

- Lévi-Strauss, C. 1955. The Structural Study of Myth. In Sebeok, T.A. (ed.): *Myth: A Symposium*. Bloomington: Indiana University Press.
1960. Four Winnebago Myths: A Structural Sketch. In Diamond S. (ed.): *Culture in History*: 351-362. New York: Columbia University Press.
- Pitt-Rivers, J. 1970. Spiritual Power in Central America: The Naguals of Chiapas. In Douglas, M. (ed.): *Witchcraft Confessions and Accusations*. London: Tavistock Publications.
- Saler, B. 1964. Nagual, Witch, and Sorcerer in a Quiche Village. *Ethnology* III:305-328.
- Sapir, J.D. 1977. Fecal Animals: An Example of Complementary Totemism. *Man* 12(1):1-21.
- Scheffler, H.W. 1976. The "Meaning" of Kinship in American Culture: Another View. In Basso, K., and H. Selby (eds.): *Meaning in Anthropology*. Albuquerque: University of New Mexico Press.
- Villa Rojas, A. 1947. Kinship and Nagualism in a Tzeltal Community. *American Anthropologist* 49:578-587.
- Vogt, E.Z. 1965. Structural and Conceptual Replication in Zinacantan Culture. *American Anthropologist* 67:342-353.
- Wisdom, C. 1952. The Supernatural World and Curing. In Tax, S. (ed.): *Heritage of Conquest*: 119-134. Glencoe: The Free Press.

Waves of Influence in Postclassic Mesoamerica? A Critique of the Mixteca-Puebla Concept

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Mixteca-Puebla is a descriptive term used by Mesoamerican archaeologists to refer to a widely distributed so-called "art style" of the Postclassic period which presumably developed in the area of northern Oaxaca and Southern Puebla, Mexico. According to H.B. Nicholson, whose definition of the style is generally accepted,

During both the Toltec and post-Toltec periods, *waves of Mixteca-Puebla stylistic influence* spread widely throughout Mesoamerica (Nicholson 1960:118; emphasis added).

This "waves of influence" metaphor permeates the literature, and models based on processes of migration (Ekholm 1942:128), trade (Webb 1973:392ff.), and general religious contacts (Morley 1956:96) are invoked to explain the radiation of this "influence" from a central highland core area to the far reaches of Mesoamerica.

We find that the present conception of the Mixteca-Puebla style confuses three quite distinct phenomena to which we give the following labels: (1) the *Postclassic Religious Style*, a collection of standardized religious symbols that were popular throughout Mesoamerica, beginning in the Early Postclassic period; (2) the *Mixtec Codex Style*, a highly-distinctive Late Postclassic polychrome narrative style most commonly associated with codices, murals and ceramics of the Mixteca-Puebla region; and (3) the *Mixteca-Puebla Regional Ceramic Sphere*, the local ceramic complexes of the Mixteca-Puebla region which share several stylistic features. The first of these three categories encompasses the majority of the examples of the "Mixteca-Puebla style" found outside of the Mixteca-Puebla region, while the second and third categories represent more intensive, locally developed styles that evolved out of the first category. Failure to separate these phenomena leads to inappropriate models and faulty interpretations of Postclassic Mesoamerican cultural dynamics. In reaction to the prevailing "waves of influence" perspective, we

propose that a non-nuclear spatial model of interdependent exchange and communication networks provides a better account of the temporal and spatial distribution of the Postclassic Religious Style in Mesoamerica.

I. HISTORY OF THE MIXTECA-PUEBLA CONCEPT

The term Mixteca-Puebla was coined by George Vaillant to indicate Postclassic culture in northern Oaxaca and southern Puebla as far north as the site of Cholula. Vaillant emphasized the ceremonial nature of "Mixteca-Puebla culture" and suggested that "elements of this culture" diffused to Cerro Montoso in Veracruz, the Toltec occupation of Chichen Itza, Santa Rita (Belize), Naco (Honduras), Nicaragua, and the site of Guasave in Sinaloa (Vaillant 1940:299). He stated,

Four things are notable about the Mixteca-Puebla culture: its spread is shown mainly in terms of ritualistic presentation; there is evidence that much of the distribution was accomplished by movements of peoples; the movement seems datable as between 1100-1300; at Monte Alban and Teotihuacan, this complex replaced in the first case directly and in the second case indirectly, stable individualized local cultures (Vaillant 1940:300).

Other archaeologists adopted the Mixteca-Puebla concept both in the sense of stylistic influence from central Mexico (e.g. Ekholm 1942:126ff.; Medellin Zenil 1960:148ff.), and as a marker for Postclassic culture in general (e.g. Jimenez Moreno 1970:47; Chadwick 1971:240ff.). In 1960, Nicholson published what remains the definitive treatment of the concept. He discusses the various ways the term is used in the literature and points out that Vaillant referred interchangeably to a Mixteca-Puebla "culture", "civilization", and "culture complex", as well as to the "Mixteca-Puebla area" (see Vaillant 1940:299f.). He concludes that the concept is most useful as a referent to a distinct art style (1960:115), and using the Codex Borgia as the most representative example, Nicholson defines the "Mixteca-Puebla style" as follows:

(The style) is characterized by an almost geometrical precision in delineation. Symbols are standardized and rarely so highly conventionalized that their original models cannot be ascertained. Colors are numerous, vivid, and play an important symbolic role in themselves. In general, there is much that is akin to modern caricature and cartooning of the Disney type, with bold exaggeration of prominent features.

These generalities, however, are much less important in distinguishing the style from others in Mesoamerica than certain specific ways of representing various symbols. The presence of even one of these symbols or a characteristic grouping is often enough in itself to define the presence of the style (Nicholson 1960:115).

Among the most common and distinctive constituent symbols,

Nicholson (*ibid.*) lists: solar and lunar disks, the Venus symbol, skulls and skeletons, jade, *xicalcolihqui* (stepped-fret), serpents, jaguars, and the 20 *tonalpohualli* signs.

Nicholson goes on to define three major "regional and temporal variants": Toltec, Valley of Mexico Aztec, and the "Mixtec style proper", and suggests that other sub-styles could be delimited with further study (1960:116); in a later article (1973), he gives the Huastec art style as another variant. Following Willey's (1945) definition of the term, Nicholson calls the Mixteca-Puebla style a *horizon style* because it presumably has "(1) narrow temporal distribution; (2) broad spatial distribution; (3) stylistic complexity and uniqueness" (Nicholson 1960:116), although he notes that the style has a longer temporal duration than most horizon styles. In reviewing its spatial distribution, he amends Vaillant's list of examples to include several cases from West Mexico, the Tulum murals, and Nicoya polychrome ceramics from Costa Rica and Nicaragua; he further states that "wherever Plumbate or Fine Orange (pottery) is found throughout Mesoamerica, various Mixteca-Pueblid motifs occasionally appear" (1960:117). Despite Nicholson's work, some authors continue to be vague in their usage of the Mixteca-Puebla concept; for example, Weaver (1972) refers to Mixteca-Puebla people (p. 191), culture (pp. 218, 265, 290), polychrome ceramic style (pp. 199, 248), and ceremonial cult (p. 279). However, the majority of Mesoamericanists follow Nicholson's conception of the Mixteca-Puebla phenomenon as a horizon style; see for example Ekholm (1942), Robertson (1970a), Chadwick (1971), Webb (1973, 1978), Adams (1977:285), von Winning (1977), Sanders (1978), and Schalvelzon (1980:18f.).

We disagree with Nicholson's assessment that the Mixteca-Puebla style, so defined, is a horizon style. Representations fitting his definition occur all over Mesoamerica from approximately A.D. 800 until the Spanish conquest; 700 years is far too long a temporal span for a horizon style. A number of authors have correspondingly narrowed this time span in their discussions of what they term the Mixteca-Puebla horizon; as a result, the style has been proclaimed to be both an *Early* Postclassic marker (e.g. Webb 1973, 1978) and a *Late* Postclassic marker (e.g. Robertson 1970a; Adams 1977:285).

The inconsistent dating of the Mixteca-Puebla "horizon" by various authorities is due to the lumping of the three categories listed above under the single term Mixteca-Puebla. When Webb (1973, 1978) argues that the Mixteca-Puebla style dates to the Early Postclassic period, he is actually referring to the Postclassic Religious Style; similarly, when Robertson (1970a) and Adams (1977:285) attribute the Mixteca-Puebla style to the Late Postclassic period, they are discussing only the Mixtec Codex Style.

Sanders (1978:35) recognizes that two different phenomena are involved when he writes of "two pulses" of the "Mixteca-Puebla horizon style", one dating to A.D. 1000-1200, the other to A.D. 1427-1521. However, this phrasing is a contradiction in terms; a horizon style, by definition, cannot have two "pulses" separated by over 200 years (Willey 1945). It is time to recognize the composite character of what has been termed the Mixteca-Puebla style and to break the concept down into its temporally and geographically distinct component styles. Some of the many problems that arise from a failure to do this are elaborated below.

II. THE POSTCLASSIC RELIGIOUS STYLE

Examples of the constituent symbols of the Postclassic Religious Style appear in widely separated areas of Mesoamerica at various times during the Postclassic period. Although the style achieved its widest distribution in the Early Postclassic period (ca. A.D. 900-1100), it continued in many areas until the Spanish conquest. Before presenting specifics of the content and distribution of this style, several theoretical considerations should be mentioned; these will aid in weighing evidence for the existence of a widespread religious art style in the Postclassic period and in evaluating alternative explanations for its origin and spread.

A. Theoretical Considerations: Nuclear and Non-Nuclear Models

In a recent article, Friedel (1979) presents two contrasting models which deal with the geographical parameters of the rise of civilization and the state in the Maya lowlands. In contrast to previous explanations, which he characterizes as holding to a "culture area paradigm", Friedel argues for an "interaction sphere paradigm" which does a superior job of accounting for the data of Late Formative and Early Classic Maya culture. The *culture area* approach to cultural dynamics portrays change as originating in response to local conditions at a single locality, and spreading outward from that locality (the cultural "core" or center) to those surrounding regions which also exhibit the necessary localized conditions. The *interaction sphere* approach, on the other hand,

attributes causality in the development of complex, elite social institutions to regional conditions via an information and exchange network among elites rather than to localized conditions (Friedel 1979:50).

The culture area model as described by Friedel is an example of a *nuclear* model of cultural development, in that influence radiates out from a single center of change, while the interaction sphere model is *non-nuclear* in nature, with development proceeding

throughout a large area with no necessary temporal or dynamic priority of a single core locality. The idea of a "network" is perhaps an appropriate metaphor for the spatial configuration of non-nuclear models.

Anthropological theory is weak in the realm of cultural development over large geographical areas, and for this reason treatments like Friedel's are welcome. The recent "regional" approach in anthropology (see C. Smith 1976a) is an important advance, but its primary unit of analysis, the region, is still too small to address many problems of interest to archaeologists. Regions are usually defined in economic terms, often as the production and distribution hinterlands of a major central place (C. Smith 1976b; Russell 1972); however, in order to study such issues as the rise of Maya civilization or the spread of religious symbols in Postclassic Mesoamerica, we need to work on a "macro-regional" scale (1). At this level, little explicit theory has been developed in either anthropology or archaeology. In the face of fragmentary archaeological data and a general lack of relevant anthropological models and theory, many archaeologists over the years have relied, both implicitly and explicitly, on the one construct which does approach the necessary geographical scale: the culture area concept (see Wissler 1923:55-61; Kroeber 1939; Kirchhoff 1943). While the use of this concept appears to be valid and appropriate in some situations, it has been applied to many phenomena which, on closer inspection or given new data, do not fit its parameters at all. Recently, a number of researchers have begun to re-examine many long-standing "nuclear" explanations of archaeological phenomena, and as a result several non-nuclear models have been presented which are more successful dealing with issues of cultural development over large geographical areas than prior "spread-of-influence-from-a-center" models. In addition to Friedel (1979), notable examples of this trend are: Proskouriakoff (1968b:119), Brown (1976), Meachan (1977), Myers (1978) and Renfrew (1979) (2).

