations as components of ecological systems, doing away with the artificial boundary between culture and nature. Systems are understood in terms of the relationships between the components. Hence human behavior is the expression of part of the relationship between the human component and the rest of the system. It is only a part of the relationship, since the system is characterized by feedback, which in turn affects the human component.

While retaining the notion that human behavior is patterned, systems theorists reject the concept of culture as a set of shared ideas. The latter concept implies that all members of a given society share equally in the set of ideas that define the culture, whereas it is recognized that different persons exhibit different behaviors in different situations, and not everyone participates in all activities. Thus, culture is a shorthand notion for the sum of activities, but the latter represent relationships within sub-systems which overlap in the human component.

While subscribing to this theoretical approach, I am nevertheless in disagreement with many of its adherents in terms of its application, at least insofar as Southwest is concerned.

In past years Southwestern archaeologists have tended to treat the Southwest in isolation, looking to external Mesoamerican sources only for the initial introduction of a few basic traits such as maize and pottery. A number of explanations for this phenomenon have been offered. Taylor (1954:566) has suggested that Kidder was greatly influenced by the culture area concept and in turn influenced the subsequent direction of Southwestern archaeology along geographic, or areal, lines. Rouse (1954:573), commenting on Taylor's thesis, suggests an alternative, that Southwesternists were more influenced by the concept of traditon, tracing the spatial-temporal histories of archaeologically defined culture units such as the San Juan Anasazi or Hohokam.

I suspect both Taylor and Rouse are correct. Certainly a rather limited notion of the geographic Southwest conditions the thinking of most scholars considering themselves Southwesternists. A

review of the literature reveals numerous discussions concerning the relationships between Mesa Verde and Chaco Canyon; the Sinaqua, Salado, and Hohokam; and the various branches of the Mogollon. Yet in a recent, mis-titled synthesis of Southwestern prehistory the great site of Casas Grandes is not even mentioned, although a mere 65 miles south of the border (Martin & Plog, 1973). Indeed, maps of the Southwest presented in a number of such syntheses reveal a remarkable historical coincidence, namely that the southern border of the Gadsden Purchase exactly corresponds to an anthropologically defined prehistoric culture area (e.g., McGregor, 1965; Martin & Plog, 1973).

At the same time, the nature of southwestern antiquities, the elaborate ceramic typologies, the architecture, the availability of dendrochronology, the excellent preservation of perishable materials, and the evident continuity of prehistoric cultures with historic pueblos, all conspire to make it relatively easy to construct local developmental sequences. The latter in turn make it appear unnecessary to look beyond the local area for explanation, since each phase seems to have its antecedents in immediately preceding phases. When such was not the case, there was always the thought that many portions of the Southwest were yet to be explored and held the missing data.

It must be remembered that when the above trends in Southwestern research were developing, Mesoamerican archaeology was also in its infancy some 1000 miles away, with unknown territory lying between. It is not surprising that for an archaeologist excavating a seemingly perfect sequence from primitive Basketmaker to classic Pueblo, the Valley of Mexico seemed remote and irrelevant.

Whatever the reasons, the fact remains that Southwesternists from early 1920s until recently have devoted themselves to "filling in the gaps," as Taylor put it, within the Southwest north of the border.

There have been a few notable exceptions to the above. In 1932 Beals published his concept of the "Greater Southwest," which added all of northwest Mexico to the Southwest culture area. Haury (1945) discussed diffusion corridors through northwest Mexico, while Ferdon (1955) noted architectural parallels between Mesoamerica and the Southwest, postulating direct Mesoamerican intervention as an explanation.

More recently such scholars as Kelley (e.g., 1966, 1975), DiPeso (1974), Haury (1976), and Weigand, et al (1977) have argued persuasively for the view that the Southwest was heavily influenced by Mesoamerica, some even suggesting the actual presence of Mesoamericans as far north as Chaco Canyon. DiPeso has made a strong case for the interpretation of Casas Grandes as a Mesoamerican trading center, with links across the sierras and southward to the Mesoamerican frontier in Sinaloa.

The period when these recent developments in the study of Southwest-Mesoamerican interaction were coming about happened to coincide with the very time when a number of young, and not so young, innovative archaeologists were introducing to the field their notions of logical positivism, general systems theory, and the hypothetico-deductive method, with the lofty claim that their approach had the power of finally converting archaeology from culture history to science. Their persuasive, and often polemic, arguments for this point of view are characterized by an emphasis on clearly stated premises and the rigorous testing of propositions. It is therefore surprising to find the Southwestern practitioners among them continuing to follow the isolationist tradition of their predecessors in the face of the abundant evidence which has been compiled and reported on Southwest-Mesoamerican interaction.

It is here that I begin to find myself in disagreement. Since my research strategy is founded on the same body of general systems theory and methods of testing, it is relevant to examine how it is that the goals of my Sonoran research can be so far removed from the interpretations of the Southwest offered by others using ostensibly the same theoretical approach.

Martin and Plog's (1973) comprehensive study of the "Southwest" will be used as a foil since it represents an attempt at synthesis based on the theories discussed here; it represents the neo-

isolationism noted above; and because the authors felt compelled to devote a chapter to the explicit denial of external influences as relevant to an understanding of the Southwest.

Hall and Fagen describe a hierarchical order of systems, such that any system can be divided into subsystems and any system is itself a subsystem of a larger system (1968:83-84). In effect, in order to deal with phenomena systemically, we must first identify the system, and the very act of doing so is synonymous with placing artificial boundaries around a subsystem of a larger system. The environment of a system is defined by Hall and Fagen as "the set of all objects a change in whose attributes affect the system and also those objects whose attributes are changed by the behavior system" (Ibid:83). Hence, when we bound a subsystem, the larger system becomes the environment by definition.

It should be obvious that interaction takes place between subsystems and the larger system, as well as between subsystems. This is because the larger system, and all its remaining subsystem components, are part of the environment of the system in question. However, when dealing with a given system, we need not necessarily be concerned with the nature of the larger system of which it is a part, but only with the inputs from the larger system, as well as the outputs from the system in question. If we define a light switch, wires, and ceiling light as a system, we need not concern ourselves with the power plant generating the requisite energy or the system of transmission lines, but only with the input of energy through the switch. However, this cannot be stated as an absolute rule. In some cases we may well need to consider the nature of the larger system in order to understand the inputs for the system in question.

In reference to interaction between local groups, Martin and Plog (1973:331) make the observation that "human cultural systems are not closed; substantial quantities of matter, energy, and information cross their boundaries. To the extent that these flows are significant between two systems, events in one will affect events in the other."

Such a statement is in complete agreement with the preceding description of system relationships. It should be noted, however, that Martin & Plog make this observation in reference to relationships between communities in marginal and nonmarginal areas within the Southwest. When it comes to inputs from beyond their borders of the Southwest, i.e., Mesoamerican inputs, they drop their systemic model entirely and argue in terms of diffusion and migration, citing Harris' contention that diffusion explains nothing. Implicit here is the non-stated premise that inter-cultural relationships within the Southwest are systemic while similar relationships extending beyond the Southwest are non-systemic. Hence we are told that relationships with Mexico are of little concern because they are "of historical more than explanatory interest" (Ibid:345).

