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Commerce and exchange networks through-out northern Mexico: The Mesoamerican-Southwest connection

George Lee Kinney

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COMMERCIAL AND EXCHANGE NETWORKS THROUGHOUT NORTHERN MEXICO

THE MESOAMERICAN-SOUTHWEST CONNECTION

A Thesis
Presented to the
Faculty of
California State University
San Bernardino

In Partial Fulfillment
of the Requirements for a
Master of Arts
in
Special Major

by
Lee George Kinney
March 1987
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Approved by:

Chair

Date

April 24, 1987
ABSTRACT

This thesis examines the information and ideas gathered during four hundred-fifty years since the Spanish conquest about prehistoric commerce and trade in the New World, specifically from the Valley of Mexico in Mesoamerica through the Greater Southwest. Background data are presented about the geography of the region, basic commerce and trade concepts, and a history of research.

Major trade and population centers, such as Teotihuacan, Chalchihuites, Casas Grandes, and Chaco Canyon, are examined from the viewpoint of commercial enterprises and expansion. Mining techniques, manufacturing methods, trade networks, and how these endeavors were controlled by colonization are covered. Included are non-commercial traits and ideas that accompanied traders on their journeys.

Sufficient information, data, and evidence are presented to make a viable case showing extensive Mesoamerican trade and influence in the Southwest.
ACKNOWLEDGEMENTS

To begin, I wish to thank the University Graduate Education Committee, especially Dr. Dalton Harrington, Chairman, for allowing me the opportunity to attempt this project.

The information in this paper could not have been compiled without many years of intense field excavations and research by such notables as Charles Kelley, Carroll Riley, Emil Haury, Charles DiPeso, Donald Brand, and Neil Judd, to name only a few, who dedicated their lives to improve the understanding of the connection between Mesoamerica and the Southwest.

A tremendous gratitude is owed to the faculty members of the Department of Anthropology at California State University, San Bernardino. Their guidance, help, encouragement, and direction have assisted me in the remarkable ascent from the parking lot to "the board" in just over two years.

Specifically, I want to thank my committee members for their support. Dr. James Mulvihill, Department of Geography - Jim, your help in the field of economic geography and your experience in Latin America economics and commerce has made this endeavor truly an
interdisciplinary study. Dr. Russell Barber, Department of Anthropology - Russell, a combination of your Harvard training and your Southwest archaeological experience have made an invaluable and indelible mark on my academic life. You have been the principal guiding light for me through your professionalism and knowledge. Dr. Frances Berdan, Department of Anthropology Chair, and chair of my graduate studies committee - Frannie, from the initial meeting with you to choose a university for anthropology studies to the present, you have never wavered in your support of me as a student. In your subtle, and sometimes not so subtle, ways you have aided and assisted me to always strive for excellence. You are a perfect model for any achiever and it has been my pleasure to have had the opportunity to study under you.

For Joan, my wife, I would need to learn new words to adequately tell you how much your love and understanding have assisted me in this project. Your help with field research was an immeasurable aid to me. Thank you.
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INTRODUCTION

The purpose of this thesis is to provide more information and new insight into the commerce and exchange networks radiating from the Valley of Mexico to the north. Much has been written about commercial enterprises in southern Mexico and Central America. Comparatively, little research has been published concerning the large region encompassing the Valley of Mexico to West Mexico and north to the present Southwest of the United States.

What interest did Mesoamericans have in the vast region to the north? Did they attempt to colonize the Greater Southwest, and if they did, why? The area of Northern Mexico and the Southwest United States supplied a major percentage of the raw materials as well as elite goods for the upper classes of the Mesoamerican cultures. Was the search for raw natural resources the principal reason for the northward expansion? Perhaps the major cultures of pre-Hispanic Mesoamerica, just as cultures today, extended their spheres of influence outward in search of raw materials, new markets, and trade routes.

Whatever the reason, or reasons, this expansion began in Central Mexico approximately three thousand years ago with the Olmec culture and has continued through
the Spanish conquest to today. However, this paper will deal only with the commerce and exchange networks in existence between approximately A.D. 1 and A.D. 1400.
GEOGRAPHY

The region encompassed in this study extends from approximately eighteen degrees north at the Valley of Mexico to approximately thirty six degrees north to Chaco Canyon, New Mexico. The climate is mostly desert with some Mediterranean climate areas. This is broken by the numerous mountain ranges running north and south. The Valley of Mexico has a generally moderate climate due to an elevation of seven thousand five hundred feet above sea level. The valley is surrounded by some of the highest mountains in Mexico, but due to its tropical latitude, snow is rarely seen except at the higher elevations. It is a climate that greatly helped man in his early development in Mexico.

West Mexico has a moderate climate in the winter but much warmer temperatures during the summer. The coastal zone is humid due to prevailing winds from the Pacific Ocean; however, it becomes much drier to the interior of the coastal hills. Moving north along the coast toward Sonora the climate is hot and harsh. Inland, though, from the coast is the region known as the serrana (highland) zone. It is characterized by grasslands, oak and pine trees, and by sierras and river valleys that generally follow a north-south direction. To the east the sierras are much higher and
receive a greater abundance of rainfall. This helps to contribute to the numerous perennial streams in the region. The land to the north of the Tropic of Cancer in the mainland of Mexico is generally harsh land. Today it involves more than half of the land area of the Republic of Mexico but it supports only six persons per square kilometer as opposed to twenty-five persons below the tropic line (Riley, 1978). Because of this, populations in prehistoric times as well as today congregate in locations advantageous to supporting people.

The desert regions of the Southwest are quite harsh in the summer. Daytime temperatures will frequently exceed one hundred degrees Fahrenheit while nights will be relatively cool. The winter season is more pleasant except in the Northwest Mexico corridor in parts of the Chihuahuan and Sonoran deserts where high elevations (often over four thousand feet) mitigate the temperature and snow is not infrequent.

All of the regions allow for the possibility of trade routes because they all offer water sources, though in some areas these are much more scarce than others. The backbone of mountains in Mexico cause an uplifting of moist air and therefore a moderate amount of precipitation in the mountains, consisting of both rain and snow.
Run-off is transported to the sea by small streams crossing the areas of good travel routes. Some streams almost have the characteristics of exotic streams, rising in the highlands and flowing across regions too dry to have stream originations. These climates and terrains supported the rise of the trade and population centers like the Huasteca complex in the Sierra de Tamaulipas, the Chalchihuites Cultures in the valley of the Guadiana in Durango, the Aztatlan Horizon in Sinaloa, and Casas Grandes in Chihuahua. Centers such as these aided the diffusion of Mesoamerican trade items and cultural traits from the Valley of Mexico to Chaco Canyon, New Mexico.
Map 1. The Greater Southwest and Northern Mexico
DEFINITION OF THE FRONTIER REGION

During the years of discussion concerning to what degree, if any, Mesoamerican influence was in effect in the Southwest, scholars have never arrived at an exact consensus of the boundaries. Some scholars extend the Southwest boundary well into Mexico and northward to include Colorado and Utah. Others extend the Mesoamerican boundary north almost to the present-day United States-Mexico borders. Kelly (1980) includes the Southwest region of the United States as a part of Greater Mesoamerica while Riley (1978) refers to that area as the Greater Southwest. Whiting, et al. (1982) say that the northern boundary limits of Mesoamerica should follow generally the ten degree Centigrade isotherm. If this criterion is followed, then possibly climate should be considered to have played a larger factor in the development of this frontier. Add to this the generally accepted description of the northern boundary of Mesoamerica, that being the fluctuating line of dry farming agriculture.

For the purpose of this paper and to avoid confusion to the reader, the northern part of Mexico and the Southwest region of the United States will be referred to as the Greater Southwest. Also, since this paper is dealing only with commerce and exchange from the Valley
of Mexico to the north, West Mexico will be referred to as being a part of northern Mesoamerica.
Map 2. Different Guidelines for Mesoamerica - Greater Southwest Boundaries
HISTORY OF RESEARCH

It is generally agreed now that early man passed through the Southwest on his way to populating Mexico and Central and South America (Poirier, 1981). This movement and settlement pattern, like most new ideas, took a while to be substantiated and accepted. Now we have gone through another sequence of events that has taken time to be accepted. This is the concept that man moved back to the north during prehistoric times from Mesoamerica, beginning shortly after A.D. 1, to greatly influence the culture and lifeways of the natives living in what is now northern Mexico and the Southwest of the United States.

In the 19th century when initial archaeological and ethnographic studies of the Southwest and northern Mexico began, little consideration was given to the idea of contact or relationships between these two regions. As subsequent scholars, who still lacked archaeological evidence of the antiquity of Mesoamerican elements in the Southwest, began to become aware of Mesoamerican traits in the Southwest, they believed these traits were introduced by the Spaniards or the Mexican Indians who accompanied the early conquistadores. For instance, Fewkes in 1893 pointed out that the Hopi Snake Dance closely resembled a similar ceremony recorded in
Mesoamerica. Also, he identified structures at Casas Grandes as pyramids and compounds (1912). However, from about 1915 until well into the 1930's, Southwestern archaeology largely concentrated on the Anasazi who showed a gradual local development in architecture. The general tendency was still to explain any similarities between Mesoamerica and the Southwest as being introduced by the Spaniards. There developed an archaeological cult more or less formally dedicated to the proposition that Southwestern culture was largely an independent development.

But the Anasazi represented the Southwestern culture farthest removed from Mesoamerica and in all probability filtered through the Hohokam (Kelley, 1966). As intensive work and excavation was done in the Hohokam area, first by Gladwin and then by Haury, the question of Mesoamerican influence had to be handled head-on because clear-cut resemblances between the Hohokam and Mesoamerican traits were uncovered. These could not be explained away as convergence or an Spanish introduction because of the antiquity of the Hohokam site. Gladwin (1937) first thought that the similar traits were possibly carried from the Southwest to Mesoamerica. However, with continued research, he abandoned this idea (1957).
One of the most enthusiastic of the early scholars to believe in a Mesoamerican - Southwest connection was Adolph F.A. Bandelier (1890-1892). He believed "in one connected string of evidence from Colorado to Guatemala." Perhaps, though, it was the political boundary between Mexico and the United States that was responsible for the separation of thoughts, for after World War II, archaeology, like most fields of study, was greatly enhanced with international study and views.

A general acceptance in the field was finally reached that agriculture had filtered to the Southwest from Mesoamerica. Pottery was at first thought to have been an independent invention in the Southwest but the weight of a considerable amount of similarities of ceramic style and design gave acknowledgement to exchange between the two regions.

As work continued, others began to realize similarities. Vaillant (1932) saw many of the far-reaching resemblances between Southwestern and Mesoamerican ceramics. At this time other archaeologists were revising their thinking, and work by Sauer and Brand (1932) in northwestern Mexico, Isabel Kelly (1938, 1939, 1945) and Ekholm (1919, 1942) in Sinaloa, and by Mason (1937) and Brand
(1939) in Durango, made information available regarding archaeological cultures in the northwestern area of Mesoamerica. In 1942, Ekholm presented the first paper regarding this situation entitled "Middle America-Southwestern Relationships." Ekholm pointed out that he did not believe the West Coast corridor to be the major channel of movement but suggested the Zacateca-Durango region as the location most likely through which contact was made. This theory has been substantiated by researchers such as Phil C. Weigand (1982) who presented evidence showing that Chalchihuites, Zacatecas, was actively engaged in trade and commerce by A.D. 350.