In the pages which follow, the usefulness of the waves of influence model as it has been applied to what we call the Postclassic Religious Style is compared with a non-nuclear approach. We argue that the non-nuclear model fits the relevant data more successfully and leads to more productive insights than the previous nuclear perspective.

B. The Postclassic Religious Style and Its Distribution

The Postclassic Religious Style consists of standardized representations of certain easily recognized and presumably religious symbols. The second paragraph of Nicholson's quotation in Section I above applies to this style; the emphasis is on "certain specific ways of representing various symbols" (Nicholson

1960:115). The most common symbols are the *xicalcolihqui*, also known as the "greca" or stepped-fret motif (Figure 1, a-d) and the feathered serpent in several varieties: the entire motif; feathers only; head only; etc. (Figure 1, e-h). The primary medium for these symbols is polychrome painted ceramics, which are found over much of Mesoamerica in Postclassic occupations (Castillo T. 1972). The symbols are usually arranged in one or more horizontal bands that circle the exterior of the ceramic vessel, although decorated bowl interiors are also common.

Two conditions must be met for a nuclear, "waves of influence" model to be appropriate as an explanation of the pan-Mesoamerican distribution of these symbols. First, there must be evidence for a dynamic and vigorous religious/artistic/cultural tradition in the nuclear zone (*i.e.* the Mixteca-Puebla area) which resulted in the synthesis of the style and initiated its spread outward to other areas. Second, the style must appear earlier in the core area than in the peripheral, "recipient" areas. Available evidence indicates that these two conditions are not satisfied for the Postclassic Religious Style.

The site of Cholula, a major religious and cultural center in Late Postclassic times (Olivera 1970:211-217) is generally acknowledged as the "spiritual" center of the Mixteca-Puebla style (Nicholson 1960, 1966; Gorenstein 1973:9; Schavelzon 1980:22ff.; Paddock n.d.). However, Davies points out that recent evidence

raises doubts as to whether Cholula itself in Toltec times could possibly have constituted the mighty metropolis that it had once been and was to become again in the Late Postclassic period (Davies 1977:330; cf. Nicholson 1978:315 for a similar view).

The population of Cholula appears to have been quite small during the Early Postclassic period (Davies 1977:328ff.). The revival of Cholula is now thought to have occurred in the Late Postclassic period, with the Cholulteca III phase (Davies, *op. cit.*; Dumond and Muller 1972:1209ff.; Muller 1978a:224), and not during Early or Middle Postclassic times. As for the rest of the Mixteca-Puebla area, there is little evidence for a dynamic cultural center capable of generating and spreading a religious art style throughout Mesoamerica in the Early or Middle Postclassic periods.

Turning to the second condition of the waves of influence model, it can be shown that manifestations of the style occur earlier in the "peripheral" areas than in the "central" area. Two such peripheral areas are examined here: West Mexico and the Nicoya area of Costa Rica. Before examining this evidence, however, the dating of the Postclassic Religious Style in the Mixteca-Puebla area itself needs to be considered.

1. *The Mixteca-Puebla Area.* The primary manifestations of the

style in this region are the polychrome ceramics of Cholula and the Mixteca. The Mixtec examples date to the Late Postclassic period (Spores 1972:48f.; Bernal 1970:365; Caso, Bernal and Acosta 1967:465ff.; Brockington 1973), while the Cholula examples appear anywhere from the Cholulteca I phase (A.D. 800-900) to the Cholulteca III phase (A.D. 1325-1500), depending upon whose interpretations of the site's chronology one accepts. A twelfth century origin now seems most likely (this point is discussed in part IV below). There are several examples of the constituent symbols of the Postclassic Religious Style appearing on non-polychrome vessels in the Cholulteca II phase, A.D. 900-1325 (Muller 1978a:183f.). Muller (*ibid.*:188) notes similarities in the symbolic representations on these Cholulteca II ceramics and contemporary Aztec I Black-on-Orange ceramics of Culhuacan (Sejourné 1970), another example of the Postclassic Religious Style in central Mexico. Muller's primary evidence for believing these phases are contemporaneous is the presence of imported Aztec I ceramics at Cholula, in addition to the shared designs. Aztec I is dated to *ca.* A.D. 1150-1350 by Sanders, Parsons and Santley (1979:466), which would suggest that these symbols appear *late* in the Cholulteca II phase (3).

2. *West Mexico.* The nature and intensity of prehispanic interaction between West Mexican and central Mexican cultures varied considerably over time. The two areas were closely connected in Early and Middle Formative times, relatively isolated in the Late Formative and Early Classic periods (when the shaft-tomb complex flourished in West Mexico), and then united again under the Teotihuacan empire in the Middle Classic period (Meighan 1974). During the Postclassic epoch, most authorities see "waves of Mixteca-Puebla influence" hitting West Mexico. Meighan states the predominant view as follows:

Cultures of the West Mexican Postclassic are well known from many sites with elaborate, multicolored pottery bearing Mixteca-Puebla stylistic elements clearly related to the belief system represented throughout Postclassic Mesoamerica. From about A.D. 900, there was a *tremendous spread of influence*—part military, part religious, and part mercantile—from the center of Mexico in all directions. While no true empire in the political sense can be discerned, *the cultural power was clearly in central Mexico*, and this is revealed in the west coast sites of the time. Not only the characteristic community pattern, but also the ceramics, the iconography, and most of the manufactured objects reveal the *cultural dominance of central Mexico* (Meighan 1974:1259; emphases added).

For reasons of space, discussion here is limited to the West Mexican polychrome ceramics, for these are by far the most common medium for the expression of the Postclassic Religious Style. The reader is referred to the map and table at the end of the

essay for clarification of this and following discussions of ceramic chronologies. The first polychrome ceramics in West Mexico are the Early Chametla Polychromes from Chametla, Sinaloa (Kelly 1938:11-16), which date prior to A.D. 450 (Kelley and Winters 1960:560; Bell 1971:plate 3) and show little resemblance to other polychrome styles in Mesoamerica. By the Middle Chametla or Baluarte phase (A.D. 450-650), the *xicalcoliuhqui* motif appears on polychrome designs (Kelly 1938:17). From 850-1100, the Aztatlán polychrome ceramics form a "horizon style" (Meighan and Foote 1968:158) along the coast of West Mexico; examples are Cojumatlan polychrome and the succeeding Tizapan polychromes in Jalisco and Michoacan (Lister 1949:19-28; Meighan and Foote 1968:94-110), the Acaponetla or Late II phase at Chametla (Kelly 1938:19), and the Early II (Acaponetla) phase at Culiacan (Kelly 1945:24-40; 118-120).

The Aztatlán horizon is marked by the definite presence of the Postclassic Religious Style in many parts of West Mexico. Its appearance in this area is at least as early as at Cholula, and probably earlier. However, West Mexican polychrome styles, including the elements of the Postclassic Religious Style, show an *in situ* development over several centuries (see for example the *xicalcoliuhqui* and other symbols arranged in horizontal bands in Middle Chametla ceramics—Kelly 1938:16ff.). Such a sequence of development is not found in the Mixteca-Puebla area.

In the succeeding period (ca. 1100-1250), polychrome ceramics bearing elements of the Postclassic Religious Style continue at Chametla (El Taste or Late I) and Culiacan (La Divisa or Early I), and make their appearance at Guasave (Ekholm 1942). While this period is said to show the greatest influence of the "Mixteca-Puebla style" in West Mexico (e.g. Ekholm 1942:125ff.; von Winning 1977:121), the Culiacan and Chametla polychromes actually resemble Nicoya Middle Polychrome ceramics much more closely than they do anything from the Mixteca-Puebla area (compare Meighan's 1971 figures 7 and 8 with the plates in Lothrop 1926), and the Guasave vessel forms are almost certainly southern in derivation (see below). After A.D. 1250, the Culiacan polychromes continue to develop in a unique direction through the Middle and Late periods (Kelly 1945:59-82), with few if any traits attributable to central Mexican influence. The other West Mexican regional polychrome styles are no longer found after A.D. 1250 (Bell 1974:plate 3).

3. *Nicoya*. The Nicoya peninsula of northwestern Costa Rica and the surrounding area is generally acknowledged as the southern limit of Mesoamerica during the Postclassic period, and its polychrome ceramics are listed among the recipients of "Mixteca-Puebla influences" (Nicholson 1960:117). Three-color

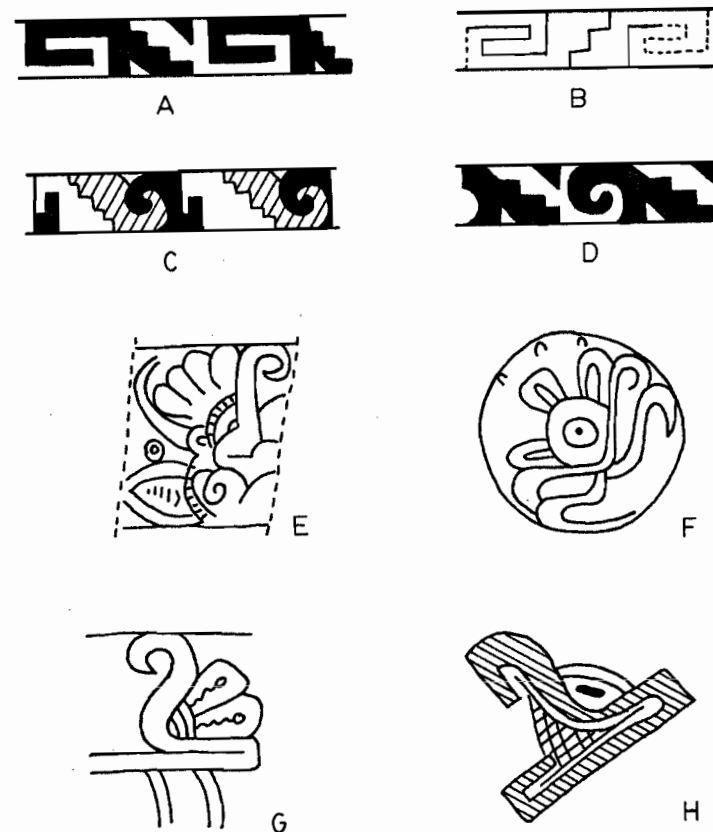


Fig. 1. *Xicalcoliuhqui* and feathered serpent symbols of the Postclassic Religious Style. Sources: A: Tizatlan, Tlaxcala (Caso 1927:1am.IIIB). B: Tizapan et Alto, Jalisco (Meighan and Foote 1968:fig. 16c). C: Nicoya, Costa Rica (Lothrop 1936:183). D: Valley of Oaxaca (Caso, Bernal and Acosta 1967:1am XXIII,14). E: Tizapan el Alto (Meighan and Foote 1968:fig. 16e). F: Culhuacan, Valley of Mexico (Sejourne 1970:fig.50a). G: Tizapan el Alto (Meighan and Foote 1968:fig. 16b). H: Nicoya (Lothrop 1936:pl.XVI,b).

polychrome ceramics first appear around A.D. 100 in the Early Polychrome A phase, also known as the Late Zoned Bichrome phase. These trichromes continue their local development into the Early Polychrome B phase around 450 (Lothrop 1966:187), while the development of Galo polychrome ceramics, which first appear at this time, is less clear (Lynette Norr, personal communication). The early polychromes (Lothrop 1926:plates 40, 69, 75; figures 72, 73, 75) show little resemblance to any Mesoamerican style; during phase B, so-called Mesoamerican traits appear, probably deriving from eastern and northern Honduras (Baudez and Coe 1962:369). The well-known Middle Polychrome Period ceramics (A.D. 800-1350) develop out of a combination of the Early B style and the Ulua polychrome style (A.D. 600-800) of Honduras, which in turn is said to contain a blend of Maya and central Mexican traits (Stone 1970, Epstein 1959).