I suspect that the failure of system theorists in the Southwest to recognize the relevance of Mesoamerica to their research is a function of the units of analysis they define, such as Hohokam, Anasazi, and Mogollon, or smaller geographic entities such as Chaco Canyon and Mesa Verde. The latter may well be derived from the old expeditionary attitude described by Taylor (1954). But given their apparent understanding of systems theory, how is it possible for Martin and Plog to discuss cogently the interaction between local groups (systems) and yet fail to recognize the obvious extension of such a model to larger systems? The answer, I believe, is revealed in the following passage:

> Certainly we may be able to learn a bit about historical development in Arizona by studying diffusion, but as a concept or a model for studying sociocultural changes or for searching for regularities, for questions concerning casusality and origins, or *for applying the principle of technoenvironmental determinism,* it is inadequate precisely because one cannot test its implications for explanation and prediction (1973:339-340; italics mine).

While generally claiming an affinity with anthropology, with all its goals and aims, most archaeologists using systems theory argue in terms of explaining prehistoric phenomena. I see this as particularistic, whereas anthropology is said to be a generalizing science. While it is perfectly legitimate to have an historical interest in prehistory, as anthropologists our concern with

prehistory is as a data source for generating and testing models of explantion as opposed to applying such models. Thomas exemplifies this point of view in his test of Steward's model of Great Basin settlement patterns (1973).

Leaving aside the incredible statement that the implications of diffusion cannot be tested, Martin and Plog in the above passage expose their concern with explaining the prehistory of the Southwest by application of the principle of technoenvironmental determinism.

The application of the hypothetico-deductive method, as correctly noted by Binford (1968), Hill (1972), and others, calls for the testing of numerous, contrasting propositions, not just one. Southwestern proponents of this approach are often guilty of violating this tenet. Martin and Plog are specific examples, explicitly subscribing to the explanatory devise labelled technoenvironmental determinism. They do not set forth this concept to be tested against the data of prehistory, but rather apply it as it a given. Furthermore, implicit in their interpretation of the Southwest data is a restriction on the concept. There is no inherent contradiction between technoenvironmental determinism and the notion of world systems. Their rejection of external factors as having no significant influence on the development of Southwestern cultures, in spite of abundant evidence to the contrary, clearly implies that what they really mean is *local* technoenvironmental determinism. Unfortunately, since they are apparently unaware of this unstated premise, they also fail to define its geographic and/or socio-cultural limits. In other words, how local is local?

Because of their hidden premise noted above and the fact that they are simply applying the principle as a given, Martin and Plog are able to reject out of hand all data pertaining to external inputs as irrelevant. From their premise such rejection logically follows, and they cannot be faulted for that. However, had they been concerned with setting forth their premise as a proposition to be tested, and hence followed through with the testing of alternative propositions, they would have been forced to consider the Mesoamerican data. Instead, while explicitly recognizing relationships between cultural systems within the Southwest, they fail to recognize that interaction between these systems and Mesoamerica represents the same kind of phenomena. Our proposal of a Mesoamerican world system, adapted from Wallerstein (1974; Pailes & Whitecotton, 1975), and our subsequent research in Sonora, is an attempt to remedy this situation.

Based on an analysis of the rise of European world economic dominance beginning in the sixteenth century, Wallerstein has proposed a model of world economics which describes the systemic relationship between the various components of what he calls a world system. He defines four components: the core, semiperiphery, periphery, and external arena. The first three together make up a system which is integrated economically but does not have political autonomy. Each of the three components is distinctive, and each serves specific functions necessary for the operation and maintenance of the system as a whole. Both political and economic power are unequally distributed among the three components, with the core area being dominant. In addition, the three components are themselves subdivided into a number of socio-cultural units. Hence the core area does not represent a single polity, but a number of economically and politically competing states. The external arena consists of those socio-cultural units which are outside the system, although in contact with it. An important point here is that, because the external arena is by definition not a part of the system in question, it is unaffected by it. Contact between the external arena and the system is sporadic, brief, and characterized by the acquisition of windfall profits on both sides.

Following Wallerstein's model, a Mesoamerican world system has been suggested with the Southwest as a peripheral area (Pailes & Whitecotton, 1975). One of the long range objectives of our Sonoran research has been to test this model archaeologically.

Evidence for intermittently intensive, but continuous, contact between Mesoamerica and the Southwest has been abundantly provided in a number of references previously cited. One problem has always been to identify the actual mechanism for all of this Mesoamerican-Southwest interaction. The most frequent response has been to invoke Pochteca-like trading groups as the guilty parties responsible for contaminating our pristine Southwestern sites with Mesoamerican stuff. This

has the happy advantage of allowing us to leap a thousand miles in a single bound without worrying too much about all that archaeologically unknown territory in between.

The project discussed here was in part designed to try to understand more about the actual mechanisms of interaction that were taking place in pre-Spanish times. The continued uncovering of Mesoamerican traits and/or trade items within the Southwest itself, while serving to reinforce our conclusion that the Southwest was indeed a peripheral area in a larger world system, does not alone define the nature of the system. By examining the intervening areas we hope to uncover evidence that will at least allow us to identify the kind of trade systems that were active.

We chose eastern Sonora because:

(1) It was one of those unknown intervening areas, a virtual blank on the archaeological map.

(2) The author had previously found evidence for the existence of a more or less common cultural tradition extending the entire north-south length of eastern Sonora and northwestern Chihuahua, from Casas Grandes all the way into northern Sinaloa, where it was in direct contact with Mesoamerican culture on the west coast (Pailes, 1972, 1976).

(3) The area just happens to straddle the best north-south routes of travel on the west side of the sierras.

If the eastern Sonora foothill zone did serve as an ongoing diffusion corridor between Mesoamerica and the Southwest, evidence should be found in the Rio Sonora culture sites in the form of specific trade items and locally made items not directly related to subsistence requirements, but derived from Mesoamerican and Southwestern sources. Such a proposition is relatively easy to test, and our data have already done so.

The abundance of trade pottery from Casas Grandes province indicates that trade into or through eastern Sonora was extensive, while marine shell from the coast and various Mesoamerican items such as copper crotals, Guasave Red pottery, a number of typologically unidentified sherds of west Mexican origin, and effigy vessels indicate interaction with peoples to the west and south. Determining the nature of such interaction is more difficult.

Following DiPeso, we postulated that Casas Grandes was a northern terminus for a trade route which passed through eastern Sonora. Our concern has been with determining whether the exchange system was based on a group of long distance traders comparable to the *pochteca,* or based on a system of numerous, overlapping local trade networks, or both.