World War II temporarily halted field work in northern Mesoamerica but research and re-evaluation of known material continued. In 1943 there was a "Mesa Redonda" (round table) meeting in Mexico City concerning possibilities of Southwestern - Mesoamerica connections. Papers were presented by Beals, Brand, Haury, and Kelley, all of whom had conducted research on this question. Shortly thereafter, Haury (1945) reviewed and analyzed all the information thus far gathered. His findings were so complete and encompassing that even today little of his information is changed, only augmented and expanded. Haury stated that "the traits which I believe to be
traceable to Mexico were borne by all methods of cultural transmission, from the diffusion of ideas from group to group to the importation of actual objects, probably by traders." Ekholm had also noted that contact apparently was made across great areas occupied by relatively primitive people and was probably accomplished by small groups of traders or travelers. Research completed during the early and middle 1960's in linguistics and ethnography in northern Mexico substantiate the northward movement of people, probably speaking related languages of the Uto-Aztecan family (Kelley, 1966).

During the 1950's, many new and clear examples of Mesoamerican influence in the Southwest were discovered and examined. Anthropologists such as Kelley, Ferdan, Riley, and Kelly, geographers like Sauer and Brand, and numerous ethnographers worked to increase knowledge to fill the gap between the two regions. Major excavations such as Casas Grandes, by Charles DiPeso, and the re-excavation and evaluation of Snaketown, by Emil Haury, pushed the last doubting thoughts aside.

**TRADE AND ECONOMICS**

Scholars not only differ as to what extent influence from Mesoamerica entered the Southwest but also how
and why. Beals (1974) believes that there were several major periods of Mesoamerican influence on the Southwest. He states that they roughly correspond to the periods of La Venta (900 B.C. - 400 B.C.), Teotihuacan (A.D. 1 - A.D. 650), Tula (A.D. 900 - A.D. 1200), and Aztec (A.D. 1200 - A.D. 1521). To this list I would add the Tarascans, contemporaries of the Aztecs, and their significant influence on West Mexico and farther north.

Conquest was thought by some to have been the reason for the intrusion of Mesoamerican peoples into the Southwest, but I believe the majority of researchers now consider commerce and trade to be the principal motivations.

Several terms of trade need to be identified at this time. First is a trade network. A trade network is any particular acquisition system, whether based on treaties, gifts, routes, or any such factors. This is often very fragile and short-lived due to instabilities in political structures. The second in a trade structure. A trade structure is usually more generalized and outlasts any particular economic arrangement. It represents the perdurable factors of all trade economies through time in a defined zone (Weigand, 1982). This helps explain why trade economies in precious materials
continue to operate despite the collapse of political structures.

Since almost all economies are layered or stratified, a society must participate in economic decisions, including trade and exchange, at local, regional, and long distance trade levels. This systematic acquisition of important rare resources was of utmost concern to all Mesoamericans as well as those inhabitants of the Southwest. It was natural for an entity to try to control the procurement, manufacture, and distribution of precious materials, especially something as important as obsidian and as treasured as turquoise. With the existence of stratified societies, trade and control of all luxury items followed closely behind.

In exchange systems there are generally two divisions, separating high-value and low-value trade items. One sphere deals with high-value wealth objects and the other with mostly low-value utilitarian objects. Usually the high-value objects will travel whatever distance is necessary to fulfill the desires of the elite classes demanding those objects. The low-value objects, though, are usually limited in the distance they will be transported. (See graph 1). Some exceptions do exist, as in most cases. The lowland Maya imported the majority of utilitarian
goods from the highlands to meet daily needs (Rathje, 1972), but in the region covered by this paper, the guidelines are fairly well followed. Possibly this was true due to similarities in environment, or possibly to the non-existence of long-standing major civilizations, with their ultra-elite class, directly after the fall of Teotihuacan.

There was also probably a conversion from low-value to high-value goods. As low value goods were brought into the major centers through a local trade network, those products accumulated for the purpose of long-range trade to other regions. Very possibly a local product, for example peyote, was exchanged into a nearby center such as Casas Grandes (an example of low-value trade). After accumulating considerable quantities, then that same product was traded to another center far to the south in Mesoamerica (an example of high-value trade). This would allow conversion of a common or utilitarian product, massed for transport to another region, to a high-value product which would bring another high-value product in exchange (Gumerman, 1978).

Trade or exchange also must have reciprocity of some sort. Sahlins (1965) drew distinctions of generalized reciprocity (pure gifts), balanced reciprocity (a relative
Graph 1. Trade items over distance.

(From Colin Renfrew)
one-to-one exchange, and negative reciprocity (bartering), Gifts are given to impress or to establish, improve, or confirm relationships, but almost always with a hidden agenda. In a one-to-one exchange situation, persons of equal social status trade items which both parties find of equal value. In bartering, a balance of value is not always a factor. One party may barter for goods of much higher value than what is given in return.

Different types of products exchanged between different groups would fall into different categories. The exchange relationship between Mesoamerica and the Southwest communities would probably have been a high-value exchange sphere with negative reciprocity. Turquoise or cotton goods might have moved to the south in exchange for copper bells, macaws, or ceremonial information. Within communities and between similar communities there would have been an exchange of low-value goods with balanced reciprocity. With local communities generally having equality, they would have exchanged foodstuffs, lithics, ceramics, and other low-value goods. There was usually no exchange of exotic or luxury items at the village level of trade because the villagers were basically egalitarian.
THE PEOPLE OF THE GREATER SOUTHWEST

Who were the people that inhabited northern Mexico and the Southwest region of the United States prior to the arrival of the Mesoamericans? They are given the broad general name of Chichimecas. The Chichimecas are referred to as the people of a Uto-Aztecan tongue, but also as in any of the less civilized tribes occupying the region generally to the north of the Tropic of Cancer in Mexico. They were considered uncivilized by more advanced cultures of Mesoamerica. The early traders from Mesoamerica may have looked to this region as a vast untapped market and trade area. Possibly the major mining, manufacturing, and trade centers of the Greater Southwest created a "backwash effect" on outlying regions (de Souza, 1979; James Mulvihill, personal communications, 1985). These prosperous centers may have caused a negative development effect on less prosperous regions through the migration of enterprising or skilled people to these centers. An analogy of this relationship in commerce and exchange might be the same as a developing nation and how it looks to underdeveloped nations for a source of raw materials as well as a market for goods.

Good relations were probably sought with the Chichimecas by the Mesoamericans for several reasons.
First was the desire for a raw material source and a lucrative trade market. Second was the long distance involved. If warfare was conducted in the north, a tremendous logistic problem would have had to have been overcome. Third was the fact that the Chichimecas used the bow and arrows. The Mesoamericans to the south used atlatl (spear thrower) as a weapon and
I believe they would not have wanted to engage the bow and arrows in battle.

THE TRADERS

Sahagún (1959) tells us that among the Aztecs,

"The vanguard merchant is a merchant, a traveler, a transporter of wares, a wayfarer, a man who travels with his wares.

The good vanguard merchant is observing, discerning. He knows the road, recognized the road; he seeks out the various places for resting, he searches for the places for sleeping, the places for eating, the places for breaking one's fast. He looks to, prepares, finds his travel rations.

The bad vanguard merchant is uncouth, crude, rude, dull. He goes to no purpose when he goes; he travels the road to no purpose. Obstinate, impetuous, blind, ignorant of the road, he is unobserving, careless. He encounters the gorges, the cliffs; he leads people into the forest, the grasslands; he plunges them into thickets."

Sahagún described several classes of merchants and how they also operated as spies and informants for the military. Their trade networks were also a system for
the reconnaissance of distant lands for raw materials and functioned to arrange possible alliances with foreign peoples. Their dress and appearance were distinctive. They wore gold nose and ear ornaments, often were adorned with colorful feathers, and are always pictured with a tumpline burden and a walking staff. When camped, the canes were bundled together to represent the image of the god Yacatecuhtli. Everywhere that pictures of the trader or merchant have been found, from the Valley of Mexico to the Southwest, he always has this general appearance.

The Aztecs called this trader-merchant a pochteca. Often they would leave on long journeys together, mostly to avoid problems on the long hazardous trails. Some fifty years after the Spanish conquest, Sahagún wrote down native informants' details of a prehispanic commercial trip (1959). They began the journey at Tenochtitlan with possibly fine obsidian, rich cloaks, or another luxury product, bound for another trading center. Upon reaching their destination, they might trade for items such as stone knives, bells, needles, cochineal, or piedras de lumbre (stones of fire). Also a trade for slaves might be included. The slaves could serve as porters during the return trip to Tenochtitlan and then could be used in ceremonial sacrifice or used as a
Figure 1. Burden carriers: (a) Gila Butte Red-on buff, from Snaketown, Arizona (b) Codel Mendocino and (c,e) Codex Fejervary-Mayer (after Pina Chan, 1959) and (d) from a Sacaton Red-on-buff plate in the possession of L.G. Lewis, Tuscon. (From Emil Haury)
possible export item to another region.

Although pochteca conducted normal market trade, (Frances Berdan, personal comments) they also frequently engaged in long distance trade, dealing almost exclusively in goods for the elite. Not much information is available concerning the use of money, but since the pochteca were mostly dealing in distant markets, trade items probably would have been a better exchange medium in which to work (Polanyi, Arensberg, and Pearson, 1957).

Curiously, more is known about the pochteca-type traders in life than in death. Several Spanish chroniclers such as Sahagún have written about their lives but little is known about burial procedures. Numerous burial sites have been excavated and examined in northern Mesoamerica (Ekhol, 1942) and in the Southwest (Reyman, 1978). Ekholm excavated a high-status burial site in Sinaloa and found a body in a fully extended position as was common in Mesoamerica. It was accompanied by a large array of trade items including eighteen pottery vessels, two large obsidian knives, two large shell plaques, two thousand large shell beads, eighty-seven copper bells, two pats of red ocher, nineteen shell bracelets, a bone dagger, and two trophy skulls. The body was wrapped in cotton cloth. Whatever was the high social position of the man,
the culture certainly had access to an extensive trade system. Reyman has also excavated several burial sites in the Anasazi region that have had similar accompanying items. They were initially believed to be graves of the local elite but now, with more knowledge and understanding of extensive trade networks, the sites appear to have been burials of pochteca-type personnel.

Pochteca is the Aztec (Nahuatl) word for the long distance merchants. But what about the centuries of traders prior to the Aztec Empire (A.D. 1430 – A.D. 1521) (Borhegyi, 1971)? Should they also be called the same? Several researchers believe a more all-encompassing name would be more fitting. Trocadores (from the Spanish verb trocar, to exchange or to barter) has become a frequent name given these merchants and is the descriptive term that I will use in this paper when referring to non-Aztec traders.

THE MAJOR CENTERS: THEIR COMMERCE AND TRADE

How did the centers develop their commerce and trade enterprises? All of them began with strong central control. It is not possible to have an extensive commercial endeavor, with mining, manufacturing, and far-reaching networks, without a central controlling body. This
controlling body must have the capital to initiate and operate the commercial enterprise, provide protection of natural resources and trade routes, and be powerful enough to ensure success of long-term projects or trade agreements. Some centers developed at the location of the ruling body while others arose in remote regions of natural resources or in strategic trade route locations, but all owed their development to the ruling power. Beginning with the Valley of Mexico and moving generally to the north, I will present information about commerce and trade items of several centers and how they helped the diffusion of Mesoamerican traits into the Southwest.

Teotihuacan

By A.D. 1 Teotihuacan was a center of commerce and manufacturing. There were at least nine obsidian workshops in the city (Spence, 1967) and the city was supplying raw materials to areas that did not have access to the resource regions. During the Tzacualli Phase (A.D. 1 - A.D. 150) the number of workshops in the city increased from nine to forty-eight and the supply of raw materials to other areas stopped, evidently in an attempt to eliminate manufacturing competition (Millon, 1967). The state government had developed and regulated the procurement
and transportation systems to supply a steady flow of large quantities of raw obsidian to Teotihuacan.