The Nicoya Middle Polychrome style begins 150 years earlier in Costa Rica than in northern Nicaragua and Honduras (where it is not evident until A.D. 950—Baudez 1970:134), which supports the idea of an indigenous origin and development. The Middle Polychrome Period ceramics, like the contemporary Aztatlán ceramics of West Mexico, show the definite presence of the Postclassic Religious Style at an early date. Also like the West Mexican polychromes, the Nicoya polychromes show an *in situ* developmental sequence and gradual addition of symbols. In neither area is there a major break in the local development, or a reorientation to a set of new foreign symbols or styles.

The succeeding Late Polychrome phase (A.D. 1350-1550) in the Nicoya area is generally thought to exhibit considerable central Mexican influence (Coe 1962b:178; Baudez and Coe 1962:370; Baudez 1970:157; Stone 1972:186ff.). However, there is no *a priori* basis for assuming that this "Mesoamericanization" of Central America in the last few centuries before the Spanish conquest necessarily derives from influences from central Mexico. In a comparative case, the observed "Toltec" influence in highland Guatemala actually derives from the Gulf Coast rather than from the Toltec capital of Tula in central Mexico (Carmack 1970:65-70; Fox 1980). Thus the fact that Central America was increasingly drawn into the Mesoamerican cultural sphere does not necessarily mean that this was accomplished through "influence" directly from central Mexico; other "peripheral" areas were actually more strongly involved, as indicated below.

In addition to the Mixteca-Puebla region, West Mexico, and the Nicoya area of Costa Rica, the Postclassic Religious Style is also found in the following areas: (1) much of *Central America north of Nicoya* (Stone 1972:163ff.; Baudez 1970); (2) *highland Guatemala*, in the Iximche murals (Carmack and Larmer 1971; Guillemin 1965); (3) the *Huasteca* during period V or Las Flores,

A.D. 900-1200 (Ekholm 1944; Ochoa 1979:33ff., 72ff.); (4) much of *coastal Veracruz* during the same period (e.g. Cerro de las Mesas—Drucker 1943a:42ff., 82ff.; Tres Zapotes—Drucker 1943b:121ff.; and other areas—Medellin Zenil 1960:124ff.); (5) the *Chinantla* area of northeast Oaxaca (Lind 1967:34-43); (6) *Miahuatlan and the Pacific Coast of Oaxaca*, at a later time period (Brockington 1973:81ff.); and (7) the *Valley of Mexico* (in the Aztec I Black-on-Orange ceramics at Culhuacan and other sites in the southern valley, ca. A.D. 1150-1350—Sejourne 1970:figures 50-77; Peterson 1957) (4). The fact that the Postclassic Religious Style achieved such a widespread distribution during the Early Postclassic period is not unrelated to the great expansion of Mesoamerican long-distance trade at the same time. The nature of the link between these two phenomena is explored below.

C. Southern Mesoamerican Trade Routes and the Postclassic Religious Style

The Early and Middle Postclassic periods were characterized by the development of extensive trade networks throughout southern and coastal Mesoamerica. As Thompson (1939:232) puts it, this was a time of "widespread commercial activities", during which the Putun Maya expanded out of their Gulf Coast home (see Scholes and Roys 1948) to control a vigorous sea trade from the Gulf of Mexico around Yucatan to the Caribbean (Thompson 1970:ch. 1; Ball 1978:141; Andrews 1978). At the same time, other long-distance trade routes, both land and sea based, were extended over many parts of Mesoamerica (Webb 1973:392ff.; 1978; Litvak 1972; Thompson 1970:ch. 1; Navarrete 1973). The configuration of these Postclassic trade routes was quite different from prior Teotihuacan-controlled Classic period trade networks (Davies 1977:343; Webb 1978; Paddock n.d.). As Davies (1977:343) puts it, after the fall of Teotihuacan, "trade tended to revert to the coastal regions".

Two of the most prominent nonperishable trade goods were the distinctive ceramic wares known as Plumbate and Fine Orange. Plumbate was probably manufactured in central El Salvador or adjacent highland Guatemala (Shepard 1948:103), and reached its widest distribution in the eleventh and twelfth centuries (*ibid.*:115). Fine Orange, on the other hand, was widely distributed throughout the Postclassic period. It consists of a number of varieties, most of which were produced along the southern Gulf Coast area of Tabasco and southern Veracruz (Smith 1957, 1958). Most major central Mexican archaeological sites have at least one or two examples of both wares, but they are far more heavily represented in southern and coastal sites. Plumbate is relatively common in the "peripheral" areas of supposed Mixteca-Puebla influence, such as West Mexico (Lister

1955:120f.), Nicoya (Lothrop 1926:plate 20), and central Veracruz (Garcia Payon 1971:536). Fine Orange is somewhat less common in the first two areas (Smith 1958), though it has been found at the site of La Cueva in Chilpancingo, Guerrero (Schmidt 1977:63).

Both Plumbate and Fine Orange occur in two distinctive pyriform vessel forms, one with a pedestal base (Figure 2a) and the other (Figure 2b) tripod supports (Shepard 1948:figures 1, 5; Smith 1958:figure 3; a classification of pyriform shape variants is found in Smith 1957:136f., 149). When these two forms occur in other ceramic wares, their distribution parallels that of Plumbate and Fine Orange. They are both found in southern and coastal Mesoamerica; i.e. in West Mexico (*a*: Weitlaner 1948:82; *b*: Kelly 1945:plate 4; Sauer and Brand 1932:32; Ekholm 1942:figures 5, 7, 10; Sweetman 1974:77-79), Nicoya (*a*: Lothrop 1926:plates 16, 25, 26, 42, p. 110; *b*: Lothrop 1926:14-16), and Central Veracruz (*a*: Nuttall 1910:plates 8, 11; *b*: *ibid.*:plate 13); however, these forms are rare in central Mexico. Form *a* originated in Late Classic Maya ceramics (Tepeu 3 at Uaxactun—Smith 1955:figures 3h, 3j, 42b), while form *b* is generally acknowledged to have a Central American origin because of its prevalence there (Ekholm 1942:62 calls it "definitely a Central American trait"; see also Thompson 1939:233; Sweetman 1974:78f.; and Spinden's comments in Weitlaner 1948:84). The Cholula ceramic assemblage includes several examples of these forms in the local monochrome tradition (Noguera 1954:72, 74), with a few pieces in the Cholultecan polychrome style (von Winning 1968:figure 347); they also occur at the site as Gulf Coast imports (Noguera 1954:211). These two forms are virtually unknown among the local Postclassic ceramics of other central Mexican sites, and their occurrence at Cholula in all likelihood derives from Gulf Coast contacts of a limited nature. The distributional data presented here suggest that West Mexico, Nicoya and central Veracruz were linked together by a network of long-distance trade through southern and coastal Mesoamerica. While some of this trade reached central Mexico (Litvak 1972), ties were much stronger *within* the "peripheral" regions of Mesoamerica than *between* these areas and the central highlands. As further support for this proposition, two phenomena may be cited: Tula's limited role in long-distance trade and direct sea contact between Nicoya and West Mexico.

1. *The Toltec Capital and Long-Distance Trade.* The Early and Middle Postclassic periods under consideration cover the time in which the Toltec empire flourished in central Mexico. This empire was much smaller in geographical extension and much poorer in terms of control of resources and energy harnessed than either the earlier Teotihuacan or the late Aztec empires (Davies

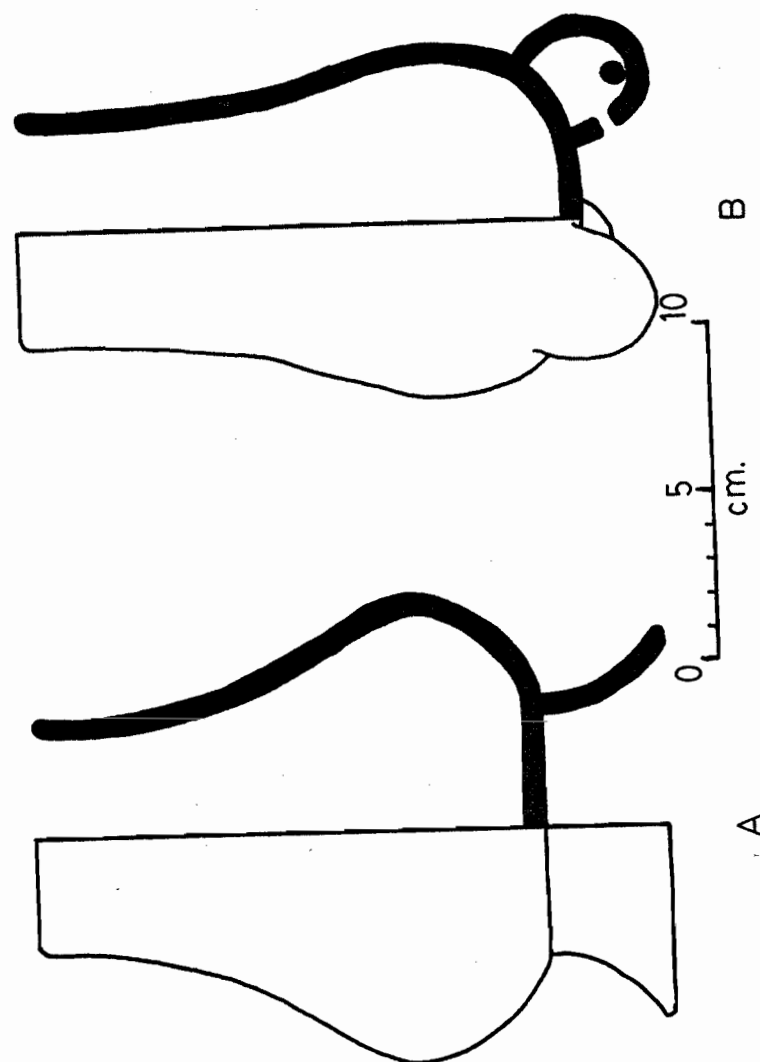


Fig. 2. Pyriform vessels of the Early and Middle Postclassic periods.

1977:227-345). In the matter of long-distance trade, the contrast is great; Davies puts it as follows:

It is hard to escape the conclusion that the Toltecs, while undoubtedly traders like nearly all Mesoamericans, were not at the very hub of the over-all commercial network of their time, as was Teotihuacan and later Tenochtitlan, but operated rather on the periphery. Not only did Fine Orange never reach Tollan (though Acosta 1976:156 reports a single piece found near Tula), but one feels that where Plumbate is concerned, the city stood somewhat at the end of the line and did not constitute a focal point of distribution (Davies 1977:283).

The recovery of a small cache of foreign polychrome vessels at Tula has been cited in support of a larger role for Tula in long-distance trade (Diehl, Lomas and Wynn 1974:184); however, the interpretation of these vessels as Nicoya polychromes (*ibid.*) has been questioned by Frederick Lange (personal communication). In any case, the evidence for long-distance trade at Tula is certainly far poorer than that for either Teotihuacan or Aztec Tenochtitlan.

2. *The Nicoya-West Mexico Connection.* During the period of A.D. 800-1100, both the Nicoya and West Mexican polychrome styles contain the feathered serpent, *xicalcolihqui*, sunburst, and other symbols of the Postclassic Religious Style. The standard interpretation is that these resemblances derive from a common source: "Mixteca-Puebla influences" from central Mexico (e.g. von Winning 1977; 1968:345). However, as mentioned above, the designs on the Chametla Late I and Culiacan Early I polychromes resemble Nicoya Middle Polychrome designs far more than they resemble anything found in the Mixteca-Puebla region. These similarities are primarily found in the horizontal bands of geometric decoration circling the ceramic vessels (see Kelly 1945:figures 19-27; Meighan 1971:figures 7, 8; Lothrop 1926:plates 13, 50, 60, 81; figures 49, 80).