Two approaches are being used. In the first, we constructed a simple typology of trade systems, consisting of four types each characterized by a different means of trade goods transmission and different concomittant social relations (Pailes, 1978).

Type one consists of a series of overlapping local trade networks which were socially egalitarian, i.e. anyone who had a mind to could engage in trade. Type two also consists of a series of overlapping trade networks, but contrasted with the first type in that locally the system was characterized by social stratification, with the exchange of trade goods controlled by the elite.

Type three is characterized by long distance traders who, alone, travelled between distant points. The difference between this type and the next lies in the origin and cultural background to the traders. In this case, they would be natives of the Southwest, peripheral to Mesoamerica. The fourth type also features long distance trade, but characterized by traders from Mesoamerica, specializing in trade with distant peoples. The well know Aztec *pochteca* serves as a model here.

It is postulated that each of the above types of economic exchange would result in distinctive spatial distributions of trade goods relative to community and settlement patterns. Undoubtedly the actual situation was more complicated than the four types suggest. For one thing, there is no logical reason why more than one type could not have been operative at the same time. Even types one and two are not necessarily mutually exclusive, since each could involve different sets of trade goods. Nevertheless, we have attempted to predict trade goods distributions based on the above types for comparison with the actual situation as we find it.

The second approach to this problem again involves settlement pattern data. Using all of our

data on site size, site content, population estimates per site and for the valley as a whole, and environmental variables, but specifically excluding the settlement pattern, we are attempting to construct an expected settlement pattern model. This we are then comparing with the actual settlement pattern as we find it. Since the expected pattern is based entirely on internal factors, if it is at all accurate then anomalies in the actual pattern should be the result of external factors. The nature of the anomalies will then be used in conjunction with our first test of the four types of exchange.

Since the project is far from completion, it is too early to present conclusions. Nevertheless, some patterns are beginning to emerge. In the remainder of this paper I will briefly describe some of these data and their possible implications.

The area of research is in northeastern Sonora, taking in drainages of the upper Rio Sonora, Rio Fronteras, Rio Moctezuma, and Rio Sahuaripa (Fig. 1). These valleys all lie in what we have termed the eastern foothill zone of Sonora, above the 15 inch isohyet for mean annual rainfall. The rivers are all live streams, although some, such as the Rio Moctezuma, have alternate live and dry sections. This is in contrast to the rivers to the west, which are ephemeral, flowing intermittently only during the rainy season in summer. In addition, the foothill streams are all oriented on a north-south axis, and together with the Rio Cedros and Arroyo Cuchujaqui in southern Sonora, they form a north-south corridor from northern Sinaloa to the international border. The area can be considered a transition zone or ecotone between the Sierra Madre Occidental on the east and the Sonoran Desert on the west.

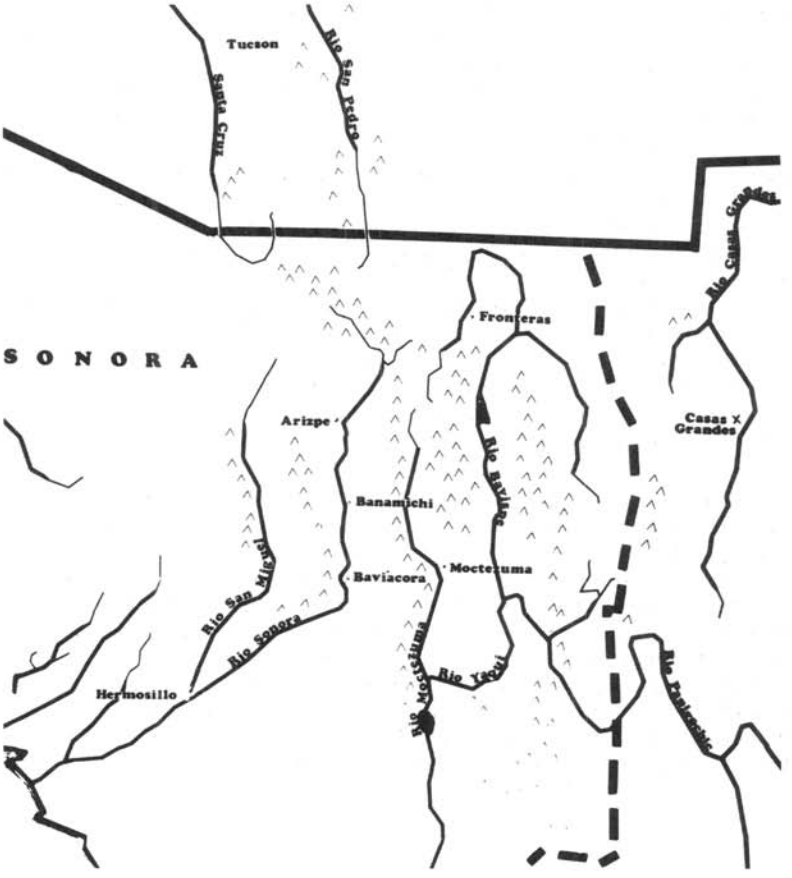

Fig. 1. Map of northeastern Sonora, showing the research area.

Our research efforts have been concentrated in the upper Rio Sonora valley, with some survey and test excavations in the remaining valleys both to obtain comparative date and to check some of our interpretations. The Rio Sonora valley can be divided into a number of more or less naturally defined segments characterized by a broadening of the floodplain. Two of these segments we call the Baviácora-Aconchi and Huepac-Banamichi segments after the principle towns in them.

The initial field season was devoted to site survey throughout the area, but with a concentration on the Rio Sonora valley. An intensive survey was conducted in the southern half of the Baviácora-Aconchi segment, with an effort made to locate every site. The data gathered was then used as a basis for conducting a more general survey throughout the remainder of the research area. In succeeding seasons the site survey was assigned to an advanced graduate student in geography having experience with archaeology, and the survey was continued concurrent with excavations. We now have as complete an inventory of sites as we can hope to obtain for the Baviácora-Aconchi and Huepac-Banamichi segments of the valley, and less complete surveys north of Banamichi as far as Arizpe and south of Banamichi as far as Molinote some twenty kilometers away.

To date we have recorded 279 sites, with controlled collections from roughly two thirds of them. The remaining one third were of such a nature that controlled collecting procedures would have been impractical for a variety of reasons. In the upper Rio Sonora valley, where our research has been concentrated, a total of 253 sites have been surveyed.

In the combined Baviácora-Aconchi and Huepac-Banamichi segments of the valley we have 227 prehistoric or very early historic sites. Of these, 162 appear to have been permanent habitation settlements which are consistently found on the edge of the lower bajada overlooking the river floodplain or large tributary arroyos. The remaining 65 sites consist of check dam sites, isolated clusters of roasting pits or debris scatters probably representing seasonal activity sites.

The project geographer has developed some tentative interpretations concerning the settlement pattern in these two segments of the valley which seem to check out positively in other parts of the research area. The 162 habitation settlements fall into three groups, based on size, house number, and the presence of special architectural features.