As Teotihuacan became more complex with increased commerce, a larger population, and the beginnings of a religious center, the ruling power extended its acquisition network all along its frontier in order to have access to more diverse raw materials for manufacture and trade. They apparently also established colonies at numerous of these locations to maintain control over production. They intensively exploited three zones for mineral wealth: the Cerro de las Navajas area was quarried extensively for high-quality translucent obsidian, the Sierra de Queretaro was quarried and mined for the extensive cinnabar-bearing sands, and the Chalchihuites region was a spectacular producer of turquoise-type minerals.

Obsidian was obviously the mainstay of Teotihuacan. The two major quarry areas were Otompan, located sixteen kilometers to the east, and Cerro de las Navajas, fifty kilometers northeast. The raw materials were transported in bulk to Teotihuacan for manufacturing into tools and blades. A tri-workshop format was used (Spence, 1981). Production from local workshops was intended primarily for local consumption, with distribution being through direct contact with consumers or through local marketplaces.
The precinct workshops, so named because of their locations in conjunction with major public structures, probably were involved in a special production regulated by the state with the finished products being used for ceremonial purposes. The third type, the regional workshops, were involved in production of obsidian for wider markets. They manufactured only cores, blades, or bifaces and many blanks. Because the blanks were finished at the location of the user, they were ideal for transport, suffering minimum breakage over long distances. The obsidian by this time was being traded as far south as Guatemala, to the east to Yucatan, and to the west to Jalisco. The dominance and control exhibited by Teotihuacan over the mining and trade of this raw material is shown in the economic predominance and great physical growth of the city during the Early Classic Period (A.D. 300 – A.D. 600). Teotihuacan controlled the extraction, moved the raw materials to the city for manufacture of products, and then controlled the marketing and exchange of the finished products.

Cinnabar was one of the rare raw material resources exploited in quantity by the ruling class of Teotihuacan during the Early Classic Period. The principal mines, located in the Sierra de Queretaro to the north, were
complex chambered mines with adits (air vents to facilitate fresh air movement in the mines) and tunnels that extended hundreds of meters. The extraction was so complex and extensive that highly centralized control, including colonization, must have been in effect (Weigand, Harbottle, and Sayre, 1977). The cinnabar was processed in Teotihuacan as red paint to be used as ceramic paint.
and to color pyramids and residences of the elite as well as being an elite trade item.

Turquoise, though, and this term includes many of the extensive line of green stones considered to be precious, but excluding the jadites, appears to have been the major Teotihuacan luxury rare resource. In order to gain complete control of this commodity, they initiated colonization of the regions of mining to the north. The Chalchihuites region of Zacatecas was the most spectacular of these endeavors, and the most well-developed mining venture sponsored by Teotihuacan. By A.D. 350, large mining operations were active at Chalchihuites (Weigand, 1968), and controlled from the Central Valley. Although the mines also produced cinnabar, rhyolite, chert, and red and yellow ocher, the main item was the blue-green mineral stones.

Other states besides Teotihuacan were highly involved in mining extraction from resource regions. Xochicalco, Tula, Culhuacan, and Cholula, among others, had an impact on these regions and each left stylistic influences on the mining region during the time of their respective exploitation and extraction of natural resources (Weigand, 1968). Possibly Teotihuacan became militaristic (Millon, 1979; Cowgill, 1979) in response
to the loss of the rare resource monopoly it had held.
Resource management was one of the major functions
of the state and if it was no longer able to provide
protection of the acquisition of the raw materials and
keep a workable organization of the manufacture and
distribution of products, it began to decline.

With the collapse of Teotihuacan about A.D. 650,
there had to have been a serious effect on the turquoise
trade system. However, by this time the precious stone
had become culturally implanted and the desire for
it continued. Cultures and civilizations rise and
decline and their trade networks also fall, but the
trade structures dealing in prestige items find a way
to continue through the time of transition.

During the Zocango Phase (A.D. 1150 - A.D. 1350),
Teotihuacan was again of some size and importance in
the region of the Valley of Mexico, though never close
to its past pinnacle. At this time it was incorporated
into the Acolhua domain under the central control of
Texcoco. Actually during the time of the Aztec Triple
Alliance (A.D. 1430 - A.D. 1521), Teotihuacan was the
political center of a small state subject to Texcoco.
The great pyramid made Teotihuacan of considerable
religious importance to the later Aztecs and a market
was held there regularly.

Maps constructed by Sanders and Price (1968) and Millon (1973) indicate that Teotihuacan was not as all-encompassing as before, but broken into zones identifying Aztec II and III ceramics. The San Mateo zone included approximately one hundred forty-seven hectares based on a minimum of twelve and one-half sherds per hectare. The largest zone appears to have been a radial village of the sort common in the Teotihuacan valley during those periods. Each locality included one or more Aztec domestic structures and associated middens, storage facilities, open air activity areas, and gardens as well as religious structures (Spence, 1985).

The obsidian found at Teotihuacan during this phase generally is either green or grey. Source analysis shows that it came from the same regions as in Early Classic times, Cerro de las Navajas in Hidalgo and Otompan (Spence and Parsons, 1972). The green (Cerro de las Navajas) obsidian when polished or flaked is characterized by a golden sheen, the result of numerous tiny bubbles left during rapid cooling (Cressey, 1974). The particular variant of green obsidian is found in a significantly greater proportion during the Aztec Phase than during earlier times. It is not known yet
if this is merely exploitation of an easy deposit or if the Aztecs selected for this type because of the golden sheen. However, today, of the obsidian pieces made to be sold to visitors of Teotihuacan, the golden sheen figures are certainly more highly prized. The grey obsidian either was mined in the Otompan region or was acquired in stream-rounded nodule forms found on the surface.

Workshops using the materials from these two source regions favored different types of production for different purposes. The grey obsidian from Otompan was generally used for bifacial tools and end scrapers (Clark, 1979). The green obsidian from Cerro de las Navajas was normally used for core-blade production since it was better suited for this product (Spence and Parsons, 1972). The Navajas cores were blanks, not fully refined artifacts. Apparently the intent was to reduce the weight of the object making for easier transport and to insure there were no major flaws in the obsidian. Not only would there be less weight to transport but stability would be greatly increased. This would greatly reduce the breakage experienced if transporting finely finished blades, just as was done in Early Classic times.

Judging from the number of blade fragments and
exhausted cores, Spence (1985) indicates that the Aztec period obsidian working was oriented toward core-blade production. Also, the condition of the cores and the low quantity of waste indicates that cores arrived at the site as blanks rather than an unaltered raw material as it had in earlier periods. If the raw material is modified to blanks near the source site, this also lightens the transportation load and eliminates poor quality material before it is transported.

None of the Aztec workshops at Teotihuacan were associated with public or ceremonial architectural as earlier. This probably indicates consumption by the local population or trade and transport to other areas. Also since obsidiandebitage is much less frequent than from the Tlacualli Phase or Middle Horizon which were full-time workshops, Aztec workshops possibly were part-time production factories (Spence, 1985).

The Navajas obsidian was procured by groups of residents living at or near the source site. Some was used to pay tribute to Texoco and Tenochtitlan and eventually entered the regional market systems while some entered the system through local markets, itinerant traders, and interpersonal exchange (Berdan, 1978). The Aztec-period craftsmen of Teotihuacan
Figure 2. Shape of obsidian blanks at Teotihuacan during the Zocango Phase. Size was approximately 39-57 MM per side.

could have obtained Navajas obsidian through the Teotihuacan market, trips to the main Valley of Mexico marketplaces, or by trips to the towns close to the source, some only forty-five kilometers from Teotihuacan. This certainly was a change from the posited complete government controls of earlier times.

Of interest is the social units involved in
procurement and craftwork. They were single households and small groups, not the calpulli (residential districts) normally associated with the Aztecs. Spence (1985) says these workshops were oriented primarily toward local consumers, rather than more distant markets.

However, the Cerro de las Navajas obsidian has been identified at wide reaches such as Cempoala, Veracruz; Apatzingan, Michoacan; Laguana Zope, in the Isthmus of Tehuantepec; and as far south as Chalchuapa, in El Salvador and north to Culican, Sinaloa. The high-quality Navajas obsidian if found even in relatively small rural communities due to the highly flexible and varied trade and market networks of the Aztecs. As opposed to the high level governmental control of obsidian production prior to A.D. 650 in Teotihuacan, the system under the Aztecs was relatively free of state control (Spence, 1985), as evidenced by little association of workshop production for the elite.

Based on calculations by Clark (1981), no more than six per cent of the Valley of Mexico obsidian needs were met by tribute from Teotihuacan area; thus the core-blade needs of the population of the basin must have come from outside the tribute network, presumably through trade networks.
1. Cempoala, Veracruz
2. Apatzingan, Michoacan
3. Laguana Zope, Isthmus of Tehuantepec
4. Chalchuapa, El Salvador
5. Culiacan, Sinaloa

Map 5. Locations of Cerro de las Navajas obsidian traded from Teotihuacan
With these comparisons of commercial enterprises and trade within the same location but from different time periods, it is possible to see the changes in production styles and degrees of governmental controls.

**Chalchihuites Cultural Region**

This area derived its name from the green stone, chalchihuite (chalchihuitl in Nahautl means precious), of much importance to the Mesoamerican cultures. It is not turquoise and does not have the high-grade quality of turquoise. Chalcanthite, a blue vitriol, and chrysocolla, the blue-green mineral in copper sulfide deposits, are two mineral stones that fit into this category. They were the most highly prized stones until the Mesoamericans became aware of the mineral turquoise farther to the north. Active in mining from approximately A.D. 350 until A.D. 1350, this region had three centers, Chalchihuites, Navacoyan, and La Quemada, with all three being important in Mesoamerican expansion into the region.

It is commonly accepted that the economy of Zacatecas since the sixteenth-century has been mostly dependent on mining. However, this importance extends back prior to the Spanish colonization by more than one thousand
Map 6. Relationship of Chalchihuites Cultures to Teotihuacan
years. Possibly by A.D. 350, this region was producing raw materials from mines for trade. Chalchihuites, when it began producing raw materials, naturally fit into the trade structure. This trade structure was initially begun as the trade network of the Olmec culture about 1000 B.C. - 800 B.C. during the Formative Period (Coe and Cobean, 1970; Weigand, 1982). They began their trade networks to the north in search of obsidian for lithics and cinnabar for paint. After the demise of the Olmec culture, the knowledge of and the desire for the natural minerals from the Zacatecas region continued.

The mining in Zacatecas and the subsequent trade farther to the north were primarily oriented toward luxury goods (Weigand, 1982). As is the case of most mining societies, extraction and exploitation is seldom initiated internally. They are formed in response to political and economic pressures from a metropolis or a colonization from another region. Some mining is of practical importance in development of the culture, such as obsidian, while some, such as that of the blue-green stones, are for status-level markers. The latter was the task for the Chalchihuites cultures.

The Chalchihuites cultures carried on mining operations on massive scales. The supply of chalchihuite
products exported to the south to Mesoamerica came from a conservative estimate of seven hundred fifty mines, ranging in size from having a spoil of tens of thousands of tons to hundreds of thousands of tons (Weigand, 1982). Mines were both of the surface strip-mining type and excavations into hillsides, many with multiple entrances. Many of the larger mine shafts had air/light openings in the roof, which also offered an escape from the frequent cave-ins. The high degree of the importance of the chalchihuite stone can be evidenced by the mining conditions. There were constant threats of collapse, high heat levels, dusty and smokey air with little circulation; and yet the mines were in operation for hundreds of years (Weigand, 1982).