Sweetman (1974:76ff.) illustrates a distinctive form of animal effigy jar which represents another similarity between West Mexican and Nicoya ceramics that cannot be derived from central Mexico. Examples from southern Sinaloa (*ibid.*:figures 5a, 5b) resemble effigy jars common in the Middle Polychrome period at Nicoya (e.g. Lothrop 1926:116-123); other similar vessels occur in Plumbate ware (Shepard 1948:22-28). Sweetman goes on to state that

(Betty) Bell (personal communication) thinks that there may be some elements in the Amapa style that suggest possible contact with Costa Rica (Sweetman 1974:78).

Spinden (1948) also suggests contacts between Nicoya and West Mexico, though his proposed mechanism (migration northward

as a "counter current" to southward Toltec migrations) is probably incorrect.

A direct link by sea between the Nicoya area and West Mexico is a likely explanation to account for these and other shared traits. Pacific coastal sea voyaging and trade off northwest South America, Central America, and West Mexico was common and highly-developed at the time of the Spanish conquest (Edwards 1965; Marcos 1977/78), and growing evidence points to a great time depth for this pattern (Paulsen 1976; Smith 1977/78; Marcos 1977/78). This sea trade was surely the mechanism by which such South American traits as deep-shaft tombs (Smith 1977/78) and metallurgy (Mountjoy 1969) were introduced into West Mexico, and would provide the means for transmission of stylistic and other traits between the ceramics of West Mexico and those from points further south without invoking poorly-defined "waves of influence" from central Mexico. A more detailed search of the literature would undoubtedly turn up many further examples of trade and contact within southern and coastal Mesoamerica that did not involve central Mexico (5).

If the terms "nuclear" and "non-nuclear" are used to characterize the spatial configurations of long-distance trade networks, the former applies to the Classic period and the latter to the Early and Middle Postclassic periods. The commercial, political, and cultural pre-eminence of Teotihuacan during its height made it the center of a nuclear long-distance trading system that covered most of Mesoamerica. In contrast, the greater part of Early and Middle Postclassic trade followed coastal and "peripheral" routes; there was no observable nucleus controlling trade from a central location.

D. The Postclassic Religious Style and Postclassic Mesoamerican Religion

Gordon Willey (1973:158) uses the phrase "ideological-iconographic unity" to characterize the phenomenon we call the Postclassic Religious Style. He states,

What this unity is, as Nicholson has told us, is a grand Mesoamerican synthesis that was effected in the Postclassic period and resulted in a new multinational culture that archaeologists have come to recognize under the name of Mixteca-Puebla. It . . . brought back together all of the old strands of Olmec iconography and belief after the long era of late Preclassic and Classic regionalism (Willey 1973:158-59).

Instead of a "culture", most authorities would call this emergent phenomenon a *religion* which brought a measure of unity to many diverse political/cultural/linguistic groups. Lothrop (1926) was perhaps one of the first authorities to note the emergence of a single Mesoamerican religion during the Postclassic

period when he stated,

In distinguishing what is "Mexican" in the art of Nicaragua and Costa Rica we are confronted with a serious difficulty arising from the fact that the fundamental esthetic and religious symbolism of most Mexican tribes rests on the same basis as that of the Maya (Lothrop 1926:398)

This theme of the existence of a single pan-Mesoamerican religion during Postclassic times has been treated more recently by Caso (1971) and Ochoa (1979:158), among others. Caso (1971) examines four aspects of Mesoamerican religion: fundamental cosmological principles; attributes of gods; ritual and the calendar; and the organization and attributes of the priesthood. He concludes that the developmental trajectory of Mesoamerican civilization through the centuries from the Formative period to the Spanish conquest involved an increasing homogenization of religion. By the sixteenth century, a "religious unity" was reached, though geographical variants existed, which Caso compares to sects (*ibid.*:199). While the greatest support for this hypothesis of religious unity comes from Late Postclassic/Early Colonial ethnohistorical sources, archaeological evidence for a pan-Mesoamerican religion during the Early Postclassic period is provided by the Postclassic Religious Style. The standardization of the style's constituent symbols (first emphasized by Nicholson) and their widespread distribution indicate a uniformity on at least the level of religious symbolism, and probably also point to similarities among regions in such matters as cosmology and ritual, though this has yet to be demonstrated. Although it is possible to identify a number of religious symbols common to many areas during the Postclassic period, Nicholson points out (1973:92) that we have no means of determining their actual meaning or cultural significance.

The Postclassic Religious Style was transmitted across Mesoamerica through the extensive trade networks described above, as demonstrated by its association with both Plumbate and Fine Orange pottery (an association noted by both Vaillant 1940:299 and Nicholson 1960:117). There are two alternative processes which could account for the diffusion of the style: (1) the basic religious ideology and practices spread, with the style, along trade routes at this time (analogous situations may be found in the spread of early Christianity or in Patterson's 1971 interpretation of the diffusion of Chavin religion in the Andes; see also Garcia Barcena 1972 on the distribution of rain god symbolism in Formative Mesoamerica); or (2) the particular art style may have spread *within* the context of an already prevalent religion (as may have been the case for the spread of the Olmec style in Middle Formative Mesoamerica). Pasztory argues that,

Through the processes of diffusion and syncretism that occurred during the Middle Classic period, much of the religion of Mesoamerica was systematized, and this system was inherited by the peoples of the Postclassic period (Pasztory 1978:130; see also Caso 1971:915 for a similar view).

If this was the case, then the latter interpretation is probably correct; on the other hand, Willey's argument (1973:158f.—see above) would favor the former.

In his discussion of a Middle/Late Postclassic variant of the Postclassic Religious Style (Mixtec polychrome pottery), Brockington (1973:84f.) calls the constituent symbols "elite-oriented", and links their wide distribution to long-distance communication among elites. Although Brockington is dealing only with the state of Oaxaca and one variant of the overall style, his observations are probably applicable to the wider phenomenon (see also Schavelzon 1980:50). In the context of the socially stratified city-states of Postclassic Mesoamerica, local elites were almost certainly the agents in control of long-distance trade, and were probably the recipients and promoters of the new standardized religion and art style.

In conclusion, it appears that widely separated cultural groups of Postclassic Mesoamerica were linked together by a similar religious foundation which was manifested in a common religious expression, the Postclassic Religious Style. The shared symbols of this style were transmitted through the mechanism of trade and communication networks with sea trade along the coasts as a principle agent in this dispersal. Our non-nuclear model successfully accounts for the distribution of the Postclassic Religious Style by identifying the processes through which the style was communicated, and it leads to fewer conflicts in accounting for the dating of examples from different areas than does the nuclear model with its "waves of influence" mechanism.

III. THE MIXTEC CODEX STYLE

The Mixtec Codex Style is one of the most distinctive and easily recognizable art styles of prehispanic Mesoamerica. The quotation from Nicholson (1960:115) in Section I above and his subsequent list of motifs (*ibid.*) serves to define the style. It should be emphasized that this is a *narrative* art style, consisting of what Proskouriakoff (1968a:12) calls "pictorial representations" as opposed to the isolated "thematic motifs" (*ibid.*) which are the hallmark of the Postclassic Religious Style. The subject matter of the Mixtec Codex Style involves human and divine figures engaged in various secular and ceremonial activities. The figures are not depicted in three-dimensional space, but rather are flat and arranged in horizontal bands. Robertson (1970a) calls

this format "register space . . . a long, low, layered surface on which the figures are painted" (*ibid.*:80; see also Robertson 1970b:302). This is most noticeable in the Mixtec Codex Style murals and ceramic vessels, but it is also evident in many of the codices. Each register is filled in by the figures and by day and year glyphs, buildings, vegetation, animals, and various artifacts in what Robertson (*ibid.*) calls a *horror vacui*: the registers and their combination into large fields look cluttered and busy. This art style has been called the "international style" by Robertson (1970a); it is a Late Postclassic manifestation centered in the Mixteca-Puebla area. Because it developed out of the already existing Postclassic Religious Style and utilized many of its symbols in a new fashion, the two styles have often been confused and lumped together under the label "Mixteca-Puebla style".

A. The Codices

As our name for this style indicates, the most prominent examples are found in the Mixtec codices or manuscripts. These can be divided into two main categories: the *ritual* codices, known as the Borgia group—Codices Borgia, Laud, Fejervary-Mayer, Cospi, Vaticanus B, Mexican Manuscript no. 20 of the Bibliotheque Nationale in Paris, and the Porfirio Diaz reverse—and the *history or geneological* manuscripts—Codices Vienna, Nuttall, Selden, Bodley and others (Nicholson 1966; Robertson 1970b). The history codices, which show the geneologies and exploits of the Mixtec ruling class (e.g. Caso, 1960, 1964), almost certainly originated in the highland area of northern Oaxaca known as the Mixteca (historically the home of the Mixtec-speaking peoples). However, the provenience of manuscripts of the Borgia group has been a topic of some debate. The most likely places of origin are: (1) *the Mixteca*, because of their stylistic similarity with the history codices and with Mixtec polychrome ceramics (Robertson 1970b); (2) *the Puebla-Tlaxcala region* and in particular the city of Cholula (Nicholson 1960, 1961, 1966), because of their stylistic similarity with Cholulteca polychrome ceramics and the religious pre-eminence of Cholula during the Late Postclassic period; and (3) *the Tehuacan Valley*, because ceramic modes and architectural details illustrated in the codices purportedly can be traced only to this region (Chadwick and MacNeish 1969; Chadwick 1971:240ff.). However, Gorenstein (1973:64f.) shows that many of the ceramic modes involved are not limited to the Tehuacan Valley, but rather occur over most of southern Puebla. These three areas, together with the Valley of Oaxaca, comprise the Mixteca-Puebla geographical area as commonly defined (see Nicholson 1961).

It is generally thought that the Mixtec codices were painted in the final two hundred years before the Spanish conquest (Kubler

1962:90; Adams 1977:285). The geneologies in the Codex Nuttall run to about A.D. 1330 (Miller 1975:xvi), so a late date for at least some of the history codices is in order (see also Paddock 1970:201ff.). Chadwick and MacNeish (1967:123) argue that the Codex Borgia dates to around A.D. 1100-1300, based on comparisons with the Tehuacan ceramic sequence (MacNeish, Peterson and Flannery 1970). While stylistic differences between the various rituals and history codices are discussed in the literature (Nicholson 1966; Robertson 1970b), there is no doubt that all of these manuscripts form a single recognizable group. (See Troike 1978 for recent advances in the study of the Mixtec codices.)

B. "Tipo Codice" Ceramics

A style of painting on some late polychrome ceramics from both the *Mixteca Alta* (Caso, Bernal and Acosta 1967:471; plates 13, 17, 18, 20-23, 25, 27; Paddock 1970:plates 18-20, 26, 27, 29-32) and *Cholula* (Noguera 1954:69, 227; von Winning 1968:plates 341, 345; Covarrubias 1957:facing 196) is so similar to the style of the Mixtec codices that such ceramics have been characterized as "tipo codice" or codex type (Muller 1970:141; Robertson 1970b:301; Chadwick 1971). Dating of these ceramics is a problem for two reasons: first, they are rarely distinguished from other elaborate late polychrome pottery in the published literature; and second, the dating of the Cholulteca polychrome ceramics in general is a current topic of debate (see discussion in Section IV below). The Mixtec polychrome examples date to the final centuries before the Spanish conquest, probably starting around A.D. 1350 (Spores 1972:48; Bernal 1970:365). Three examples of "tipo codice" polychrome vessels from Amapa, Nayarit have recently been published by von Winning (1977); these are very similar in style and content to the other examples.