Three sites dominate the pattern by their size, having 85 or more structures, the largest having in excess of 125 observable structures. One of these, the San José site, is centrally located in the Baviácora-Aconchi segment of the valley. The Huepac-Banamichi segment is twice as large, and is dominated by two large sites, the Las Delicias del Sur site in the northern half and the Ojo de Agua site in the southern half.

There are only two intermediate size sites. One is located on the west side of the river floodplain at the north end of the Huepac-Banamichi segment. Its size seems to be a function of local topography. The second is the La Mora site, which is located on the edge of the lower bajada central to the Huepac-Banamichi valley segment, midway between the two large sites. It is unique due both to its intermediate size and to the presence of public architecture.

The remaining 157 habitation sites are all small, having fewer than 20 structures, with 100 having fewer than five structures.

Finally, the large San José site in the Baviácora-Aconchi segment and the intermediate sized La Mora site in the Huepac—Banamichi segment have large public structures consisting each of two elongate parallel platforms with plaze-like areas between them. At the San Jose site the two platforms are connected at their ends by crosswalls to form a rectangular interior court or plaza (Fig. 2). The interior dimensions are twenty-four meters from platform to platform and forty-six meters from end wall to end wall. The platforms, and hence the long axis of the entire structure, are oriented a few degrees west of north, paralleling the edge of the mesa.

The east platform is approximately one meter high in its present condition, and two and a half meters across (Fig. 3). At the southeast corner of the structure, the east platform extends some ten meters beyond the south crosswall, its entire length being some fifty-six meters. Its exact length cannot be determined due to vandalism at the south end.

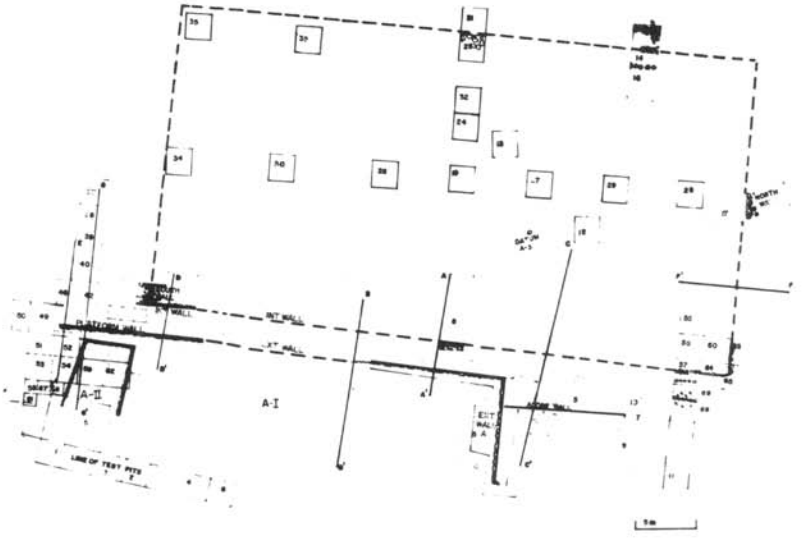

Fig. 2. Structure A-I, the court-platform structure at the San José site. Dash line indicates outline of structure. Small circles indicate rocks. Fine solid lines indicate excavation areas.

Fig. 3. East platform, looking south on top of the platform. On the left can be seen the exterior edge of the platform after excavation. On the right a trench extends against the interior wall. In the background on the right can be seen the sloping talus from the platform before excavation.

Fig. 4. Interior wall of court-platform structure at San José.

The platform was constructed by building three parallel stone walls and filling the space between the two most distant with rocks and trash. As a result, the middle wall was buried within the platform. The interior wall, i.e., facing the interior court, was crudely constructed of boulders, but may well have been finished with adobe plaster that has since melted away (Fig. 4). The middle wall, buried within the platform, consisted of a linear pile of boulders noticeably larger than the other rocks making up the general fill of the platform.

The exterior wall, i.e., on the east face of the platform was faced with flattish rocks placed on edge for the southern two thirds of its length. At this point a wing wall was constructed extending eastward from the platform. The slab facing along the east wall of the platform continued along the wing wall, while the remainder of the platform north of the wing wall had an exterior finish similar in construction to the interior wall. A plaza-like area appears to have been present adjoining the platform on the east and south of the wing wall. At present this area is noticeably level and lacks architectural features of any kind.

The west platform was built along the edge of the mesa where its position facilitated its more rapid erosion. Hence, in its present condition it is not as high or clearly identifiable as is the east platform. Two trenches sectioning the west platform confirm that it was constructed in a manner similar to the east platform, but lacked the slab facing on its exterior side.

The end walls on the south and north were of simple boulder construction, approximately one-half meter wide.

At its south end, the extension of the east platform was constructed over the ruin of a former rectangular surface structure, and evidence suggests that the latter was deliberately razed to make way for the platform construction. Finally, near the south end of the east platform was a small, U-shaped surface structure opening to the east.

At the La Mora site,more or less centrally located in the Huepac-Banamichi segment, was found another structure similar to the court-platform structure at San José. Since this structure has not been excavated, dimirsions are approximate. The interior court is some twenty-five meters wide from platform to platform. However, the platforms extend only about two-thirds the length of the long axis of the court. The remaining one third is bordered by rock alignments representing a continuation of the exterior walls of the platforms, so that the court area is in the shape of a T. In place of the end walls found with the court-platform structure at San José, the La Mora structure has the foundations of two rectangular surface structures, one at each end. The distance between structures, and hence the length of the interior court, is forty-five meters.

The settlement pattern data tend to indicate that there was no central place hierarchy within each of the valley segments, but that the large sites served all other sites with no intermediate sites functioning as secondary centers. On the other hand, the La Mora site suggests that whatever economic and/or political functions were served by the dominant sites, they were apparently distinct from the functions served by the court-platform complexes, at least in the Huepac-Banamichi segment.

Thirty-four sites have been partially excavated in the course of the project, providing data from 59 structures and numerous test pits. A part of two seasons were devoted to the San José site because of its obvious importance. The site is approximately .25 km² (61.75 acres) in size and has in excess of 100 structures visible on the surface in addition to the court-platform structure noted above.

At this point we are able to identify tentatively at least four occupational phases at the San José site, based on the architectural sequence. The earliest two phases are characterized by houses in pits, and can be distinguished from each other by certain details in one of the houses. This was a house in a pit, approximately eight and a half by five meters, and about 90 centimeters in depth. Significant attributes for identification of the early phase are the presence of a plastered, sloping entry on the west and a plastered floor (Figs. 5 and 6). The house was destroyed by fire, and produced two radiocarbon dates of 1075 and 1085 A.D. Subsequently, the same structure was rebuilt, but on a different model. A regular pattern of 72 postholes in the floor indicate a raised floor, and a new entry was constructed on the east side of the structure, flanked by two massive blocks of adobe (Fig. 7). At least three other pithouses have been found with these features, and are indicative of a second phase. The structure burned a second time and provided radiocarbon dates of 1305 and 1315 A.D.