In addition to their mining responsibilities, people of the Chalchihuites cultures were also required to have expeditions to the north for the purpose of finding new mining areas and to carry on trade (Weigand, 1968). With this continual attempt at expansion to the north by the Mesoamerican cultures, another resource was uncovered. Chemical turquoise, as opposed to chalchihuite, began to appear at Chalchihuites prior to A.D. 900 (Kelley, 1966; Weigand, 1982). This was arriving from two sources in considerable quantities,
with the bulk of the material coming from Cerrillos, New Mexico. The Southwest was still in the Basketmaker Period and no complex societies were trading to the south. Apparently, Mesoamerican expansion was operating out of Chalchihuites for the purpose of exploiting this new raw material. This connection is evidenced by Chalchihuites motifs occurring among the Hohokam by A.D. 500 (Kelley, 1966; Haury, 1978). We know that the acquisition and trade of chemical turquoise from the Southwest was going on, but what we do not yet understand is the structural relationship between the local mining at Chalchihuites and the acquisition of turquoise from the far north (Weigand, 1982).

There is a similarity in style of mining techniques and tools used in northern Mexico for the mining of chalchihuite and those used in the Southwest for the extraction of turquoise, such as the heavy-headed hammers with a groove for a handle or a leather thong to grasp while breaking rock. Some worn handles with evidence of twine for attachment have been found in sorting piles (Blake, 1889; Weigand, 1982).

How long would be a reasonable time for a trocador to make a trip of such distance? Huichol Indians today regularly walk approximately forty-five kilometers
per day for short periods, but for longer periods of time, a thirty-five kilometer per day rate is more reasonable (Weigand, 1982). I believe this is a viable rate of travel even with a moderate load. At this rate, a round trip to the north to acquire turquoise from the Southwest and return would realistically be an annual trip. A great deal of turquoise could not be carried per trip due to the necessity of also carrying food, water, clothing, and weapons for hunting and defense. Also, like diamonds today, a small amount each trip would greatly help to keep the value at a premium. According to Weigand (1982), unlike initial processing of obsidian at the raw material site, the turquoise from as far as New Mexico was transported with the matrix, thus increasing the weight.

By the Early Post Classic Period, less unfinished material was being moved to the south and more refined material had taken its place. This was very possibly related to the rise of Chaco Canyon as a great production center of turquoise artifacts by A.D. 1000. By then systematic turquoise acquisition and production into luxury items had become characteristic of the societies of Arizona and New Mexico. The role of chalchihuite had waned. This meant a considerable sociocultural
change had occurred and the formal presence of the trade structure now extended into what is today the Southwest United States.

Strong central Mexican influence was evident in the Zacatecas region in two waves, the first around A.D. 350 and again about A.D. 800 (Kelley, 1971), as evidenced by abrupt pottery changes. This adds more credence to the belief that Teotihuacan colonized the region and attempted to establish trade networks. In A.D. 800 there was a rebuilding attempt at Chalchihuites to suit the changed social situation. By A.D. 900 the Chalchihuites mining culture went into a drastic decline. This date coincides with the rise of La Quemada and its importance as a local center. With the continuing rise of importance of turquoise from the north, this region was bypassed and abandoned as a mining center as trade and caravans moved farther to the north (Kelley, 1971; DiPeso, et al., 1974). The Tarascans possibly carried on some silver mining in the region, but only to a minor degree (Weigand, 1985).

The ancient mining and trading societies of Zacatecas were dependent on the distant Mesoamerican cultures exploiting their region and were integrated into the ancient trade system by the long distance trade economy.
This dependent status does not detract from their importance, however, for when an outside power declined and there was a void before another arose, the Zacatecas region continued to operate as a trade center because they were an integral part of the trade structure as they produced luxury items.

La Quemada, also in Zacateca, is an excellent example of Mesoamerica reaching northward with trade centers. Later than Chalchihuites, La Quemada developed with the rise of the Toltec culture (A.D. 900 - A.D. 1200). The Toltecs, like the other Mesoamerican cultures interested in new raw material resource sites, also extended their trade routes to the north.

The trade center of La Quemada contains evidence of extensive Mesoamerican influence. It was a massive fortified citadel (Armillas, 1964), with pyramids and monumental architecture, columned halls, ceremonial structures with central plazas, the Mesoamerican style I-shaped ball court, and a generally elaborate complex establishment. The extensive array of pottery types of different regions shows the antiquity and diversity of trade and exchange through the area over an extended period of time (C. Kelley, 1963). Even the tzompantli (skull rack), popular with the Toltecs and Aztecs, was
found there. The skull and long bone racks differed only slightly from those used in the south in the means of suspension on the rack (E. Kelley, 1978). During the excavation of La Quemada the floor of the Hall of Columns as found to be covered with a layer of burned human bones ten to twenty centimeters thick. There were no skulls found in this mass, however, for they were presumably used as trophies on a tzompantli (E. Kelley, 1978).

Besides the massive masonry architecture, there is the extensive road system found at La Quemada. C. de Berghes, a German mining engineer, was commissioned in 1831 to make a map of the La Quemada area for possible future mining ventures. At that time, the thirteen artificial roadways that radiated from the trade center were still easily recognizable. Also included on the map were secondary towns with roads connecting them. Some of these were built by having parallel masonry walls filled between with rubble to form broad, paved roads.

The location of La Quemada, both from a regional and super-regional viewpoint, is excellent for a civic-ceremonial primate center with a functional hierarchy. Briefly, a functional hierarchy is the concept that
Map 7. The ancient road network of the major trade center of La Quemada is evident in this map.

(Map from C. de Berghes, 1833)
settlements, along with their respective sustaining areas (hinterlands), can be grouped into distinct levels with respect to the number and type of functions, or constellations of repetitive activities, they contain (Christaller, 1933). Also assumed within this is the idea that people in smaller settlements are usually dependent on larger settlements for more specialized goods and services. The higher order a settlement is, the more state-type government decisions, religious oriented architecture, larger markets, and goods for trade it facilitates. La Quemads's prehistoric road network would have been very advantageous to the exchange systems of other settlements.

The relationship of size of settlements shows the distribution and configuration to be primate with La Quemada and the secondary center, Pilarillos, being much larger and more complex than any other site in the region at that time. Some (E. Johnson, 1970; G. Johnson, 1980; Smith, 1976) suggest that these systems are created by a highly centralized ownership of production resources and an external trade orientation with a corresponding low level of production diversity in the hinterland settlements. This is generally characteristic of underdeveloped systems and perhaps La Quemada perpetuated its primate status by
force, or the abrupt end of the trade center prevented a maturing.

In the hinterland around La Quemada, most of the settlements engaged in their own basic production for local needs, indicated by comparison of lithic tools and debitage (Trombold, 1985). Most settlements made tools from the raw material whose source was closest and required the least transportation. This certainly indicates a sharp division between low-value and high-value trade items in the region.

For a time La Quemada was the focus of all economic and political activity for great distances. Through this locale passed much material going to the north and south. It was located on the shortest and best of the trade routes between Mesoamerica and the Southwest. The region was relatively easy to traverse on foot because of the north-south orientation of the valleys and mountains. The valleys were abundant with water and a food supply was available to both the north and south of La Quemada. Many of the hundreds of thousands of pieces of turquoise like that uncovered at Chaco Canyon probably passed through the center (Weigand, 1982).

However, its location near the relentlessly encroaching arid zone probably contributed to its fall as it did
indirectly to the chaotic conditions associated with the fall of Tula, Hidalgo in approximately A.D. 1200 (Davies, 1977). With the loss of an environment conducive to supporting a life by agriculture, the center was also unable to continue as a civic-ceremonial center or as an economic trade center with a functional hierarchy, and its demise coincided with the fall of Tula.

The third of the major sites within the Chalchihuites culture region was Navacoyan. The Navacoyan site is located approximately eight kilometers east of the present-day city of Durango, in the state of Durango. It was occupied and used as a burial ground by the Chalchihuites cultures from about A.D. 550 until A.D. 1350. As to be expected, there are many similarities with Mesoamerica but there also exist many similarities of items such as copper bells, projectile points, and ceramic styles and motifs between this site and the Hohokam in present-day Arizona. The number of these items indicates that a strong relationship or trade existed between these two areas. There are many figurines of stone, shell, bone, and pottery of Hohokam origin. Beads and pendants from the north are also included as possible trade items. Beyond resemblances to the Southwest United States, there are also similarities to
West Mexico (Sinaloa) and items of Tarascan origin (Howard, 1971).

Spindle whorls, because of their variety of distinctive designs, are often a good indicator of trade within a region and this applies here. There is no evidence of irrigation or of any cotton agriculture; however, there is an extensive collection of malacates (spindle whorls) excavated from the site. Some appear to be of local manufacture while others have the characteristics of west coast influence. This suggests a substantial trade in raw cotton with the weaving being done at Navacoyan.

Numerous pipes have been recovered from Navacoyan. Many are of highly polished red, black, and white and appear to be of west coast origin. Some pipes are in the form of a squash while others are bird-effigy in style. The assemblage of projectile points is extensive. Many of the points are quite similar to those of the Hohokam Colonial and Sedentary Periods (McGregor, 1941) and to the Upper Pima Period (DiPeso, 1956). A few large points have been found, up to three inches in length, but many are less than one centimeter in length.

Navacoyan was apparently a very important crossroads in Pre-Colombian times. Having hot and cold running
springs, a good defensible position, and situated in a rich valley with good water, it must have offered an excellent location for numerous cultures over time to cross paths and exchange goods.

**The Aztatlan Horizon in West Mexico**

The Aztatlan Horizon in West Mexico dates from approximately A.D. 900 to A.D 1350. The region of West Mexico generally includes the coastal areas of the present-day states of Jalisco, Nayarit, Sinaloa, and southern Sonora.

Prior to approximately A.D. 600 there had been no known intrusion of central Mexican cultures into West Mexico. By about A.D. 750, there were beginnings of strong signs of Mesoamerican traits, and by A.D. 1000, the pan-Sinaloan culture had many contacts with Early Post Classic cultures in the Valley of Mexico, primarily early Aztec. Ekholm (1942), who excavated the Guasave site, and Kelley and Winters (1960) reported the existence of many elements of the central Mexican culture there. Many of the traits were so strong that Ekholm suggested that they may have been introduced by actual migration from the Valley of Mexico. Similarities are seen in ceramic style and design, mortuary evidence
Map 8. Approximate area of the Aztatlan Horizon in West Mexico.
ceremonialism, and ceremonial art.

Through trade and exchange, Mesoamerican traits such as elaborate stylized polychrome painting of serpents, birds, and people in feathered headdresses, as well as the beginnings of metallurgy and metal products introduced to West Mexico from Ecuador, moved northward toward the Southwest. Evidence of contact and exchange is found by the occurrence of artifacts of Southwestern style such as shaft polishers, bilobed beads, general shellwork, and a stone pipe appearing in the Guasave culture in West Mexico (Ekholm, 1942).

Considering the amount of evidence to support the trade route, it seems that Mesoamerican influence moved from the Valley of Mexico through West Mexico on its way to the north. This evidence coincides with the idea that most of the Mesoamerican contact with the Southwest did not move through the east side of Mexico but rather moved northward west of the Sierra Madre, following the chain of trade centers located in the Northwest Mexico corridor.