C. Codex-Style Murals

Murals painted in the style of the Mixtec codices are found from Mitla (Oaxaca), Tizatlan (Tlaxcala), the east coast of Yucatan, and Tamuin (San Luis Potosi), with possible examples at Isla de Sacrificios (Veracruz). The *Mitla* murals are described by Seler (1904, 1960); they are generally attributed to the Monte Alban V phase (A.D. 1000-1525—see Caso 1965:869f.), and Kubler (1962:98) suggests that they probably date to the same horizon as the Aztec presence in the Valley of Oaxaca (*i.e.* post-1450). These murals are very similar in style and content to the ritual codices, and Seler (1904) analyzes them in the same manner in which he analyzes the Codex Borgia (1963). The *Tizatlan* murals are paintings on the plaster surfaces of an altar which were uncovered and described by Caso (1927). They are representations of humans and deities nearly identical to those in the Borgia group of Mixtec codices, and date to the Late Postclassic period (see García Moll

1976:211).

Three sites on the Yucatan peninsula have murals in the style of the Mixtec codices. The *Santa Rita* (Belize) Murals were first described by Gann (1900; see also Kubler 1962:204; Thompson 1966:164; Robertson 1970:84; Miller 1977:110) and are not dated other than through comparison with the murals at Tulum or with the Mixtec codices. The *Tulum* murals, first described by Lothrop (1924), are the object of recent study by Robertson (1970a) and Miller (1972a, 1972b, 1973, 1977). Miller dates them to his Postclassic Phase 3 (1977:129), which he estimates to begin after 1450 (*ibid.*:139). Recently, murals very similar to the Tulum examples have been reported at the site of *Xelha*, Quintana Roo (Farriss, Miller and Chase 1975). All three sets of murals share iconographic motifs as well as stylistic conventions with the codices and the Mitla murals (see especially Miller 1972a), as well as having certain Maya traits such as deity masks and glyph-like elements. Robertson (1970a:84) thinks that the *Santa Rita* murals are earlier than those at Tulum, and Kubler (1972:205) suggests that there are more Maya traits in the Tulum murals than in the *Santa Rita* examples. In his study of the Tulum murals, Lothrop (1924:50) notes that along the east coast of Yucatan, "frescoes and painted walls were observed at several cities", but he did not copy these.

The Huastec mural at *Tamuin* (DuSolier 1946; Ochoa 1979:77; Covarrubias 1957:202) might be considered another example of the Mixtec Codex Style. This mural is much "busier" in appearance than those discussed above, with more elaborate figures and almost no vacant space; however, the basic layout and stylistic conventions are the same. The *Tamuin* murals probably date to the Late Postclassic period, but this remains to be clearly demonstrated (DuSolier 1946). In addition, some of the intricate Huastec carved shell ornaments (Beyer 1933; Ochoa 1979:43-47) resemble the Mixtec Codex Style; these can be only generally dated to the Postclassic period (Ochoa 1979:45). Fragments of murals that may be in the Codex Style are reported from *Isla de Sacrificios*, Veracruz (Nuttall 1910:plate 5), where in particular a preserved fragment of a feathered serpent resembles depictions in the codices.

D. Discussion

While there are certainly many observable differences among the various Mixtec codices, polychrome ceramics, and murals mentioned above, their basic similarity in both style and content warrants their placement within a single style—the Mixtec Codex Style. Although its possible dates range from A.D. 1100 to 1525, all of the firmly-dated examples fall in the latter half of this range—the history codices (post-1350), the "tipo codice" Mixtec

polychrome ceramics (post-1350), and the Tulum murals (post-1450). We hesitate to call the Mixtec Codex Style a horizon style, however, because of its relatively limited spatial distribution. Outside of the Mixteca-Puebla area, there are only isolated examples from Yucatan, Veracruz and Nayarit.

At least some of the long-distance trading systems discussed above for the Early and Middle Postclassic periods continued into the Late Postclassic period. Coastal trade around the Yucatan peninsula is particularly well-documented (*e.g.* Thompson 1970:chapter 1; Sabloff and Rathje 1975), and it is generally accepted that this trade provided the mechanism for transmission of the Mixtec Codex Style to Yucatan (Miller 1977:100; Thompson 1970:46, 78; Adams 1977:285). Consideration of the details of this process (did the Mixtec codex-painters travel to Yucatan; were the codices themselves traded; etc.) is left to others (see Robertson 1970a: 88; Miller 1977:100). The important points for our discussion here are that: (1) the Mixtec Codex Style is a *Late* Postclassic phenomenon, thus largely postdating the height of the Postclassic Religious Style; and (2) its spatial distribution is consistent with a nuclear model of cultural dynamics. By Late Postclassic times, vigorous religious and artistic traditions existed in both Cholula and the Mixteca, and it may be presumed that these were the areas in which the Mixtec Codex Style developed out of the older Postclassic Religious Style.

IV. THE MIXTECA-PUEBLA REGIONAL CERAMIC SPHERE

The Mixteca-Puebla Regional Ceramic Sphere is not a pictorial art style like the other two phenomena described in this paper. Rather, it is a broad collection of ceramic modes and types, including decorative stylistic elements, that encompasses most of the Middle and Late Postclassic ceramic assemblages found in the Mixteca-Puebla area. We include a discussion of this entity here because these ceramics are often said to be part of the "Mixteca-Puebla style" (*e.g.* Noguera 1975:166ff.; Chadwick 1971; Schavelzon 1980), and there are important links between the component ceramics and both the Postclassic Religious Style and the Mixtec Codex Style. The ceramic sphere dates to the Middle and Late Postclassic periods, and includes the Late Venta Salada phase in the Tehuacan Valley, the Monte Alban V phase of the Valley of Oaxaca, the Cholulteca II and III phases at Cholula, and the Tlaxcala phase of the Puebla-Tlaxcala Valley (see Appendix II). The authors of the Tehuacan Valley Project ceramic report discuss the relationships between ceramics of these areas as follows:

The immediate neighbors to the north and to the south, and west of the Tehuacan Valley (*i.e.* the Mixteca-Puebla area) are not only

linked to it by trade sherds, overlapping types, and period styles, but all four regions are so closely related ceramically that they could well be considered local variations of a single large cultural subarea of central Mesoamerica (MacNeish, Peterson and Flannery 1970:236).

The lack of fine chronological control in the Mixteca-Puebla area would only permit dating this ceramic sphere to *ca.* A.D. 1100/1200 to 1520 (see Appendix II; the mean duration of Postclassic ceramic phases in this area is 350 years, compared to West Mexico, where the figure is just under 200 years). However, a number of constituent modes—black-on-orange decoration; stamped bowl bases; Cholula-style polychromes—extend northward into Eastern Morelos and the Southeastern Basin of Mexico where they may be dated with greater precision. In Eastern Morelos, these traits are present in the Tetla Complex at Tetla and other sites, dating to *ca.* A.D. 1150-1350 (Norr n.d.; Smith 1981), while in the Southeastern Valley of Mexico they appear in the contemporaneous Early Aztec period (Sanders, Parsons and Santley 1979:467-471; Sejourne 1970).

Because the Cholula polychrome ceramics are part of the Mixteca-Puebla Regional Ceramic Sphere and also relate to the other two styles discussed in this paper, some space is devoted here to problems of their chronological placement. Noguera (1954:259; 1979:169) places the distinctive Cholula *laca* polychromes (polychrome painting with a white background painted over an orange slip) as early as Cholulteca I (A.D. 800-900), with various polychrome types continuing until the Spanish conquest. However, in her reanalysis of the Cholula ceramic sequence, Muller (1970, 1978) asserts that the polychromes do not appear until the Cholulteca III phase, dating to post-1325. Castillo Tejero (1972:119; 1975:8), Garcia Cook (1974:15-17; 1976:88), and Chadwick (1971:243f.) follow Noguera, while Davies (1977:115, 329) and Dumond and Muller (1972:1210) agree with Muller's placement. Polychrome ceramics in the Puebla-Tlaxcala Valley are said to date to the Early Postclassic period (middle Texcalac phase), although no supporting data are provided (Garcia Cook 1974:15-17; 1976:88); furthermore, no illustrations are given and the relationship of these polychromes to the Cholula examples is unclear.

Since none of the above authors cite stratigraphic or other evidence in support of their claims, we must turn to areas outside of the Cholula region in order to more accurately date the Cholula polychrome ceramics. One sherd of Cholula polychrome is reported from an Early Venta Salada context in the Tehuacan Valley (MacNeish *et al.* 1970:209), while 209 sherds were recovered in Late Venta Salada levels (*ibid.*:221). This would indicate a Late Venta Salada dating for the Cholula imports, since a

single sherd is not sufficient to establish a firm association. As mentioned above, Cholula polychrome ceramics, as part of the Mixteca-Puebla Regional Ceramic Sphere, are firmly dated to a time level of *ca.* A.D. 1150-1350 in both the southern Basin of Mexico and Eastern Morelos. In addition, Cholula polychrome sherds are found associated with the Teopanzolco Ceramic Complex of the Cuernavaca area of Western Morelos, dating to the same period (Smith 1981).

In the absence of (published) stratigraphic or other data for the Cholula area, a twelfth century origin date is assumed for the Cholula polychromes, based on stratigraphic and radiometric evidence from Tehuacan, the Basin of Mexico, and Morelos. These polychromes continue through the Late Postclassic period until the Spanish conquest, though studies of stylistic development within the overall tradition are precluded by the scanty nature of the published evidence. As stated above, the elaborately decorated "tipo codice" variants of Cholula polychrome have not been distinguished in the literature, so their precise chronological placement is uncertain.

In summary, the Mixteca-Puebla Regional Ceramic Sphere crystallized during the Middle Postclassic period and probably continued on through Late Postclassic times, though our present lack of chronological control leaves this in some doubt. Many of the constituent decorated wares portray the symbols of the Postclassic Religious Style, while a small and probably late subset of these wares ("tipo codice") reflect the Mixtec Codex Style. It would therefore seem likely that these Mixteca-Puebla Regional Ceramic Sphere polychromes may illuminate the evolution of the Late Postclassic Mixtec Codex Style out of the earlier Postclassic Religious Style. Unfortunately, this hypothesis cannot be evaluated until the Postclassic ceramic sequences of the Mixteca-Puebla area are refined considerably and published in far greater detail.

V. CONCLUSIONS

We have tried to show that common usage of the Mixteca-Puebla concept confuses three separate phenomena which we call the Postclassic Religious Style, the Mixtec Codex Style, and the Mixteca-Puebla Regional Ceramic Sphere. It is an understanding of the first phenomenon, the Postclassic Religious Style, that has been adversely affected by the confusion inherent in the old "Mixteca-Puebla style". A nuclear, "waves of influence" model (which presupposes a core area for the development of the style in the central Mexican highlands and diffusion out of this core to other areas) is almost universally embraced in the literature to explain the widespread distribution of the style during the Early and Middle Postclassic periods (*e.g.* Nicholson 1960, 1973; Vail-

lant 1940:300; Ekholm 1942:126ff.; Medellin Zenil 1960:148ff.; von Winning 1977; Adams 1977:285; Meighan 1974:1259; Stone 1972:163ff.; Schavelzon 1980:21). However, there is little evidence to support this model and indeed much evidence that is incompatible with it. Instead, we propose a non-nuclear interpretation which accounts for the distribution of the Postclassic Religious Style through extensive trade and communication networks within the context of an increasingly standardized pan-Mesoamerican religion.

The continued adherence to the "waves of influence" model is largely due to confusion of symbols used in the Postclassic Religious Style throughout the whole Postclassic epoch with the strictly Late Postclassic Mixtec Codex Style. Most studies of the codex style (e.g. Miller 1972a, 1972b, 1977; Robertson 1970a, 1970b) have not suffered from this confusion, and the elements of this particular style and its distribution are relatively well understood. The Mixtec Codex Style was a local development in the Mixteca-Puebla area out of the already extant and widespread Postclassic Religious Style; in fact, the codex style adopted many of the standardized symbols of the latter. The currently espoused nuclear model *does* fit the development and diffusion of the codex style; an ethnically diverse core area (the Mixteca-Puebla area) with many shared cultural traits (e.g. the Mixteca-Puebla Regional Ceramic Sphere) produced a vigorous and elaborate art style, a few examples of which reached more distant areas of Late Postclassic Mesoamerica. If the Postclassic Religious Style and the Mixtec Codex Style are not explicitly separated, but are lumped together as in Nicholson's definition of the "Mixteca-Puebla style", it is easy to apply this nuclear model to the former, thus obscuring the more complex processes involved.