A third phase is represented by rectangular surface structures of adobe construction with stone imbedded foundations. We have at least one clear case of superposition, in which such a surface structure overlies a house in a pit of the most recent type (Figs. 8, 9, and 10). However, I suspect that the late type houses-in-a-pit are actually contemporaneous with the surface structures.

Finally, we have the large public structure at the San José site, overlying a rectangular structure of adobe construction. Presumably, some of the surface structures were contemporaneous with the public structure, but at least some must have been earlier.

A fifth phase for which we have evidence may represent a cultural tradition separate from the Rio Sonora culture. In addition, its chronologic placement is still uncertain. Four sites of this phase are characterized by crude stone wall enclosures on the highest hills, frequently in malpais, overlooking the Huepac-Banamichi segment of the floodplain. In at least one instance, cleared areas in the malpais suggest the presence of living areas surrounding the stone enclosure, although excavation produced no evidence of structures. The sites are suggestive of stone enclosures described for the Trincheras culture to the west, and it is probably significant that they are located in a segment of the valley near two passes that cross the mountains to the Rio San Miguel.

Finally, four unusual sites which cannot be placed chronologically or culturally suggest an intravalley pyral signal system comparable to the signal system reported by DiPeso to have been present in the Casas Grandes province. Each of these sites consists of a single, low, circular structure

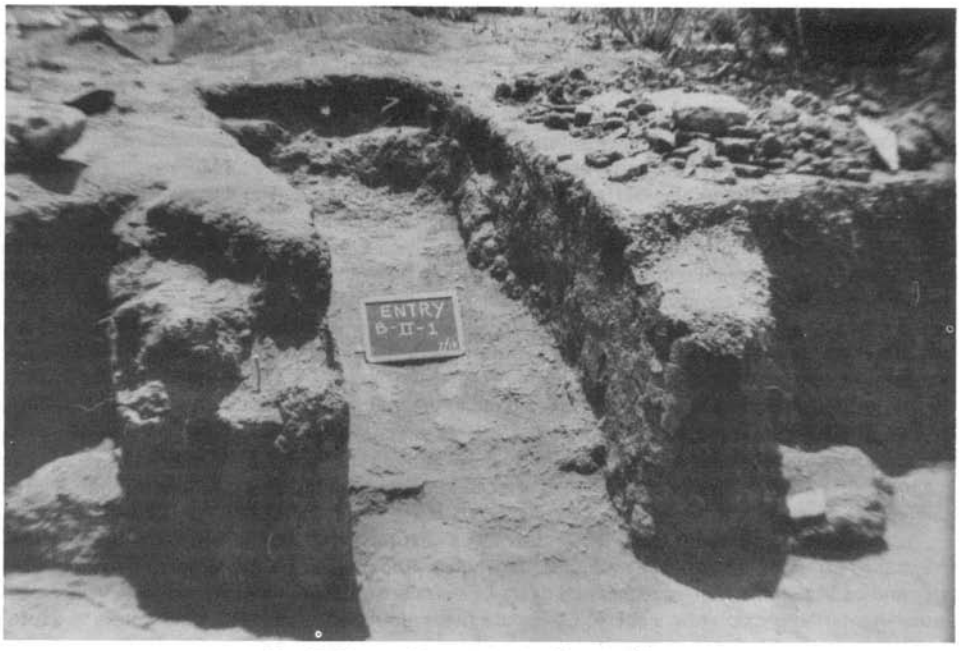

Fig. 5. Entry of house-in-pit, San José site.

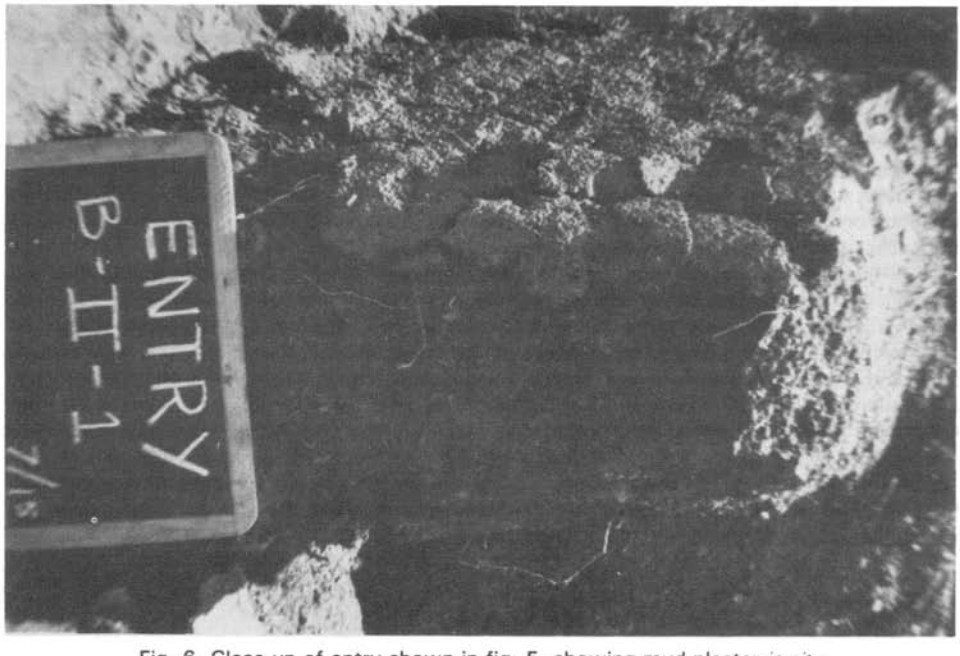

Fig. 6. Close-up of entry shown in fig. 5, showing mud plaster *in situ*.

Fig. 7. House-in-pit entry with massive adobe blocks. The edge of the house pit is in the foreground.

Fig. 8. Wall of surface structure overlying the entry of a house-in-pit. The adobe blocks of the house-in-pit. The adobe blocks of the house-in-pit entry can be seen on each side of the surface structure wall.

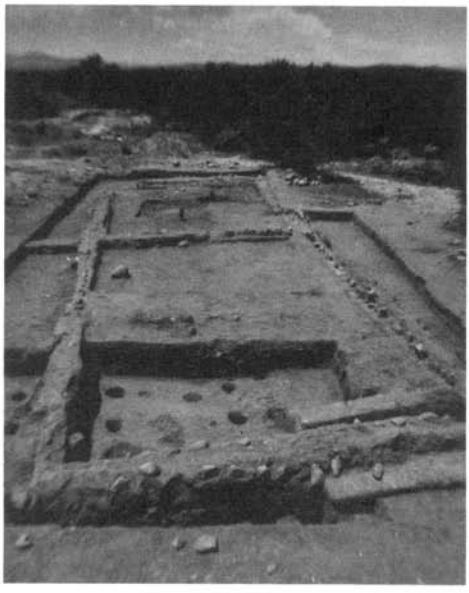

Fig. 9. Surface structure overlying house-in-pit. The adobe block entry right, with the surface structure wall between the adobe blocks. The deep portion of the excavation in the foreground, with numerous postholes, is the house-in-pit floor.