The Sinaloan coast was apparently settled by Mesoamericans who had originally been guarding the frontier against the northern barbarians, the Chichimecas (Kelley and Winter, 1960; Meighan, 1971). By A.D. 900
this region had entered the Aztatlan phase. They made many Mesoamerican products such as elbow pipes, molded spindle whorls (Hargrave, 1970), solid-form figurines with coffee bean eyes (Kelly, 1938; Meighan, 1971), legged vessels, bird-effigy whistles, clay masks, and cylinder stamps (Ekholm, 1942). Many of these products were traded to Chalchihuites (Kelley and Winters, 1960). Numerous luxury items were manufactured of copper, gold, and silver by the Aztatlan metalsmiths. The craftsmen at Guasave were also skilled at paint cloisonne, very likely having been influenced by the Tarascans from Michoacan. The Tarascans, successful in blocking many of the Aztec attempts to trade to the north, had extensive contact with West Mexico.

In the southern part of West Mexico are some of the most impressive obsidian mines. One thousand two hundred sixty-four quarries or mine entrances have been recorded in this region (Weigand, 1982). Over fourteen thousand tons of artifact-quality obsidian is estimated to have come from these mines, mostly during Post Classic times, though some was also extracted during the Classic Period. Most of this raw material was worked into core blanks before being transported to the Las Cuevas site. Here was located a large workshop
which specialized in blade production for export to the Chalchihuites cultures (Spence, 1972).

As the existing culture was replaced around A.D. 900 - A.D. 1000 by a series of central Mexican cultures, the La Joya region underwent massive exploitation of the natural resources, mainly obsidian. After extraction and preparation, the core blanks were transported, probably by canoe due to the easy water access, to Las Cuevas for production of fine prismatic blades. In the long distance exchange network from the region, the prismatic blades produced at Las Cuevas were the most important commodity. La Joya obsidian has been identified by source analysis in Amapa, Nayarit; the Chalchihuites and Loma San Gabriel cultures in Durango; the San Blas area in Nayarit; the Marimas Nacionales area in Sinaloa; and the Higuera de Abuya site, near Culiacan, as well as numerous other sites not as yet positively identified (Weigand, 1982).

Another small commerce and trade network in West Mexico involved clay mined for the use as fine paste pottery. Unlike the fine Orangeware in Teotihuacan of which the origin of the clay is still unknown, the source of the clay is known, as well as the manufacturing sites and trade perimeters.
There were two types of pottery made with this clay. One is known as Nahuapa Red and Black on Buff and the other is called Nahuapa Buff Incised. The mine for this clay is in the Tomatlan River Valley, Jalisco. Most of the artifacts are small bowls manufactured in that valley. It appears that the Tomatlan River Valley may have been a social, political, and economic center, based on the distribution of sherds (Mountjoy, et al., 1982). Nahuapa Red Incised has been found one hundred kilometers to the south of Tomatlan at Barra de Navidad, Jalisco (Long and Wire, 1966), and at Morett, Colima (Meighan, 1972). The School Museum of Puerto Vallarta, Jalisco displays Nauapa Red Incised pottery from the Banderas Valley, seventy kilometers to the north of Tomatlan. Based on the archaeological evidence, perhaps Nahuapa, the provincial capital and the main marketplace in the Tomatlan Valley, served as the distribution center for foreign as well as the local fabricated pottery.

In the northern part of West Mexico was the Rio Sonora culture. The Rio Sonora culture encompassed all the best routes of travel between Mesoamerica and the Southwest on the west side of the Sierras. The term "Rio Sonora culture" was first used by Amsden (1928) over fifty years ago to denote common traits
found to be characteristic in numerous sites in the upper Rio Sonora and Rio Moctezuma in the present-day state of Sonora. Some of these are common architectural features, ceramic traditions, and similar settlement patterns.

This region also has all valleys aligned in a north-south direction, again facilitating easy trade access from Mesoamerica to the Southwest and return. These routes of communications are well watered and can support large populations as well as the transient trocadores. The parallel running valleys, none of which runs the entire length of Sonora, are of easy access to each other for travelers moving north or south.

Mesoamerican traits such as overhanging manos, ceramic spindle whorls, and ceramic cylinder stamps have been found in the Rio Sonora area with incised pottery and rectangular stone house foundations. In addition, locally made corrugated pottery has been found in several Rio Sonora culture sites farther to the south.

Concerning trade and contact to the north, the Rio Sonora culture had close ties with Casas Grandes, in Chihuahua. There are many similarities of incised pottery as well as structural likenesses in house
construction (DiPeso, 1968). Other examples of ties between these two cultural areas are painted cloisonne sherds, figurine fragments, molded spindle whorls, marine shell objects, copper tinklers, and style of public architecture.

This region, with the most easily traveled commercial routes, very likely had a trade system that could be broken into four types (Pailes, 1978). First, there were the local overlapping trade networks. This involved immediate neighbors to the north and south exchanging local items on an egalitarian basis. Second, again a local overlapping trade network existed with neighbors to the immediate north and south but characterized by local social differences. As in most societies, some people have a higher social standing than others and these people would have traded within their social level. Third was the long distance trade. This unlike the local trade, involved transporting goods over a great distance by local transporters who carried the product the entire distance themselves. This encompassed traders moving with goods to such far reaches as Chaco Canyon and Zuni regions to the north. This follows closely the Christaller (1933) theory that the range of a good is rational and efficient based on an economic point of view. The higher value a
good has, the farther it will travel in exchange. When the early Spanish adventurers such as Cabeza de Vaca first came to the Southwest, they recorded encountering long-range trading parties moving great distances. Fourth were the well-known pochteca or trocadores. They were the Mesoamericans engaged in trade over long distances. However, the trocadores would have mostly traded with the elite, for they themselves would have held high status and carried status-linked luxury goods. They probably would not have engaged in trade with utilitarian objects but would have emphasized exotic or luxury goods to be used by the elite class.

Each of these four types of trade generated a distinctive pattern in relation to community and settlement patterns. With one, such as the first, only a generalized distribution of foreign goods would be found, having no significant concentration. The fourth type on the other hand, would show evidence of a product from one area appearing in a concentrated area in another region, but with no evidence of that good anywhere between the two distant locations (Pailes, 1978).

It is possible in this situation that trocadores from Mesoamerica exchanged goods with the upper class at centers such as La Quemada or Casas Grandes, with these
centers serving as break-of-bulk or warehouse centers. Then some of these items might have been relayed via long range trade to centers such as Pecos or Chaco Canyon.

Casas Grandes

Casas Grandes, or Paquimé, the name used by the local population (DiPeso, 1974) may have been the most important of the northern trade centers established by the cultures from the Valley of Mexico. It carries all the indicators of influence from Mesoamerica such as architectural style and religious ceremonialism. The region is well watered year-round and extensive irrigation systems aided in crop production to support the permanent populations as well as to provide a surplus for the trocadores moving north and south through the Northwest Mexico corridor.

This region is still wild country. Adolph F.A. Bandelier was the first modern anthropologist to visit the region and in 1885, during his trip, the area was still occupied by the Apaches. Moving through this area one hundred years later, in 1986, I gained a first-hand awareness of the ruggedness of the topography and the abundance of natural resources. As previously mentioned,
movement is not difficult as long as one follows the north-south orientation of the mountains which cover eighty percent of the region. However, trying to move east-west across the backbone of the ridges is extremely difficult. Today the region around Casas Grandes is rich in farming and cattle raising due to the abundance of water, and the mountains are heavily forested, providing for an active lumber industry.

The drainage of the region is to the north. The streams terminate in lake beds which provide a source of salt, both for local consumption and for trade. The principal valley is known as the Casas Grandes valley and is the center of the northern Sierras. According to Charles DiPeso (1968), this physical advantage "drew prehistoric peoples like a magnet" and undoubtedly was the dominant center of the region. The archaeological and historical records reveals that this area has always been a highway for the transmission of culture (Lister, 1958).

Casas Grandes, like other centers of the Greater Southwest, is characterized by such Mesoamerican features as massive structures of stone or adobe, irrigation systems, canals, the plumed serpent motif (DiPeso, 1966), the shift from bichrome to polychrome pottery, T-shaped
Figure 3. Photographs showing the perennial streams and the rugged terrain in the Casas Grandes region. (Photographs by author)
Map 10. Rugged Casas Grandes region with north-south oriented mountains. (Map from Charles DiPeso)
doorways, raised hearths, and human sacrifice. Also evident is architecture common to Mesoamerica; the town court, round stone houses, stairways, pyramidal structures, ball courts, and truncated mounds. If this was the largest trading center in the region (ibid.) with its influence extending throughout the Greater Southwest, then these features would be expected to be in evidence.

Of the Mesoamerican features at Casas Grandes, two that are quite visible still today are the water system and the roads. The city had a dual water system that was built with a preconceived plan. There were lines to bring fresh water into the center as well as lines to carry away sewage and storm waters. The drains were mathematically sized; larger courtyards had proportionately bigger drains. The system was constructed prior to the walls, for the drains run under and parallel to the massive wall network. This system is quite similar to the drainage systems at Teotihuacan (Linne, 1934; Peterson, 1959; Cox, 1962; Sanders, 1965) and to the drainage system at Pueblo Bonito, Chaco Canyon (Judd, 1964; Vivian and Mathews, 1965). At Casas Grandes there are over four hundred meters of carefully designed drain systems in the ground (DiPeso, 1974).
Extensive roads and trails have been located near Casas Grandes. When the Spanish chronicler Obregon visited the region in 1560, he wrote "We have found paved roads here." Since then, others such as Bandelier (1892), Schwatka (1899), Lumholz (1902, Sayles (1936), and Brand (1943), as well as extensive coverage by the Joint Casas Grandes Expedition which studies over two hundred kilometers of roads, have commented on these pathways and trails. DiPeso (1974) reports some to be worn twelve or eighteen inches deep and firmly constructed up to eight feet wide with some of the steep trails cut into live rock to facilitate travel.

The *trocadores* brought to Casas Grandes religious ideas and viewpoints as well as goods. At least four Mesoamerican religious complexes involving the worship of Quetzalcoatl, Xipe Totec, Xiuhotecutli, and Tlaloc were present at Casas Grandes (DiPeso, 1974). It is safe to say that the substantial amount of contact with Mesoamerica brought these dieties and their corresponding rituals into the Southwest. These different complexes were probably not all introduced at the same time but each arrived separately with the traders coming north to the frontier.

A good example of the wide-spread coverage of a
religious belief would be the two-faced god. There have been forty-four two-faced gods uncovered at Casa Grandes while similar types have been found in the Valley of Mexico (von Winning, 1970), at Tlatilco (Kubler, 1962), in Jalisco (Covarrubias, 1957) and Colima (von Winning, 1970) in West Mexico, and Hopi twin-headed war god kachina to the north.

Burial practices is another of the connections to Mesoamerica. Numerous Mesoamerican codices (such as Codex Mendoza) portray the sacrifice of turkey blood and heads to the gods, accompanied by the beat of ceramic hand drums. At Casas Grandes hundreds of headless turkeys and ceramic hand drums were excavated from grave sites. Also, the number of turkey bones recovered in the Casas Grandes site suggests they brought wild birds from their natural habitat in the mountains and kept them in pens in the city to be used in the ceremonies (DiPeso, 1974).

Casas Grandes is well known for its beautiful polychrome pottery. Generally it is red, brown, and black on white and there are zoomorphic and anthropomorphic in addition to geometric pottery designs. The source of the white clay for the pottery is in the Dos Cabezas mountain range approximately sixty kilometers to the east of Casas Grandes. Surface metal deposits in this
area served as a material for glaze paint. Further
descriptions of the beautiful Casa Grandes polychrome
pottery can be found in material by Amsden (1928),
Brand (1935 and 1943), Hawley (1936), Kidder (1916)
and Sayles (1936a), as well as DiPeso (1974).