Another reason for the persistence of the "waves of influence" model is an implicit cultural-geographical bias among Mesoamericanists in favor of highland central Mexico. This bias leads archaeologists to view the central highlands as a source of innovations and influence more frequently than is warranted. Meighan exemplifies this bias when he states, "the cultural power was clearly in central Mexico" (1974:1259), without explaining the basis for this conclusion; we have shown that this statement is simply not true for the Early Postclassic period. Another example of the central Mexican bias concerns the painted designs on Aztec I black-on-orange pottery from Culhuacan in the Basin of Mexico (see Sejourne 1970:figures 50-77; Peterson 1957). These designs clearly fall within the Postclassic Religious Style, but are more sloppily executed and date several centuries later than many other examples of the style. Yet Sejourne attributes the initial creation of the symbols used (*xicalco-liuhqui*, feathered serpent, etc.) to the artists of Culhuacan,

because this was presumably the earliest Postclassic site in the Basin of Mexico (Sejourne 1970:50-51)! Statements of this sort are typical of many archaeologists working in the central highlands who fail to look beyond this area for the development of new ideas and forms of expression. Claims such as Meighan's and Sejourne's must be attributed more to a *a priori* highland bias than to a careful consideration of the data.

The claim that the Mixteca-Puebla area was pivotal to the development of standardized religious symbols in Postclassic Mesoamerica is without support; in fact the contribution of the Mixteca-Puebla area to this development occurred rather late in the period. We therefore suggest that the term "Mixteca-Puebla" be dropped in reference to these symbols; indeed the use of this name contributes to the propagation of the "waves of influence" model. Postclassic Religious Style is a neutral label, without geographical bias, which may be applied to the phenomenon in question (Mixtec Codex Style and Mixteca-Puebla Regional Ceramic Sphere are more explicit terms which may be used to refer to the other phenomena that have been lumped under the old "Mixteca-Puebla style"). Once the "waves of influence" model with its nuclear, culture-area framework and highland bias is abandoned, it becomes obvious that a non-nuclear model provides a better fit for the distribution data of the Postclassic Religious Style. Instead of invoking vague "influences" from a nebulous center to account for the style's distribution, the new perspective relates the development of the style to ongoing processes of trade, communication and religious interpretation that characterized much of Mesoamerica during the Postclassic period.

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NOTES

1. It should be pointed out that Friedel (1979:50f.) uses the term "region" to refer to an area larger than that usually encompassed by geographers' and anthropologists' usage of the term. We would substitute "macro-region" where he uses "region".

2. In addition to the interaction sphere model, other explicitly non-nuclear models of cultural development include Price's (1977) "cluster-interaction" model and Wallerstein's (1974) "world-system" model. Neither of these appears to

apply to the Postclassic Religious Style, because they do not give sufficient weight to the religious variables involved in the development and spread of the style. Furthermore, Price's formulation is not of sufficient geographical extent to deal with the phenomenon at hand, while Wallerstein's model may call for too large a geographical area. Nevertheless, both models are very useful in other contexts.

3. Isolated cases of the various symbols occur much earlier in various parts of Mesoamerica. For example, a *xicalcolihui* is incised in a Monte Alban II bowl (200 B.C.-A.D. 200) housed in the Museo Nacional de Antropología in Mexico City (see Bernal 1969:plate 80). Another example is found in the Early Tlamimilolpa phase (A.D. 200-300) at Teotihuacan (Muller 1978b:figure 23). However, the full complement of standardized symbols and their characteristic arrangement on ceramic vessels does not emerge until the Early Postclassic period.

4. Vaillant (1940:300) includes Naco, Honduras in his list of sites exhibiting Mixteca-Puebla traits. However, we do not find any traits from that site that resemble either the Postclassic Religious Style or the Mixtec Codex Style (see Strong, Kidder and Paul 1938; Glass 1966).

5. For example, Lothrop (1926:398) suggested that the Nicoya Middle Polychrome style had affinities with Veracruz. Bruhns (1979) recently pointed out that the Terminal Classic/Early Postclassic ceramics of Cihuatán, El Salvador are more closely related to contemporaneous ceramics from Veracruz than to examples from closer areas of Guatemala and Honduras. Schmidt (1977:69) argues that the Maya traits found at Xochicalco and nearby areas of Guerrero were brought across the Isthmus of Tehuantepec and up the Pacific Coast, rather than through the Mixteca-Puebla area; the latter route is the shorter one. Many more such examples could probably be produced with further research.

REFERENCES CITED

- Acosta, Jorge R. 1976. Los Toltecas. In Chán, Román Piña (ed.): *Los Señorios y Estados Militaristas*, pp. 137-158. Mexico City: Instituto Nacional de Antropología e Historia.
- Adams, Richard E.W. 1977. *Prehistoric Mesoamerica*. Boston: Little, Brown.
- Andrews, Anthony P. 1978. Puertos Costeros del Postclásico Temprano en el Norte de Yucatán. *Estudios de Cultura Maya* 11:75-94.
- Ball, Joseph W. 1978. *Archaeological Pottery of the Yucatan-Campeche Coast*. Middle American Research Institute, Publication 46.
- Baudez, Claude F. 1970. *Central America*. Geneva: Nagel.
- Baudez, Claude F., and Michael D. Coe. 1962. Archaeological Sequences in Northwestern Costa Rica. XXXIV International Congress of Americanists (Vienna, 1960):366-373.
- Bell, Betty. 1971. Archaeology of Nayarit, Jalisco, and Colima. In Ekholm, Gordon F., and Ignacio Bernal (eds.): *Archaeology of Northern Mesoamerica*, Pt. 1, pp. 694-753. (*Handbook of Middle American Indians*, Vol. II.) Austin: University of Texas Press.
1974. (ed.) *The Archaeology of West Mexico*. Ajijic, Jalisco: Sociedad de Estudios Avanzados del Occidente de México.
- Bernal, Ignacio. 1969. *The Olmec World*. (Doris Heyden and Fernando Horcasitas, trans.). Berkeley: University of California Press.
1970. The Mixtecs in the Archaeology of Oaxaca. In Paddock, John (ed.): *Ancient Oaxaca*, pp. 345-366. Stanford: Stanford University Press.

- Beyer, Hermann. 1933. Shell Ornament Sets from the Huasteca. *Middle American Research Institute Publication* 5: 153-216.
- Brockington, Donald L. 1973. *Archaeological Investigations at Miahuatlan, Oaxaca*. Vanderbilt University Publications in Anthropology, No. 7.
- Brown, James A. 1976. The Southern Cult Reconsidered. *Midcontinental Journal of Archaeology* 1(2):115-136.
- Bruhns, Karen O. 1979. Trade and Migration in Postclassic El Salvador. Paper presented at the XLIII International Congress of Americanists (Vancouver).
- Carmack, Robert M. 1968. Toltec Influence on the Post-classic Culture History of Highland Guatemala. *Middle American Research Institute Publication* 26: 49-92.
- Carmack, Robert M., and Lynn Larmer. 1971. Quichean Art: A Mixteca-Puebla Variant. *University of Northern Colorado, Museum of Anthropology, Miscellaneous Series*, No. 23.
- Caso, Alfonso. 1927. Las Ruinas de Tizatlan, Tlaxcala. *Revista Mexicana de Estudios Antropológicos* 1:139-172.
1960. Valor Histórico de los Códices Mixtecos. *Cuadernos Americanos* 19(2):139-147.
1964. *Interpretación del Códice Selden 3135 (A.2)*. Mexico City: Sociedad Mexicana de Antropología.
1965. Sculpture and Mural Painting in Oaxaca. In Willey, Gordon (ed.): *Archaeology of Southern Mesoamerica*, Pt. 2, pp. 849-870. (*Handbook of Middle American Indians*, Vol. III.) Austin: University of Texas Press.
1971. Religión o Religiones Mesoamericanas? XXXVIII International Congress of Americanists (Stuttgart, 1968) III:189-200.
- Caso, Alfonso and Ignacio Bernal. 1965. Ceramics of Oaxaca. In Willey, Gordon (ed.): *Archaeology of Southern Mesoamerica*, Pt. 2, pp. 871-895. (*Handbook of Middle American Indians*, Vol. III.) Austin: University of Texas Press.
- Caso, Alfonso, Ignacio Bernal, and Jorge R. Acosta. 1967. *La Cerámica de Monte Alban*. Instituto Nacional de Antropología e Historia, Memorias, 13.
- Castillo Tejero, Noemí. 1972. La Cerámica Pintada en Mesoamérica como Marcador de Horizonte. XL International Congress of Americanists (Rome, 1972) I:117-122.
1975. La Llamada "Cerámica Policroma Mixteca" No es un Producto Mixteco. *Comunicaciones* 11:7-10.
- Chadwick, Robert. 1971. Postclassic Pottery of the Central Valleys. In Ekholm, Gordon F., and Ignacio Bernal (eds.): *Archaeology of Northern Mesoamerica*, Pt. 1, pp. 228-257. (*Handbook of Middle American Indians*, Vol. X.) Austin: University of Texas Press.
- Chadwick, Robert, and Richard S. MacNeish. 1969. Codex Borgia and the Venta Salada Phase. In Byers, Douglas S. (ed.): *The Prehistory of the Tehuacan Valley*, Vol. I (Environment and Subsistence), pp. 114-131. Austin: University of Texas Press.