Fig. 10. Plan of surface structure with house-in-pit underlying the south end.

of stone, aproximately 2.0 m. in diameter, situated at the end of a high ridge overlooking the valley. The sites are located several kilometers apart, each in sight of the next one to the north and south. At least one contained small amounts of charcoal, but unfortunately not in recoverable form.

The ceramic analysis has been hampered by the excessive abundance of pottery that has been produced by our excavations, in spite of the fact that we really have not excavated very much of any one site due to a relatively small crew. We have been averaging about 250,000 sherds each summer season. The house in a pit described above alone produced in excess of 100,000 sherds These very high sherd counts were found only at the three large sites, in particular the San José site. Clearly, the occupants of these sites were participating in some special activity which involved an intensive use of pottery, and this is currently being explored in our analysis.

Due to the exceptionally high sherd counts, we have not yet worked out a ceramic typology that can be used in conjunction with the architecture for phase identification. Nevertheless, there are certain ceramic attributes that bear directly on the question of trade relations.

Elsewhere I have argued that Amsden's original idea of a Rio Sonora culture should be extended to include all of eastern Sonora and even into northern Sinaloa on the south, and that in the north it is linked directly with the Chihuahuan culture province and Casas Grandes. The surface structures such as the one shown here were one of the characteristics of Amsden's Rio Sonora culture, and they are found at least as far south as the Sahuaripa valley. Similar, but not identical, houses are also found in southern Sonora.

A second of Amsden's criteria for the Rio Sonora culture was the use of surface texturing, in the form of incising, as the primary means of ceramic decoration. Again, such incised pottery is found throughout the eastern foothills of Sonora and into northern Sinaloa. Furthermore, the incised ceramics as far down as the southern Sonora border are indistinguishable from Convento Incised and Casas Grandes Incised found in northwestern Chilhuahua.

The incised pottery constitutes 99% of the locally made decorated pottery, the other 1% consisting of a crude, red/brown similar to early Mogollon painted pottery. All decorated pottery represents about 4% of the total sherd count.

The incised material can be divided into three categories, which we eventually hope to reduce to more detailed types. The first is plain incised. Rectilinear incised patterns are applied on the exterior of jars and ollas between the rim and shoulder. There is considerable complexity to the patterns, and the execution runs from very fine to crude. Some lines appear to have been incised with a sharp instrument, others with a blunt one, and everything in between. This group is indistinguishable from Convento Incised and Casas Grandes Incised. It is also the only decorated type found in the foothills of southern Sonora (Fig. 11).

The second group is essentially similar to the plain incised, but with the addition of polished red zones included in the decoration. In some instances, the red is a function of polishing and firing, in others a red pigment has been added (Fig. 12).

The third group is characterized by the use of punctates, either with or without incised lines and with or without the red polished zones (Fig. 13).

These latter two groups are typologically the same as Playas Red Incised and Punctate from the Chihuahuan culture province, although there is probably enough difference to identify local varieties.

When we put these textured ceramics together with architecural forms, we have something comparable to DiPeso's early Viejo Period in Chihuahua, not necessarily in terms of time dimensions, but culturally. In effect, from approximately 1000 A.D. on, northeastern Sonora is culturally Viejo Period of the Chihuahuan province, followed by culturally Medio Period but without the elaborate developments characeristic of Casas itself. Rather, it is like a frontier, off-in-the-outback

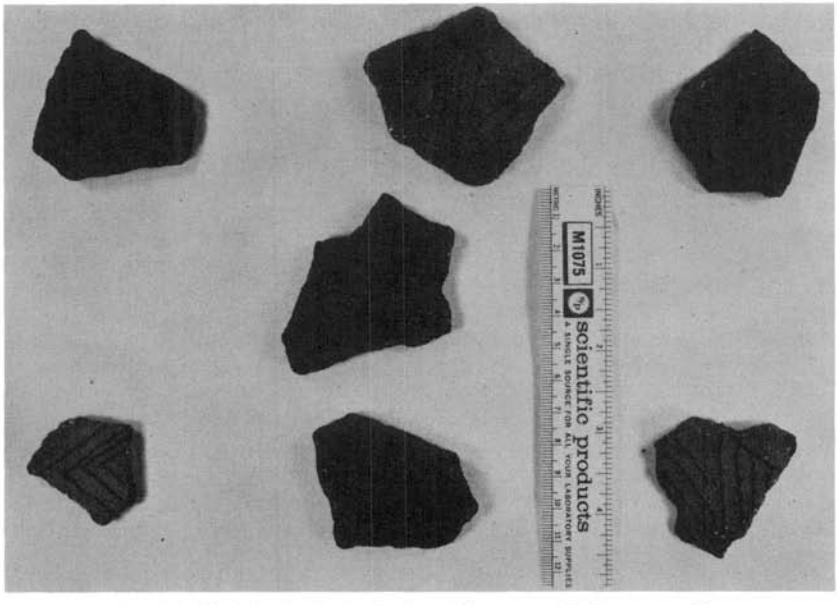

Fig. 11. Plain incised sherds from the upper Rio Sonora valley.

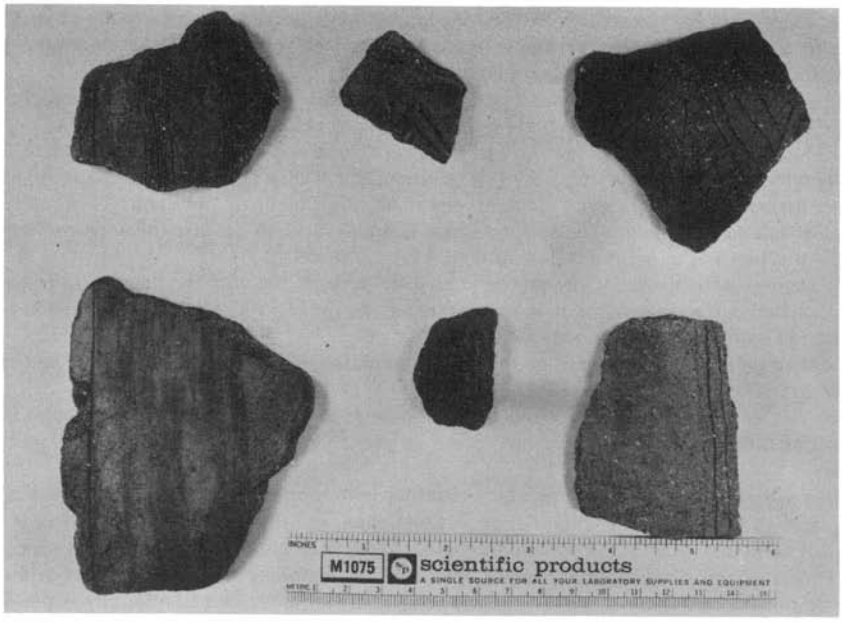

Fig. 12. Red incised sherds from the upper Rio Sonora valley.