Ceramics are a well recognized time and space
indicator of commerce and trade. Casas Grandes pottery
has been found at such distant locations as Mesa Verde,
Colorado, Webb Island, Texas, the northwestern Sonora,
and south to the Valley of Mexico. Ceramic trade
coming into Casas Grandes arrived from seven generalized
areas, four from the north and three from the south.
The four regions to the north were the Rio Grande Valley,
the Mogollan district, the eastern portion of the Gila
Valley, and the Desert Ocotan province of southern
Arizona. Imported pottery from the south came from
the Chalchihuites cultures in Durango, from Nayarit,
and from peoples in Jalisco (DiPeso, 1974).

Over periods of time changes in trade items and
patterns are apparent. For instance, during the Paquime
Phase (after A.D. 1060), the ceramic pattern indicated
a shift in northern trade wares with Gila, Tonto, and
Tuscon polychromes (ibid.) becoming popular. The use
of copper in the form of needles, bells of the cire-
Map 11. The extensive diffusion of Casas Grandes pottery.

(Map from Charles DiPeso)
perdue (lost wax) method, and pseudoGloisonne became popular, indicating trade with West Mexico. Also, artistic designs began to feature plumed serpents as well as the macaw, and a new ceramic hand drum decorated in red and green paint began appearing, both indicating increased influences from Mesoamerica.

DiPeso(1974 surmised that the introduction of Mesoamerican traders into the Greater Southwest was financed by well-established economic sponsors from the south. They would have had to be not only wealthy enough to finance these trade excursions but also powerful enough to ensure the safety and success of the traders. Perhaps the traders initially began dealing in government-supported ventures and then began to separate themselves from these controls and establish themselves in the new market areas and carried on mixed operations, state sponsored and private enterprise.

In both the Old and New World, patterns of neolithic trade systems centered around obsidian, minerals such as turquoise or lapis lazuli, or marine shells. As Casas Grandes, two of these three were major exchange items. The marine shell trade at Casas Grandes is evidenced by the seventy different species, including both bivalve and univalve, which have been uncovered. One warehouse was excavated and literally millions of shells, over
Figure 4. This copper turtle is an example of the exquisite metal work from West Mexico found at Casas Grandes.

(Photograph from Charles DiPeso)

one and one-half tons, were being stored, presumably for trade. Work had already been done on many in preparation for jewelry or ornaments. When the inventory was compared with shell imports from other Greater Southwestern trade centers such as Snaketown (Gladwin, et al., 1937), Los Muertos (Haury, 1945), and Pueblo Bonito (Judd, 1954) on the west side of the continental divide and Swarts Ruin (Cosgrave and Cosgrave, 1932) and Pecos (Kidder, 1932) on the east side, an intricate and perhaps
competitive marketing pattern was revealed (DiPeso, 1974). Additional information concerning marine shell trade is covered in the section on Snaketown, which was located on major marine shell trade routes.

Other warehouses contained turquoise, salt, selenite (clear gypsum), bulk raw ricolite, and copper ore, as well as stacks of polychrome pottery. These were apparently being stored to be used as exchange items. As at Teotihuacan, excavations have shown that specific
areas were occupied by specialists. Some areas contained
the bulk of raw metal, indicating the location of
metallurgy. Chips are abundant in other areas used
as the location of lithic industries. Still other areas
featured ceramic production, and another evidently was
the location of macaw breeding (DiPeso, 1974) (see
figure 5).

Besides marine shells, minerals were an important
exchange item at Casas Grandes. Turquoise, which may
have provided the initial attraction for the southern
traders, was found in large pieces. Over one hundred
kilos of serpentine was found in Casas Grandes warehouses.
Sepiolite (meerschaum), mined two hundred sixty-two
kilometers north of the city, was used in pipes and
pendant-like objects. Obsidian was imported from the
Chalchihuites culture mines seven hundred fifty kilometers
to the south. And alibates, used as a special cutting
tool material, was mined near present-day Amarillo,
Texas, approximately seven hundred sixty-five kilometers
to the northeast, and was traded through Pecos to Casas
Grandes (Kidder, 1932).

However, even with this impressive list of trade
items, perhaps the most important, or luxurious, exchange
good from Casas Grandes was the scarlet macaws. They
completely dominated and controlled this market. The center did not permit the sale of eggs, nestings, or breeder birds to outside markets (DiPeso, 1974). Archaeological evidence has uncovered only three scarlet macaw breeder birds in the entire Southwest north of Casas Grandes, thus substantiating the center's ability to maintain exclusive control of this precious commodity. Special bins or pens were constructed in the plazas for storing and breeding the birds. In the ruins of Casas Grandes were recovered the remains of over three hundred scarlet macaws of various ages that were being raised for commercial enterprise.

Casas Grandes probably did not meet its demise because of the encroaching arid region during the extended dry periods, as La Quemada did. However, it did lose its importance in the trade network as other regional centers fell and trade was greatly reduced (DiPeso, 1974). The trade route across the frontier between northern Mesoamerica and the Southwest was closed around A.D. 1300 due to violence and local warfare that had burned centers such as La Quemada. The trade route was not reopened until after the arrival of the Spanish when their mining and trade enterprises again opened the region to traffic. (Weigand, 1982).
Figure 6. Modern distribution of five bird species found at Casas Grandes which are not indigenous to the area.

(From Charles DiPeso)

Hohokam Culture

The Hohokam culture, and especially Snaketown, its major center, began receiving Mesoamerican influence prior to A.D. 1 (Haury, 1978). In this region decorated
pottery has been excavated having virtually identical designs and layout patterns in both early Hohokam (Estrella Phase 100 B.C. - A.D. 100) and early Mogollan (Pine Lawn Phase 150 B.C. - A.D. 500) village sites (Gladwin, Haury, Sayles, and Gladwin, 1937; Jennings, 1956). Two of these types, San Lorenzo Red-on-Brown and Estrella Red-on-Grey, are the oldest Southwestern painted wares yet found. They are hemispherical bowls with a quadrant interior decoration in broad lines and nested triangles.

This same design on bowl interiors appears in the Valley of Mexico at Tlatilco in the Middle Preclassic (800 B.C. - 100 B.C.) (Pina Chan, 1958) and in modified form at Ticoman in the Late Preclassic (400 B.C. - 100 B.C.) (Vaillant, 1931). At Chupicuaro, on the Michoacan - Guanajuato border, the same design occurs on Chipicuaro Red-on-Buff Polychrome of the Transitional Period (Porter, 1956). Since the pottery from this region dates from approximately 100 B.C. to A.D. 100, the time sequence is practical for introduction into the Southwest by A.D. 100. Bates (1903) has illustrated two bowls from La Quemada that Porter (1956) identified as "without question of Chupicuaro origin", thus adding to the belief that Chupicuaro, or some of the northern
Map 12. Location of Snaketown and Hohokam Culture region.
outposts of this culture in Jalisco or Zacatecas, was the source of the first painted wares introduced to the Hohokam and Mogollan. Considering the ceremonial significance of the pottery layout in northern Mesoamerica and in historic times in the Southwest, it is probable that the associated concepts of ceremonialism were introduced at this same time (Kelley, 1966).

Snaketown experienced a long period of Mesoamerican influence. It began, according to Emil Haury, prior to A.D. 1 with agriculture and irrigation, some pottery, and sculpture. In agriculture it is known that the relatively highly evolved Pima-Papago maize was being raised in the Chalchihuites culture area before it was introduced into the Hohokam culture. The drought-resistant qualities of this corn (Calinat and Gunnerson, 1963) allowed it to grow at lower elevations and greatly increase the yield. However, this type of maize requires more care in planting, cultivation, and harvesting, with particular attention being given to the time of planting because of the longer growing season needed. It may be that this evolved maize was introduced to the Hohokam accompanied by the appropriate ceremonial technique for growing it (Kelley, 1966). Certainly
once the farmers of the Southwest were able to produce a surplus of food there were major changes in their lifeways.

By A.D. 300 to A.D. 500 the Mesoamerican cultures were well established in Durango and Zacatecas and their continuous movement to the north was so all-encompassing that by the time of the decline of the Chalchihuite cultures the Mesoamerican traits introduced to the Hohokam were established to the point that it could be said that there was a Mesoamerican acculturation of the Hohokam (Haury, 1978). By A.D. 500, Mesoamerican influence items included cotton added to the agricultural repertoire, macaws, and more styles introduced in pottery and sculpture, such as Chac Mool-type figurines.

Between A.D. 500 and A.D. 1200 Snaketown experienced the heaviest period of influence from Mesoamerica. The ball court was introduced, copper items were present, and tepary beans became a part of the agricultural line. Bird serpent motifs and the symbol of the trocadores began appearing on pottery. More variations in pottery and figurine styles appeared, such as articulated figurines and detailed effigy vessels. More personal ornamentation is found, like ear spools and mosaic pieces. Haury (1978) considers the A.D. 500 to A.D.
1200 period as a time of great activity in Mesoamerica and high receptibility in the Hohokam region, with this state of affairs conditioned by eight hundred years of exposure and contact.

Snaketown was also located on a major marine shell trade route. Shells were coming from the coast of California and from the Gulf of California in Mexico, and some species from the Atlantic Ocean (see Map 13).

According to Donald Brand (1938), one hundred thirty-two archaeological sites excavated in the Southwest contained sixty-six different identified species of marine shells. Of these, fifty-seven are of Pacific Ocean origin and nine are from Atlantic waters, giving good indications of how extensive the marine shell trade was.

Fully ninety percent of the marine shells from these archaeological sites had been worked, indicating emphasis on ornamentation, rather than use as possible food containers. There is no evidence, archaeological or ethnographic, for the use of marine mussels for dye, textile, or currency use in the Southwest as was common among many Indian groups. Also, shells were only infrequently used for tools such as needles, awls, or hooks. Thus far it appears only Pacific Ocean
Map 13. Major marine shell trade routes in the Southwest
(From Donald D. Brand)

and Gulf of California shells were in use during the
Basketmaker time (A.D. 400). Later, around A.D. 600,
Atlantic Ocean water species were introduced into the
Southwest.

Not coincidentally, the sites in the Greater
Southwest with the largest number of species of shells,
such as Snaketown, were located near the confluence of
the Pacific/Gulf of California trade routes and other major routes. These trade routes were used so extensively that even in the Atlantic drainage region, more than ninety percent of the archaeologically-recovered shells are of Pacific water origin (Brand, 1938).

After A.D. 1200, Mesoamerican influence drastically declined with the addition of compound-style architecture being the only major change. The A.D. 1200 date correlates with the fall of the Toltec culture and its frontier trading centers such as La Quemada and Chaco Canyon. The later rise of the Aztecs, even with their organized trading networks, had little impact though on the Hohokam because the Hohokam culture had also climaxed and declined by then.

Pecos

The Pecos site is located east of present-day Santa Fe, New Mexico. Carroll Riley (1978) view Pecos as a major trade center. More than just a trade center, he prefers to call it a "redistribution center." Riley believes that the local residents of the center used one, (Following Page)

Graph 2. Mesoamerican influence on the Hohokam Culture over time.

(From Emil Haury)
two, and possibly three goods as a standard of money (ibid.) This would have made Pecos unique among the Southwest centers. Perhaps in trade and exchange to the east, this may have been the normal procedure.