- Codex Nuttall. 1975. *Codex Nuttall*. (Zelia Nuttall, ed. Introduction by Arthur G. Miller.) New York: Dover Press.
- Coe, Michael D. 1962a. Costa Rican Archaeology and Mesoamerica. *Southwestern Journal of Anthropology* 18:170-183.
- 1962b. Preliminary Report of Archaeological Investigations in Coastal Guancaste, Costa Rica. XXXIX *International Congress of Americanists* (Vienna, 1960): 358-365.
- Covarrubias, Miguel. 1957. *Indian Art of Mexico and Central America*. New York: Alfred A. Knopf.
- Davies, Nigel. 1977. *The Toltecs Until the Fall of Tula*. Norman: University of Oklahoma Press.
- Diehl, Richard A., R. Lomas, and J.T. Wynn. 1974. Toltec Trade with Central America: New Light and Evidence. *Archaeology* 27:182-187.
- Drucker, Philip. 1943a. *Ceramic Stratigraphy at Cerro de las Mesas, Veracruz, Mexico*. Smithsonian Institution, Bureau of American Ethnology, Bulletin 141.
- 1943b. *Ceramic Sequence at Tres Zapotes, Veracruz, Mexico*. Smithsonian Institution, Bureau of American Ethnology, Bulletin 140.
- Dumond, Don E., and Florencia Muller. 1972. Classic to Postclassic in Highland Central Mexico. *Science* 175:1208-1215.
- DuSolier, Wilfrido. 1946. Primer Fresco Mural Huasteca. *Cuadernos Americanos* 30:151-159.
- Edward, Clinton R. 1965. Aboriginal Watercraft on the Pacific Coast of South America. *Ibero-Americana* 47.
- Ekholm, Gordon F. 1942. Excavations at Guasave, Sinaloa, Mexico. *American Museum of Natural History, Anthropological Papers* 38:23-139.
1944. Excavations at Tampico and Panuco in the Huasteca, Mexico. *American Museum of Natural History, Anthropological Papers* 38:319-509.
- Epstein, Jeremiah F. 1959. Dating the Ulua Polychrome Complex. *American Antiquity* 25:125-129.
- Farriss, Nancy M., Arthur G. Miller, and Arlen F. Chase. 1975. Lata Maya Mural Paintings from Quintana Roo, Mexico. *Journal of Field Archaeology* II(1/2):5-10.
- Fox, John W. 1980. Lowland to Highland Mexicanization Processes in Southern Mesoamerica. *American Antiquity* 45(1):43-54.
- Friedel, David A. 1979. Culture Areas and Interaction Spheres: Contrasting Approaches to the Emergence of Civilization in the Maya Lowlands. *American Antiquity* 44(1):36-54.
- Gann, Thomas W.F. 1900. Mounds in Northern Honduras. *Smithsonian Institution, Bureau of American Ethnology Annual Report* 19(2):655-692.
- García Bárcena, Joaquín. 1972. Origen y Desarrollo de Algunas Aspectos de las Representaciones de los Dioses Mesoamericanos de la Lluvia y su Relación con las Rutas de Intercambio Prehispánicas. In King, J.L., and Noemí Castillo Tejero (eds.): *Religión en Mesoamérica*, pp. 151-160. Mexico City: Sociedad Mexicana de Antropología.
- García Cook, Angel. 1974. Una Secuencia Cultural para Tlaxcala. *Comunicaciones* 10:5-22.
1976. El Desarrollo Cultural en el Norte del Valle Poblano: Inferencias. *Instituto Nacional de Antropología e Historia, Departamento de Monumentos Prehispánicos, Serie Arqueología*, No. 1.
- García Moll, Roberto. 1976. El Postclásico en Puebla-Tlaxcala. In Clifán, Román Piña (ed.): *Los Señorios y Estados Militaristas*, pp. 209-213. Mexico City: Instituto Nacional de Antropología e Historia.
- García Payón, José. 1971. Archaeology of Central Veracruz. In Ekholm, Gordon F., and Ignacio Bernal (eds.): *The Archaeology of Northern Mesoamerica*, Pt. 2, pp. 505-542. (*Handbook of Middle American Indians*, Vol. II.) Austin: University of Texas Press.
- Glass, John B. 1966. Archaeological Survey of Western Honduras. In Ekholm, Gordon F., and Gordon R. Willey (eds.): *Archaeological Frontiers and External Connections*, pp. 157-179. (*Handbook of Middle American Indians*, Vol. IV.) Austin: University of Texas Press.
- Gorenstein, Shirley. 1973. Tepexi el Viejo: A Postclassic Fortified Site in the Mixteca-Puebla Region of Mexico. *American Philosophical Society Transactions* 63(1).
- Guillemin, Jorge. 1965. *Iximche, Capital de Antiguo Reino Cakchiquel*. Guatemala City: Instituto Nacional de Antropología e Historia.
- Jimenez Moreno, Wigberto. 1970. Mesoamerica Before the Toltecs. In Paddock, John (ed.): *Ancient Oaxaca*, pp. 1-82. Stanford: Stanford University Press.
- Kelley, J. Charles, and Howard D. Winters. 1960. A Revision of the Archaeological Sequence in Sinaloa, Mexico. *American Antiquity* 25:547-561.
- Kelly, Isabel T. 1938. Excavations at Chametla, Sinaloa. *Ibero-Americana* 14.
1945. Excavations at Culiacan, Sinaloa. *Ibero-Americana* 25.
- Kirchoff, Paul. 1943. Mesoamérica: Sus Límites Geográficos, Composición Étnica y Caracteres Culturales. *Acta Americana* 1:92-107.
- Kroeber, Alfred L. 1939. *Cultural and Natural Areas of Native North America*. University of California Publications in American Archaeology and Ethnology:38.
- Kubler, George. 1962. *The Art and Architecture of Ancient America*. Baltimore: Penguin.
- Lind, Michael D. 1967. *Mixtec Polychrome Pottery: A Comparison of the Late Preconquest Polychrome Pottery from Cholula, Oaxaca, and the Chinantla*. Unpublished Masters Thesis, Department of Anthropology, University of the Americas.
- Lister, Robert H. 1949. *Excavations at Cojumatlan, Michoacan, Mexico*. University of New Mexico Publications in Anthropology:5.
1955. *The Present Status of the Archaeology of Western Mexico: A Distribution Study*. University of Colorado Studies, Series in Anthropology:5.
- Litvak King, Jaime. 1972. Las Relaciones Externas de Xochicalco: Una Evaluación de su Posible Significado. *Anales de Antropología* 9:53-76.
- Lothrop, Samuel K. 1924. *Tulum: An Archaeological Study of the East Coast of Yucatan*. Carnegie Institution of Washington, Publication 335.
1926. *Pottery of Costa Rica and Nicaragua* (2 Vols.). New York Museum of the American Indian (Heye Foundation), Contributions, Vol. 8.

1966. Archaeology of Lower Central America. In Ekholm, Gordon F., and Gordon R. Willey (eds.): *Archaeological Frontiers and External Connections*, pp. 180-208. (*Handbook of Middle American Indians*, Vol. 4.) Austin: University of Texas Press.
- MacNeish, Richard S., Frederick A. Peterson, and Kent V. Flannery. 1970. *The Prehistory of the Tehuacan Valley*, Vol. 3 (Ceramics). Austin: University of Texas Press.
- Marcos, Jorge. 1977/78. Cruising to Acapulco and Back with the Thorny Oyster Set: A Model for a Linear Exchange System. *Journal of the Steward Anthropological Society* 9(1/2):99-132.
- Meacham, William. 1977. Continuity and Local Evolution in the Neolithic of South China: A Non-nuclear Approach. *Current Anthropology* 18(3):419-440.
- Medellín Zenil, Alfonso. 1960. *Cerámicas de Totonacapan*. Xalapa: Universidad Veracruzana.
- Meighan, Clement W. 1971. Archaeology of Sinaloa. In Ekholm, Gordon F., and Ignacio Bernal (eds.): *Archaeology of Northern Mesoamerica*, Pt. 2, pp. 754-767. (*Handbook of Middle American Indians*, Vol. 11.) Austin: University of Texas Press.
1974. Prehistory of West Mexico. *Science* 184:1254-1261.
1976. *The Archaeology of Amapa, Nayarit*. Los Angeles: University of California at Los Angeles, Institute of Archaeology.
- Meighan, Clement W., and Leonardo J. Foote. 1968. *Excavations at Tizapan El Alto, Jalisco*. University of California at Los Angeles, Latin American Center, Latin American Studies, Vol. 11.
- Miller, Arthur G. 1972a. The Mural Painting in Structure 12 at Tancah and in Structure 5 at Tulum, Quintana Roo, Mexico: Implications of Their Style and Iconography. *XL International Congress of Americanists* (Rome, 1972), Vol. 1:465-471.
- 1972b. The Iconography of the Painting in the Temple of the Diving God, Tulum, Quintana Roo: A Tentative Hypothesis. In King, J.L., and Noemí Castillo Tejero (eds.): *Religión en Mesoamerica*, pp. 329-383. Mexico City: Sociedad Mexicana de Antropología.
1973. Archaeological Investigations at the Quintana Roo Mural Project: A Preliminary Report of the 1973 Season. In Graham, John (ed.): *Studies in Ancient Mesoamerica*, pp. 137-148. University of California Archaeological Research Facility, Contribution No. 18.
1975. Introduction. *The Codex Nuttall* (op. cit.): vii-xviii. New York: Dover Press.
1977. The Maya and the Sea: Trade and Cult at Tancah and Tulum, Quintana Roo, Mexico. In Benson, Elizabeth P. (ed.): *The Sea in the Pre-Columbian World*, pp. 97-140. Washington, D.C.: Dumbarton Oaks.
- Morley, Sylvanius G. 1956. *The Ancient Maya* (3rd ed., revised by George W. Brainerd). Stanford: Stanford University Press.
- Mountjoy, Joseph B. 1969. On the Origins of West Mexican Metallurgy. In Kelley, J. Charles, and Carroll Riley (eds.): *Pre-Columbian Contact within Nuclear America*, pp. 26-42. Southern Illinois University, Mesoamerican Studies No. 4.

- Muller, Florencia. 1970. La Cerámica de Cholula. In Marquina, Ignacio (ed.): *Proyecto Cholula*, pp. 129-142. Instituto Nacional de Antropología e Historia, Serie Investigaciones, No. 19.
- 1978a. *La Alfarería de Cholula*. Mexico City: Instituto Nacional de Antropología e Historia.
- 1978b. *La Cerámica de Teotihuacán*. Mexico City: Instituto Nacional de Antropología e Historia.
- Myers, Thomas P. 1978. Formative-period Interaction Spheres in the Intermediate Area: Archaeology of Central America and Adjacent South America. In Browman, David L. (ed.): *Advances in Andean Archaeology*, pp. 203-224. The Hague: Mouton.
- Navarrete, Carlos. 1973. El Sistema Prehispánico de Comunicaciones Entre Chiapas y Tabasco. *Anales de Antropología* 10:33-92.
- Nicholson, Henry B. 1960. The Mixteca-Puebla Concept in Mesoamerican Archaeology: A Re-examination. In Cordy-Collins, Alana, and Jean Stern (eds.): *Pre-Columbian Art History: Selected Readings*, pp. 113-119. Palo Alto: Peek Publications. (1977; page references are to this version.) Reprinted from: *Men and Cultures: Selected Papers of the Fifth International Congress of Anthropological and Ethnological Sciences* (Anthony F.C. Wallace, ed.). Philadelphia: University of Pennsylvania Press (1960).
1961. The Use of the Term "Mixtec" in Mesoamerican Archaeology. *American Antiquity* 26(3):431-433.
1966. The Problem of the Provenience of the Members of the "Codex Borgia Group". In Pompa y Pompa, A. (ed.): *Summa Antropológica en Homenaje a Roberto J. Weitlaner*, pp. 145-158. Mexico City: Instituto Nacional de Antropología e Historia.
1973. The Late Pre-Hispanic Central Mexican (Aztec) Iconographic System. *The Iconography of Middle American Sculpture*, pp. 72-97. New York: Metropolitan Museum of Art.
1978. Western Mesoamerica: A.D. 900-1520. In Taylor, R.E., and Clement W. Meighan (eds.): *Chronologies in New World Archaeology*, pp. 285-329. New York: Academic Press.
- Noguera, Eduardo. 1954. *La Cerámica de Cholula*. Mexico City: Editorial Guaranía.
1975. *La Cerámica Arqueológica de Mesoamérica* (2nd ed.). Mexico City: Universidad Nacional Autónoma de México.
- Norr, Lynette. n.d. The Excavation of a Postclassic House at Tetla. In Grove, David C. (ed.): *Chalcatzingo*. Urbana: University of Illinois Press (in press).
- Nuttall, Zelia. 1910. The Island of Sacrifice. *American Anthropologist* 12:257-295.
- Ochoa, Lorenzo. 1979. *Historia Prehispánica de la Huasteca*. Mexico City: Universidad Nacional Autónoma de México.
- Olivera, Mercedes. 1970. La Importancia Religiosa de Cholula. In Marquina, Ignacio (ed.): *Proyecto Cholula*, pp. 211-242. Instituto Nacional de Antropología e Historia, Serie Investigaciones, No. 19.
- Paddock, John. 1970. Oaxaca in Ancient Mesoamerica. In Paddock, John (ed.): *Ancient Oaxaca*, pp. 83-240. Stanford: Stanford University Press.