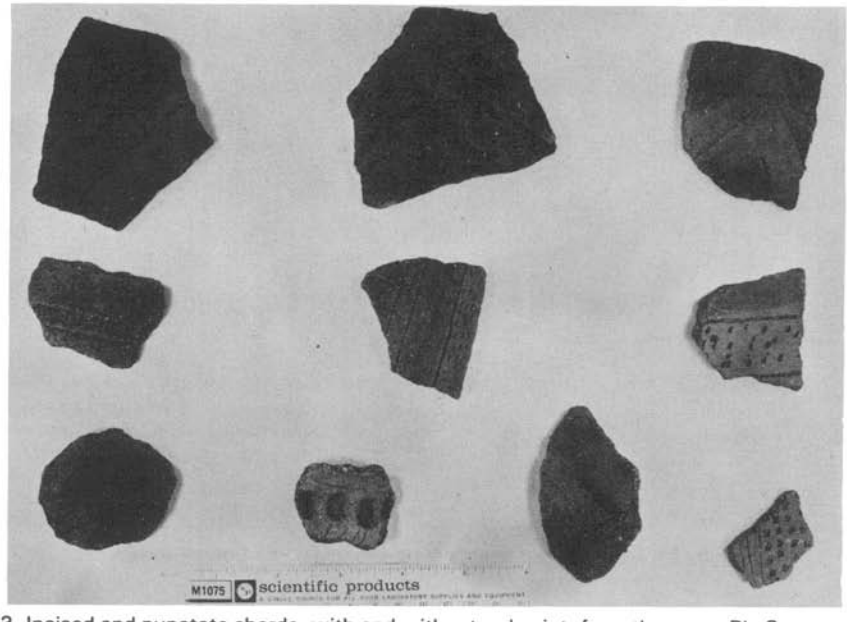

Fig. 13. Incised and punctate sherds, with and without red paint, from the upper Rio Sonora valley.

version of Chihuahuan culture. However, in the Rio Sonora valley at least it seems to begin later than in Chihuahua. this suggests the possibility that it represents a westward expansion, perhaps triggered by the developments that make the Medio period at Casas Grandes.

Another bit of evidence to support the suggestion of a westward expansion is the fact that in Chihuahua a number of texturing techniques are present in addition to those mentioned. A number of textured types are characterized by polishing over the incisions, e.g., Convento Rubbed Incised, etc. Also there is corrugation, corrugation combined with incising, etc. These do not occur in the Rio Moctezuma or further west and south.

As we move further south, the red incised drops out, and only the plain incised is produced. One of the characteristics of an expanding frontier is that the frontier culture becomes increasingly simpler than that from which it started.

Recalling the settlement pattern data again, it is also characteristic of a frontier for a nested hierarchy of hamlets, villages, towns, etc., to be absent. In its place there tends to be a frontier town serving all the surrounding hamlets, or in other words, one dominant site, numerous smaller sites, and no intermediate sites.

If this interpretation is correct, it is probably significant that the area encompasses the north-south trade routes. In effect, peoples related to Casas Grandes controlled the routes north.

Tradeware represents approximately 3% of all decorated pottery in our collections from the Rio Sonora valley. Of these, 91% consists of Chihuahuan polychromes and includes virtually the entire series: both Capulin and Standard varieties of Ramos polychrome, Carretas polychrome, Huerigos polychrome, Dublan polychrome, Babicora polychrome, and Villa Ahumada polychrome.

Significantly, Chihuahuan polychromes were traded into the Trincheras area as well, but incised pottery was not. This is what we could expect if both the Trincheras people and those on the Rio Sonora were getting their Chihuahuan pottery from a distance in trade but were not trading with each other because of hostile relations, or in other words, if this represents a westward expansion.

Of the remaining 9% of trade ware, 3% has been identified as Santa Cruz polychrome from the Tucson basin and 1% represents a variety of other types from the Tucson basin and other parts of the Southwest, including Gila Polychrome and Tularosa Black on white. Finally, the remaining 3% of trade ware represents Guasave Red from Sinaloa and few unidentified sherds which come from further south in west Mexico.

Exotic artifacts which represent trade items include:

Four copper tinklers and one copper crotal. One tinkler was found in a small site neighboring the San José site, the other three are from the San José site.

Fifty-four tourquoise beads found in the fill of a small site across the river from the San José site, but which lacks evidence of architectural features. Five additional beads from a small site north of Banamichi were found in an historic burial, probably dating from the early Spanish period. Two turquoise beads found on survey in the Baviácora-Aconchi segment of the valley have been identified as coming from southwestern sources, one from the Cerillos mine, the other from the Azure mine, both in New Mexico (Weigand, personal communication).

Fragments of shell, including shell bracelet fragments, from most sites.

Five figurine fragments and one effigy vessel fragment may or may not be trade items (Fig. 14). In any case, they certainly represent Mesoamerican concepts.

When we compare the distribution of these trade items, of copper, turquoise, Chihuahuan polychromes, and some shell, with our four models of trade, we find that a pattern is beginning to emerge. The San José site is clearly the dominant site in the Baviácora-Aconchi segment of the valley, and is the location of a large public structure which probably served the surrounding smaller sites.

However, almost all the sites tested have produced at least some Chihuahuan polychromes. None of the turquoise has been found in the San José site, and although four of the five copper items have been found there, the sample is too small to be indicative. This suggests that either the

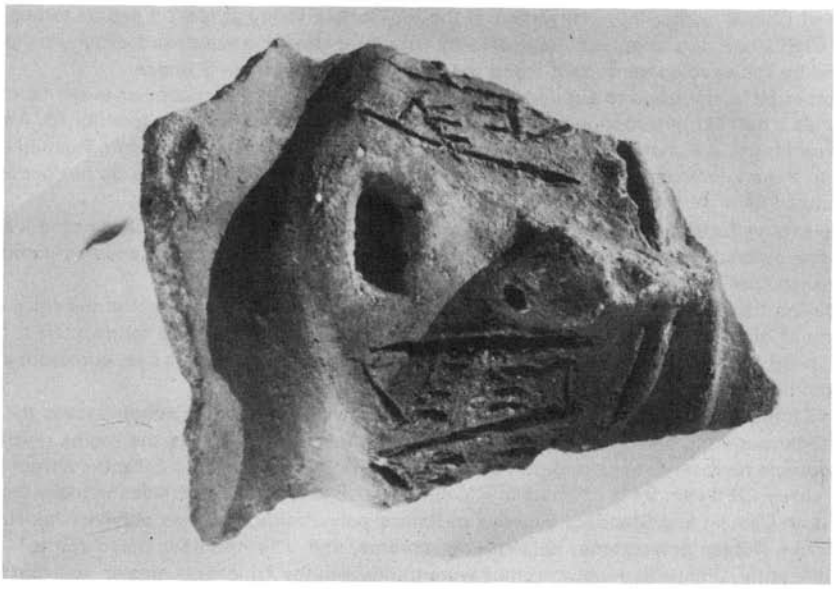

Fig. 14. Fragment of effigy vessel from the San José site.