In general, extensive trade was conducted through Pecos to the Southwest and to the east. The first Spanish contact with Pecos Indians found them already extensively involved in trade. The Spanish party, led by Coronado, initially ran into what they described as a trading party. It was written that the local Indians were trading maize, cotton, blankets, and tobacco to buffalo hunters from the north for tallow, hides, and fat (Hammond and Rey, 1953). In 1880, a local informant described to Adolph F.A. Bandelier how the long range trade was conducted. The round trip took approximately two months while the actual trading only took about five days.

Through Pecos from the east to west were traded hides (of which many were worked), meat, tallow, alibates flint, fibrolite, certain kinds of shells, and cherry wood. From the west to east were traded turquoise, shell, coral, copper, piñon nuts, woven cotton, obsidian, and salt. Some scholars such as Kidder (1932) look at Pecos as a manufacturing center for shell ornaments.
and pendants because of the large amount of debitage of shell from the Pacific uncovered there. The alibates flint (agatized dolomite) was widely used at Pecos and was an excellent trade item. Again from the large amount of debitage it appears that flint tools were manufactured at Pecos.

There was a large array of ceramics coming into Pecos. Possibly ceramics were warehoused there for trade to other centers, for pottery sherds from as far as Kansas to the east and the Valley of Mexico to the south have been excavated. However, exact dating is not possible since the stratigraphic level is not known.

Turquoise artifacts from Pecos are a curious matter. Although there is extensive turquoise found to the west in New Mexico and Arizona, very little was found at Pecos. Kidder (ibid.) believed that turquoise was such an important trade item that it was seldom even used in burials. Riley (1975) also pointed out the same situation at Hawikuh, to the east of Pecos, and since both sites are situated on main trade routes, that is a distinct possibility.

Pecos, located east of the continental divide, is situated with great access to major trade routes down the Rio Grande, Canadian, Red, Arkansas, and Pecos Rivers.
Map 14. Location of Pecos and Chaco Canyon in New Mexico
The large amount of exotic materials found at the Pecos Pueblo excavation, as well as ethnographic information gathered, give good credence to the possibility of a major redistribution center for an extensive trade network to the plains, to the west, and south to Mesoamerica.

**Chaco Canyon**

Located in the northwestern part of the state of New Mexico, Chaco Canyon represents the northernmost extension of major Mesoamerican influence in the Greater Southwest, yet it appears to have had a direct link to the south. Kelley and Kelley (1975) describe this situation as an example of "hard" diffusion while Schroeder (1966) calls it an example of "patterned diffusion." Although two different terms are used, both authors agree that Chaco Canyon has an abundance of evidence to substantiate contact with Mesoamerican cultures. A new tradition, more than isolated individual ideas, was introduced.

Basically the population center was located on a strip of land approximately ten miles long and one mile wide situated between canyon walls. It is in a desert land with a few juniper and piñon trees, having an
average elevation of six thousand five hundred feet. Pubelo Bonito occupies the central location of the numerous complexes.

It now appears that the people who assumed leadership of Chaco Canyon did do, at least in part, for economic reasons. One of the aspects of the leadership was that agricultural goods were gathered and stored at the centers and distributed on a controlled basis. Also, there was a great amassing of items for trade and exchange. In addition, there was a tremendous amount of religious architectural construction, much of it having similarities to Mesoamerican architecture and ceremonialism. In comparison, all the buildings ever erected by the entire Navajo tribe, with three times as many people as Chaco Canyon totalled, would only equal a small part of the structural work in Chaco Canyon (Hewett, 1936; Lister and Lister, 1981).

Although some Southwesternists continue to cling to a model of internal development at Chaco Canyon, the collected data point more and more to a development strongly influenced by Mesoamerica. This has been presented by Kelley and Kelley (1975) using the trocadores model of contact. Others look to an actual movement of people from Mesoamerica with the purpose of exploiting
the precious raw material turquoise (Frisbee, n.d.)

Chaco Canyon developed in an unusual manner. The majority of the trading and population centers being discussed in this thesis developed over an extended period of time. However, Chaco Canyon appears to have risen rather suddenly and with little forewarning from the simple Pueblo II complex that preceded it. It also coincided with the expansion of the Toltecs from Tula, Hidalgo, and their search for turquoise stones.

Research shows that the way of life in the Chaco region during the period A.D. 600 to A.D. 1000 was very much like that of their contemporaries residing in the region of the San Juan drainage at centers such as Mesa Verde and Kayenta. There were minor variations in life styles and pottery, but they were basically similar. However, beginning with the Pueblo III phase (A.D. 1100 – A.D. 1300), Chaco Canyon deviated from the standard life styles and new traits making their appearance in Chaco Canyon can be identified as Mesoamerican. Many items found at Chaco Canyon had widespread distribution in Mesoamerica, but in many instances, the closest known occurrences outside the area were in Zacateca, Durango, and Chihuahua in northern Mexico. The time sequence of these influences reaching and affecting Chaco Canyon coincide with the
period of central Mexican cultural attributes spreading into the areas of the Gran Chichimecas.

Chaco Canyon also has, like La Quemada, an extensive road network. Over two hundred miles of roads have been surveyed and charted (Ware and Gumerman, 1976). In some areas, retaining walls of stone have been built and back-filled with rubble to make a smooth surface. In other places where the roads cross steep grades of native rock, steps have been but into the surface to allow travelers easier access. Perhaps these roads were used to bring in provisions needed by the population working the turquoise. They also could have been used to bring to the centers foodstuffs for storage and distribution on a regulated scale.

Almost certainly, the tremendous size of the pueblos and kivas was not designed to meet the needs of internal growth. As in the growth of the center as a whole, the construction of structures is rapid. Instead of following a normal growth pattern of small structures getting larger, dendrochronological dating indicates large kivas preceded the smaller ones. This fits with the belief that this trait was initially introduced from outside the region and slowly deteriorated with the Chaco Canyon phenomenon (Schroeder, 1966). Another ongoing controversy
Map 15. The network of prehistoric roads at Chaco Canyon extends over 200 miles.

(Map from the National Park Service)
concerning structural features are the bi-wall and tri-wall construction methods. Kelley and Kelley (1974) say the tri-wall structures may have served as trading centers for Mexican trocadores; however, this idea is still subject to much more investigation. There is the strong possibility that the bi-wall and tri-wall structures may have been ceremonial platforms, but if this is true, the concept still came from contact with Mesoamerican people as they are similar to structures at Casas Grandes in Chihuahua and Ixtlan del Rio in Nayarit (personal observation).

If this were an intrusion into the region from Mesoamerica, what was the motivation? The ongoing drive to possess turquoise seems to be the principal cause. Chaco Canyon does not have a turquoise source at its site but it is relatively close to several major areas rich in the mineral, including Cerrillos, New Mexico. The excavation of over five hundred thousand artifacts of turquoise at Pueblo Bonito alone substantiates the belief that the processing of turquoise was the major function of artisans of Chaco Canyon.

Reyman (1971) states that turquoise was the "big business" at Pueblo Bonito and that it was the exchange item responsible for the Mesoamerican trade network from
Chaco Canyon. Since Chaco Canyon did not have a raw turquoise source at its site, it was mined and transported to the center.

Several sites show concrete evidence of prehistoric mining for turquoise (Jenson, 1985). Turquoise Mountain in Mohave County, 20 miles from Kingman, Arizona, had mining operations for hundreds of years prior to the Spanish arrival. The outcropping rocks are seamed and veined with high grade and highly prized ore. Excavations, now overgrown with mesquite trees, are in the form of trenches, cuts and pits. Mining implements such as stone hammers, and mauls were found in numbers. They ranged from four or five inches to nine or ten inches in length and from four to fifteen pounds in weight. These hammers were grooved to receive a rawhide band or wooden handle (Blake, 1889).

Another aboriginal mining location was in Cochise County, twenty miles from Tombstone, Arizona. Today this is the area known for the Bisbee Blue turquoise, now prized in modern jewelry. An excellent grade of turquoise was also prehistorically extracted from a site in the Burro Mountains, close to Silver City, New Mexico.

However, perhaps the largest excavations were at
Las Cerrillos, close to Santa Fe, New Mexico. This was the closest major mine to Chaco Canyon. Here aboriginal mines honeycombed the mountainside in search of the precious turquoise. There was a major cave-in in A.D. 1680, but modern explorations have revealed shafts, tunnels, caves, and subterranean chambers made by early miners during extraction of the mineral. Also found here were ancient mining tools, one a hammer that weighed over thirteen pounds (ibid.) All of these mining sites could have contributed to the raw turquoise that was transported to Chaco Canyon for manufacturing artifacts.

Many changes came with the introduction of traits from the south. There is evidence of increased productivity, greater population density, specialization in production, redistribution of goods (for which Chaco Canyon is well known), exploitation of several ecological zones, public works including building construction and water control and irrigation systems, as well as a central agency control of economic, social, and religious activities (Judd, 1954).

Of course, the authority figures would hold the high status positions. This change from an egalitarian society is quite evident in status differentiation of graves of the elite. The location, arrangement of the
burials, and the full extension of the deceased are all almost certainly derived from Mesoamerica (Stanislawski, 1963). Included among interred items were copper bells, parrot skeletons, turquoise beads, pieces of jet obsidian, and a carved flute. Practically all items in the burials are of an unusual or exotic nature. Judd (1954) states the condition of some of the bodies in elite burials point toward association with the Mesoamerican Tezcatlipoca cult, as at Casas Grandes.

The list of Mesoamerican traits at Chaco Canyon is indeed extensive. However, when the distance from the Valley of Mexico is considered, it becomes truly remarkable. A joint research project conducted by the Chaco Center, the National Park Service, and the University of New Mexico has done in-depth work in studying these traits. The following are items which I believe provide good collective evidence for contact between Chaco Canyon and Mesoamerica.

1. Architectural and construction features
   a. Thick walls of worked stone veneer filled with unshaped rock, rubble, and dirt (Ferdon, 1955).
   b. Square masonry columns used to front galleries or to serve as colonades.
c. Tri-walled structures and tower kivas built in the round (Vivian and Reiter, 1960; Kelley and Kelley, 1974).

d. The use of round disks to serve as footings for wooden post roof supports.

e. Raised platforms and temples ascended by stairways.

f. Rectangular or square shaped doorways with a narrower bottom (T-shaped).

2. Ceramic objects

a. Cylindrical-shaped jars. Although common in Mesoamerica, they are almost unique to Chaco Canyon in the Southwest. Almost two hundred such vessels were excavated from Pueblo Bonito alone (Pepper, 1920; Judd, 1954).

b. Effigy vessels modeled and painted to resemble birds, humans, and other animals.

c. Shallow bowls with handles which served as incense burners.

d. Conical-shaped stamps or seals whose flat surfaces bear designs created by incisions into the clay (Judd, 1954).

e. Water and plumed serpent motifs and other Mesoamerican designs on Pueblo III Phase
pottery at Chaco Canyon (Reyman, 1971).

3. Metal items
a. Copper bells with tinklers from West Mexico.
b. Iron pyrite as used in Mesoamerica by shamans for mirrors and decorative items.

4. Shell objects
a. Conch shells with the spire ground off and sometimes with an affixed mouthpiece to serve as a trumpet (Pepper, 1920).
b. An abundance of shell beads with manufacture techniques coinciding with Mesoamerican methods (DiPeso, 1974).

5. Bone items
a. Skeletons of scarlet macaws which are native to Mesoamerica (Hargrave, 1970).
b. Ceremonial use and burial of turkeys.
c. Neatly polished, sharp-tipped bone pins, sometimes with ornamental heads, used as clothes fasteners or hair decoration in Mesoamerica.

6. Wooden items
a. Long ceremonial canes carved or crooked at one end and gradually tapered at the other. These are pictured in Mesoamerica and the
Southwest as carried by the pochteca or trocadores. Approximately three hundred seventy-five were found in one room in Pueblo Bonito (Pepper, 1920; Judd, 1954).

b. Altars carved in the flat and painted, depicting parts of birds.

7. Stone items
   a. Large amounts of worked and unworked turquoise found at Chaco Canyon indicates that it was collected and brought to the center for working. It is likely that Chaco Canyon supplied a large amount of the precious blue-green stone demanded by Mesoamerica and it was probably the most important trade item from the region going south. Over five hundred thousand artifacts of turquoise, including pendants, beads, bracelets, and mosaic sets were recovered from Pueblo Bonito alone.

8. Decorative techniques
   a. Cloisonne work has been found on artifacts of stone, wood and possibly a gourd rind.
   b. Mosaic decorations using turquoise, jet, shell, and red claystone was done on shell, stone,
bone, and basketry artifacts from Chaco Canyon (Judd, 1954).

9. Water control devices
   a. Series of canals, ditches, and headgates were used to direct water to plot of land for irrigation (Vivian, 1974).
   b. Dams of masonry and dirt were constructed to impound water for use in Chaco Canyon.

10. Communication systems
    a. Through remote sensing and ground checks the extensive (over two hundred eighty kilometers) road network has been recorded at and about Chaco Canyon. The roads connect major centers and outlying areas of population or resource areas. They are similar in design and construction to the road network at La Quemada, Durango (Ware and Gumerman, 1976; Lyons and Hitchcock, 1976).
    b. An extensive signaling system has been verified at Chaco Canyon. By utilizing smoke or fire, communications were possible between strategic positions associated with settlement location.

11. Astronomical observations
    a. Certain architectural features at several sites,
such as Pueblo Bonito, appear to have been used to establish an accurate solar calendar (Reyman, 1976a).

All of these items and traits are found in Mesoamerica and most are rare among the Anasazi except at Chaco Canyon. Some are infrequent occurrences while others were completely integrated into the culture. Those traits that were prevalent in Mesoamerica also are the ones most frequently found at Chaco Canyon.

Perhaps Chaco Canyon was initially built in its location as a central place. Turquoise raw material was reasonably close for mining, the valley offered a place for agriculture to support a larger population, irrigation systems funneled additional water to the center by using the topography, and building materials were available for construction of religious structures. Manpower was available for exploitation in turquoise mining and manufacture of artifacts. It is still not possible to positively show trocadores stimulated the development of Chaco Canyon, but a preponderance of evidence points in that direction.

When the Toltec culture fell in the twelfth century, Chaco Canyon, like La Quemada, was also abandoned by its population. However, even though the trade network was
disrupted, the trade structure continued. The demand continued in Mesoamerica during the Post Classic Period for Southwest turquoise. The Aztecs wanted the mineral stone for artistic reasons but it appears they were blocked from direct trade relations by the Tarascans from Michoacan. Even after the collapse of Casas Grandes (DiPeso, 1974) the turquoise trade obviously continued. Perhaps with the rise of the Anasazi settlements along the Rio Grande Valley in New Mexico, and their easy access to the turquoise raw material source at Cerrillos, they took the initiative and began supplying the precious mineral to the Mesoamericans.

GAMES FROM MESOAMERICA: TRAITS ACCOMPANYING TRADE

There is one Mesoamerican trait that does not directly concern trade and commerce but which is identified at almost every trade and population center covered in this paper. This is the introduction of Mesoamerican games to the Greater Southwest, in particular the ball game and patolli, the game of chance.

Ball courts have a long history in Mesoamerica, going back to the Olmecs, the probable originators of the game. It has developed and changed with time and
with the cultures in power in Mesoamerica, but the concept was carried to the farthest reaches of the trade networks.

The rules of the game and the styles of courts were different in different locations. Sometimes the game was played for ceremonial reasons, with the winning, or losing team, being sacrificed. Other times it was played for gambling and for sport and the winning team could strip the spectators of clothes and jewelry (Diehl, 1983).

Ball courts are found at most of the trade centers north of the Valley of Mexico. The Toltec center at Tula, Hidalgo, has two ball courts (Davies, 1977; Diehl, 1983) and the major trade center at Casas Grandes, Chihuahua, also has two courts (DiPeso, 1974). At Snaketown, the Hohokam center in Arizona, the ball game was being played before the fire at Teotihuacan in A.D. 650 (Gumerman and Haury, 1979). Numerous additional ball courts are found in the Southwest, including ones in the Gila Bend area (Schroeder, 1965), two at the Gatlin site (ibid.), at Painted Rocks (Wasley and Johnson, 1965), and Wupatki Ruins, near Flagstaff in northern Arizona, the northern-most ball court excavated.

The ball game became such a part of the Southwestern
Map 16. Diamonds denote locations of Mesoamerican-style ball courts
culture that the local population looked for a substitute rubber for that imported from Mesoamerica to make balls for the game. It appears that a local plant (various species of the genus Parthenium) was very good for the extraction of fluid to make rubber balls. Several of these balls have been found and one has been examined in the laboratory of United States Rubber Company (Lloyd, 1985). With this local source of rubber it was no longer necessary to import all balls from Mesoamerica. *Patolli*, the game of chance, was another of the
Mesoamerican games that diffused from the Valley of Mexico as traders moved to the north. It has been recorded ethnographically and excavated archaeologically from the Valley of Mexico to West Mexico to the Southwest.

Patolli, is a game of chance involving a surface area of lined squares and dice. Generally the object of the game, which is quite similar to the Hindu game of Parchesi, is to move from square to square, advancing through the pattern of spaces with each move being indicated by the throw of the dice. The object is to win by moving your gaming pieces through the course from start to finish before your opponent. The game probably did not have an historical connection to the game of Parchesi as suggested by Edward B. Taylor (1879), but it obviously diffused throughout Mesoamerica and the Greater Southwest.

The account of patolli being played on a mat by the Aztecs was transcribed from a native manuscript by Fray Diego de Durán, who provides the most detailed description of the game. Although no mats have survived to be discovered in archaeological excavations, patolli games are often found scratched on relatively non-perishable surfaces like stone and plaster. Outside the Classic Maya area, patolli designs have been found
at Teotihuacan (Bernal, 1963), Tula, Hidalgo (Acosta, 1960), and the Pedregal region of Mexico City (Letecia Diaz Rivera, 1986, personal communication) from the central area of Mexico. In West Mexico examples come from Angahuan, Michoacan (Carrasco, 1940), Tomatlan, Jalisco (Mountjoy, 1985), and possible board pieces from Culiacan, Sinaloa (Kelley, 1945) and Amapa, Nayarit (Meighan, 1976). Farther to the north a similar game of moving markers around a square game board track was played by the Tarahumara, Tepehan, Pima and Papago Indians (Culin, 1907).

The game of *patolli* has been played at least since A.D. 300 in the Valley of Mexico and from approximately A.D. 600 (Meighan, 1976) in its northward diffusion. As it continued north into the Southwest to the pueblos of the Hopi and Zuni in New Mexico and Arizona, the game changed slightly and the name reduced to *patol*, an insignificant change but still recognizable from the original Nahuatl word *patolli* (Garibay, 1940).

CONCLUSIONS

The Greater Southwest has undergone tremendous cultural change since the humble Desert culture beginnings. This is a well established fact. Some of these changes
Figure 7. Examples of Patolli boards

A. From Angahuan, Michoacan, recorded by Carrasco

B. From Tomatlan, Jalisco, by Mountjoy and Smith

Figure 8. Examples of Patolli boards

A. Aztec period cruciform Patolli pattern, by Duran

B. Cruciform and square Patolli pattern from Teotihuacan, by Bernal

C. Cruciform and square Patolli pattern in Vaticanus B codex
of course occurred because of the local progress of the native peoples. However, I believe an extensive amount of influence on progress and change in the Southwest derived from contact with Mesoamerican cultures.

What was the reason that caused the Mesoamerican cultures from the Valley of Mexico to look to the north? A brief re-examination of the development of centers in the Greater Southwest shows many close ties to Mesoamerica. The Chalchihuites cultures developed because they supplied the blue-green stones desired by the Teotihuacanos. The Chalchihuite region began to develop shortly after Teotihuacan began its rise to dominance. The center of Chalchihuite thrived as a mining center, but it also served as the northern outpost for the further exploration to the north of Teotihuacan. When Teotihuacan declined as the dominant power in Mesoamerica, Chalchihuites also declined.

La Quemada and Chaco Canyon were two excellent examples of the development and decline of northern centers in parallel with the rise and decline of a Mesoamerican culture, in this case, Tula, Hidalgo. In addition to the corresponding dates of rise and decline, the abundance of archaeological evidence and similarities of non-commercial traits, such as
<table>
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<th>Region or Center</th>
<th>A.D. 1-500</th>
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<tr>
<td>West Mexico</td>
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<td>Central Mexican intrusion begins by A.D. 600.</td>
<td>Trade with Casas Grandes Azatlan Horizon active from A.D. 900 to A.D. 1350.</td>
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<tr>
<td>Casas Grandes</td>
<td></td>
<td></td>
<td>Active from A.D. 900 to A.D. 1350. Trade with West Mexico. Pottery trade with South west U.S. and Valley of Mexico. Drastic decline in trade beginning A.D. 1300.</td>
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<tr>
<td>Chaco Canyon</td>
<td></td>
<td></td>
<td>Active Toltec trading center A.D. 1000-1200. Turquoise exportation to the south by A.D. 1000.</td>
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architectural styles and religious ceremonies, provide evidence of extensive contact between the Greater Southwest and Mesoamerica.

Snaketown, though, is the northern center which remains an enigma. Why was it so heavily influenced, and from such an early beginning? It did not have a natural resource such as obsidian or turquoise to serve as an attraction to draw Mesoamerican cultures to its location. It also was not located in an advantageous north-south location on a major trade route like La Quemada or Casas Grandes. Yet, by A.D. 1, evidence shows that it was beginning to be influenced by Mesoamerica and this influence continued and increased to the point, as stated by Emil Haury, that acculturation had occurred. Perhaps a local political disorder made this area more sensitive and receptive to outside influences.

I do not believe the Mesoamerican cultures were interested in conquest of the Greater Southwest, nor were they interested in a mass conversion of the peoples of the Greater Southwest to their religions. Also, I do not believe Mesoamerican cultures moved to the north with the purpose of establishing their governments and lifestyles on the people of the Greater Southwest. After reviewing the evidence gathered in this paper from
examination of the numerous Greater Southwest centers established by Mesoamerican cultures in their expansion to the north, I am convinced the overwhelming reason for this expansion was commerce and trade. Commerce and trade was the common motivating factor of all the cultures from the Valley of Mexico, whether it was Teotihuacan, Toltec, Aztec, or Tarascan, for over one thousand two hundred years. The reason for the movement of traits and ideas, and even games, was that they merely accompanied the trocadores on their missions. All traders and merchants carry with them local customs and traits as well as their goods and wares.

All these cultures extended their spheres of influence to the west and north for the purpose of establishing trade centers; they colonized for the purpose of maintaining control of mercantile enterprises, and they mined and exploited minerals, in particular, turquoise. As the centers in frontier regions grew, they expanded their limits farther north, perhaps under the direct control of the government in the Valley of Mexico, but also possibly for the reasons of increasing their own profit and power.

The combination of trade networks, exchange of ideas and traits, and actual migration of people from the south to the Greater Southwest is substantiated
by hundreds of researchers, ethnographers, and archaeologists. As work continues, a more enriched understanding of the prehistoric relationship between Mesoamerica and the Southwest will develop.
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