San José site did not have a monopoly on foreign trade or, more likely, that it served as a redistribution center locally.

One question always raised is what was given in exchange? While we frankly do not know, one suggestion can be made. A total of 22 whole and ten fragmentary stone spindle whorls has been found (Figs. 15 and 16). Of these 59% come from San Jose, and eight are decorated. Although this does not seem like a large number, when taken in terms of the number of structures excavated to date, and in comparison with sites in other parts of the southwest, it is significant. As an example, no modelled spindle whorls, either of stone or ceramic, were found at Casas Grandes. In addition, several modelled ceramic whorls and numerous perforated sherd spindle whorls were recovered, although a complete count is not immediately available. Three stone spindle whorls were found in the floor of pithouse B-II, where there was also found pollen evidence of rumex, a plant material that is reported to have been used as a dye for cotton. Ethnographic data indicate that the Opatá were excellent weavers. Also they had special subterranean houses in which basketry was made. It is entirely possible that weaving was also done in such houses. We are currently exploring the proposition that a local specialty was the production and processing of cotton as a trade item.

Testing the postulated model of a Mesoamerican world system is more general than the above propositions concerning trade systems, and probably cannot actually be done on this project alone. Rather, this project and others like it in the Southwest and northwest Mexico will together contribute to such a test. Basically, this involves determining if the Southwest was in fact a part of a larger system which included Mesoamerica; not simply was it in contact with Mesoamerica, but whether or not the relationship was a systemic one. By the nature of a system, changes or events in one part should affect changes in another. However, Wallerstein's model, and the Pailes and Whitecotton Mesoamerican adaptation of it, describe a system characterized by unequal parts. Hence, events in the Mesoamerican core would be expected to have exaggerated effects on the southwestern periphery, while events in the periphery would have little effect on the core.

Certainly, if trade networks between Mesoamerica and the Southwest can be identified, and if these in turn can be shown to influence local cultures in the Southwest, then a systemic relationship will be demonstrated. In that event, unless someone has the temerity to argue that the Southwest was the equal of Mesoamerica, an unequal system such as Wallerstein's is indicated.

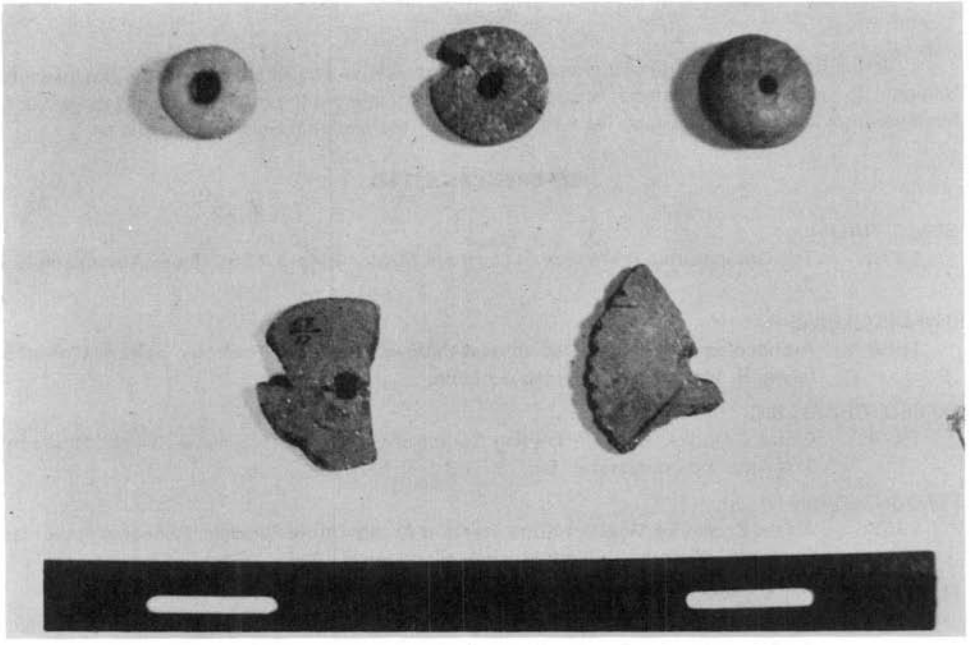

Fig. 15. Stone spindle whorls from the upper Rio Sonora valley.

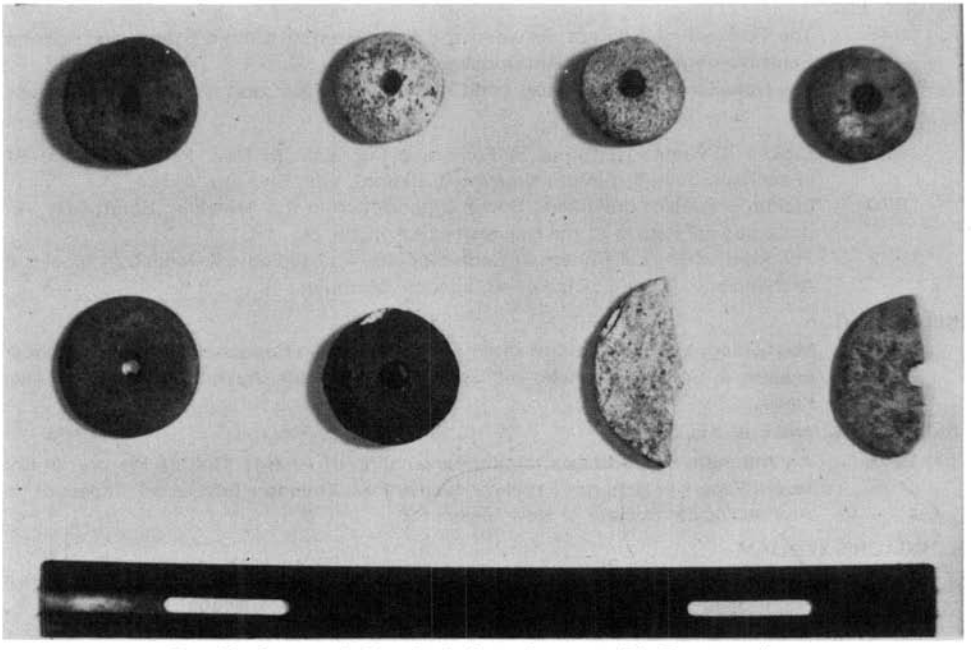

Fig. 16. Stone spindle whorls from the upper Rio Sonora valley.

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