- n.d. Mixteca-Puebla Culture in the Valley of Oaxaca. In Stone, Doris (ed.): *Mixteca-Puebla Presence in Trade and Style Variants from Mexico and Central America*. Middle American Research Institute, Occasional Papers, No. 4 (in press).
- Pasztor, Esther. 1978. Artistic Traditions of the Middle Classic Period. In Pasztor, Esther (ed.): *Middle Classic Mesoamerica: A.D. 400-700*, pp. 108-142. New York: Columbia University Press.
- Patterson, Thomas C. 1971. Chavin: An Interpretation of Its Spread and Influence. In Benson, Elizabeth P. (ed.): *Dumbarton Oaks Conference on Chavin*, pp. 29-48. Washington, D.C.: Dumbarton Oaks.
- Paulsen, Allison C. 1976. Patterns of Maritime Trade between South Coastal Ecuador and Western Mesoamerica, 1500 B.C.-A.D. 600. In Benson, Elizabeth P. (ed.): *The Sea in the Pre-Columbian World*, pp. 141-166. Washington, D.C.: Dumbarton Oaks.
- Peterson, Frederick A. 1957. El "Motivo Serpiente" en la Cerámica de Culhuacan. In Franco C., José Luis, and Frederick A. Peterson: *Motivos Decorativos en la Cerámica Azteca*, pp. 37-48. Museo Nacional de Antropología, Serie Científica, No. 5.
- Price, Barbara. 1977. Shifts in Production and Organization: A Cluster-Interaction Model. *Current Anthropology* 18(2):209-221.
- Proskouriakoff, Tatiana. 1968a. *Graphic Designs on Mesoamerican Pottery*. Washington, D.C.: Carnegie Institution of Washington.
- 1968b. Olmec and Maya Art: Problems of Their Stylistic Relation. In Benson, Elizabeth P. (ed.): *Dumbarton Oaks Conference on the Olmec*, pp. 119-130. Washington, D.C.: Dumbarton Oaks.
- Renfrew, Colin. 1979. *Problems in European Prehistory*. New York: Cambridge University Press.
- Robertson, Donald. 1970a. The Tulum Murals: The International Style of the Late Post-classic. XXXVIII International Congress of Americanists (Stuttgart, 1970), Vol. 2:77-88.
- 1970b. The Mixtec Religious Manuscripts. In Paddock, John (ed.): *Ancient Oaxaca*, pp. 298-312. Stanford: Stanford University Press.
- Russell, J.C. 1972. *Medieval Regions and Their Cities*. Bloomington: Indiana University Press.
- Sabloff, Jeremy A., and William Rathje. 1975. *A Study of Changing Pre-Columbian Commercial Systems: The 1972-73 Seasons at Cozumel, Mexico*. Harvard University: Peabody Museum Monographs, No. 3.
- Sanders, William T. 1978. Ethnographic Analogy and the Teotihuacan Horizon Style. In Pasztor, Esther (ed.): *Middle Classic Mesoamerica: A.D. 400-700*, pp. 35-44. New York: Columbia University Press.
- Sanders, William T., Jeffrey R. Parsons, and Robert S. Santley. 1979. *The Basin of Mexico: Ecological Processes in the Evolution of a Civilization*. New York: Academic Press.
- Sauer, Carl O., and Donald Brand. 1932. Aztatlan, Prehistoric Mexican Frontier on the Pacific Coast. *Ibero-Americana* 1.
- Schalvezon, Daniel. 1980. *El Complejo Arqueológico Mixteca-Puebla*. Mexico City: Universidad Nacional Autónoma de México.
- Schmidt, Paul. 1977. Rasgos Característicos del Area Maya en Guerrero: Una Posible Interpretación. *Anales de Antropología* 14:63-73.

- Scholes, Frances V., and Ralph L. Roys. 1948. *The Maya Chontal Indians of Acalan-Tixchel*. Washington: Carnegie Institution of Washington, Publication 560.
- Séjourné, Laurette. 1970. *Arqueología del Valle de México, I: Culhuacan*. Mexico City: Instituto Nacional de Antropología e Historia.
- Seler, Eduard. 1904. The Wall Paintings of Mitla. In Bowditch, Charles P. (trans. and ed.): *Mexican and Central American Antiquities, Calendar Systems and History*, pp. 243-324. Smithsonian Institution, Bureau of American Ethnology, Publication No. 28.
1960. Les Ruines de Mitla. *Gesammelte Abhandlungen zur Amerikanischen Sprach- und Altertumskunde* 3:470-486. Graz: Akademische Druck, U. Verlagsanstalt.
1963. *Codex Borgia, with Commentary by Eduard Seler* (3 Vols.). Mexico City: Fondo de Cultura Económica.
- Shepard, Anna O. 1948. *Plumbate, A Mesoamerican Trade Ware*. Washington: Carnegie Institution of Washington, Publication 573.
- Smith, Carol A. (ed.). 1976a. *Regional Analysis* (2 vols.). New York: Academic Press.
- 1976b. Regional Economic Systems: Linking Geographical Models and Socioeconomic Problems. In Smith 1976a (op. cit.), pp. 3-67.
- Smith, Michael E. 1977/78. A Model for the Diffusion of the Shaft Tomb Complex from South America to West Mexico. *Journal of the Steward Anthropological Society* 9(1/2):179-204.
1981. *Cerámica Postclásica del Estado de Morelos*. Publicaciones del Centro Regional Morelos-Guerrero (Instituto Nacional de Antropología e Historia), Serie Arqueología, No. 1.
- Smith, Robert E. 1955. *Ceramic Sequence at Uaxactun, Guatemala* (2 Vols.). Middle American Research Institute, Publication 20.
1957. The Marquez Collection of X Fine Orange and Fine Orange Polychrome Vessels. *Notes on Middle American Archaeology and Ethnology* 5(131):135-182. Washington: Carnegie Institution of Washington.
1958. The Place of Fine Orange Pottery in Mesoamerican Archaeology. *American Antiquity* 24(2):151-160.
- Spinden, Herbert J. 1948. Chorotegan Influences in Western Mexico. *El Occidente de México, Cuarto Mesa Redonda*, pp. 34-35. Mexico City: Sociedad Mexicana de Antropología.
- Spores, Ronald. 1972. *An Archaeological Settlement Survey of the Nochistlan Valley, Oaxaca*. Vanderbilt University Publications in Anthropology, No. 1.
- Stone, Doris. 1970. An Interpretation of Ulua Polychrome Ware. XXXVIII International Congress of Americanists (Stuttgart, 1968), 2:67-76.
1972. *Pre-Columbian Man Finds Central America: The Archaeological Bridge*. Cambridge: Peabody Museum Press.
- Strong, William D., Alfred Kidder II, and A.J. Drexel Paul. 1938. *Preliminary Report on the Smithsonian Institution-Harvard University Archaeological Expedition to Northwest Honduras, 1936*. Smithsonian Institution Miscellaneous Collections 97(1).

Sweetman, Rosemary. 1974. Prehistoric Pottery from Coastal Sinaloa and Nayarit, Mexico. In Bell 1974 (*op. cit.*), pp. 68-82.

Thompson, J. Eric. 1939. *Excavations at San Jose, British Honduras*. Washington: Carnegie Institution of Washington, Publication 506.

1966. Merchant Gods of Middle America. In Pompa y Pompa, A. (ed.): *Summa Antropologica en Homenaje a Roberto J. Weitlaner*, pp. 159-172. Mexico City: Instituto Nacional de Antropología e Historia.

1970. *Maya History and Religion*. Norman: University of Oklahoma Press.

Troike, Nancy P. 1978. Fundamental Changes in the Interpretations of the Mixtec Codices. *American Antiquity* 43(4):553-568.

Vaillant, George C. 1938. A Correlation of Archaeological and Historical Sequences in the Valley of Mexico. *American Anthropologist* 40(4): 535-573.

1940. Patterns in Middle American Archaeology. In Hay, C.L., et al. (eds.): *The Maya and Their Neighbors*, pp. 295-305. New York: Appleton-Century.

1962 (orig. 1941). *Aztecs of Mexico* (Revised Ed.). Baltimore: Penguin.

Wallerstein, Immanuel. 1974. *The Modern World-System: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*. New York: Academic Press.

Weaver, Muriel Porter. 1972. *The Aztecs, Maya and Their Predecessors*. New York: Seminar Press.

Webb, Malcolm C. 1973. The Peten Maya Decline Viewed in the Perspective of State Formation. In Culbert, T. Patrick (ed.): *The Classic Maya Collapse*, pp. 367-404. Albuquerque: University of New Mexico Press.

1978. The Significance of the "Epiclassic" Period in Mesoamerican Prehistory. In Browman, David L. (ed.): *Cultural Continuity in Mesoamerica*, pp. 155-178. The Hague: Mouton.

Weitlaner, Roberto J. 1948. Exploración Arqueológica en Guerrero. *El Occidente de México Cuarta Mesa Redonda*, pp. 77-85. Mexico City: Sociedad Mexicana de Antropología.

Wiley, Gordon R. 1945. Horizon Styles and Pottery Traditions in Peruvian Archaeology. *American Antiquity* 11(1):49-56.

1973. Mesoamerican Art and Iconography and the Integrity of the Mesoamerican Ideological System. *The Iconography of Middle American Sculpture*: 153-162. New York: Metropolitan Museum of Art.

Wissler, Clark. 1923. *Man and Culture*. New York: Thomas Y. Crowell.

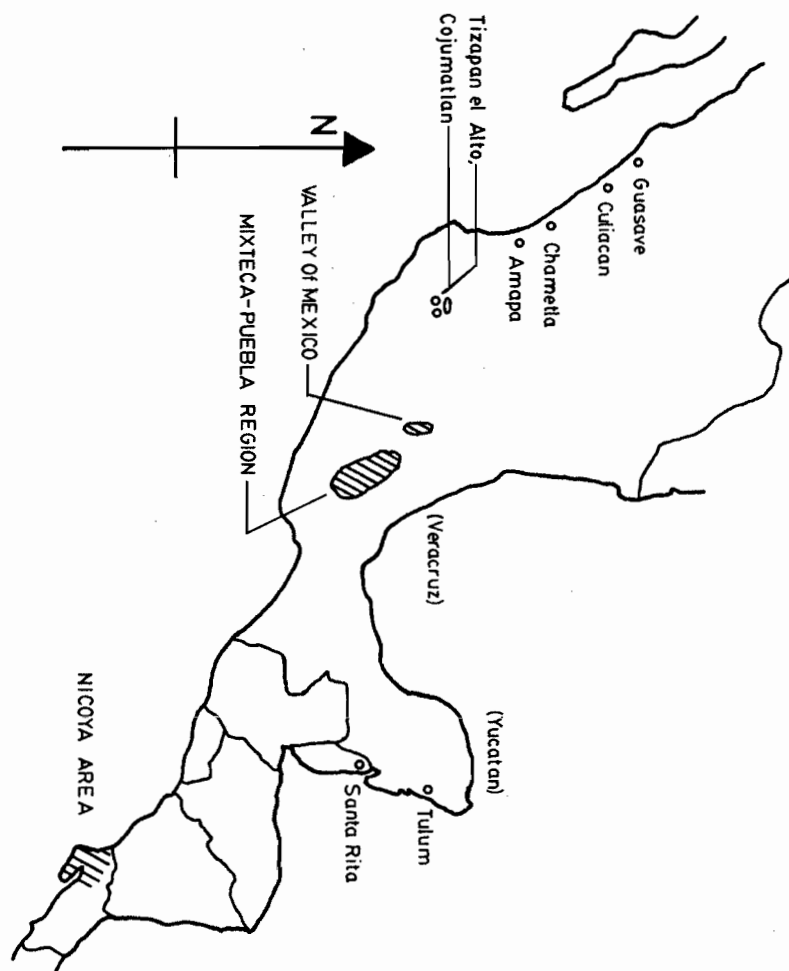
von Winning, Hasso. 1968. *Pre-Columbian Art of Mexico and Central America*. New York: Harry N. Abrams.

1977. Rituals Depicted on Polychrome Ceramics from Nayarit. In Cordy-Collins, Alana and Jean Stern (eds.): *Pre-Columbian Art History: Selected Readings*, pp. 121-134. Palo Alto: Peek Publications.

Nicoya	Late Poly-chrome	Middle Poly-chrome			Early Poly-chrome
Jalisco/Michoacan				Tizatlan	Cojumatlan
Amapa				Tecuallilla	Icuin-tla
Guasave				Guasave	Cerritos
Chamela				Late I (El Taste)	Late II
Culiacan	Late	Middle	Early I	Early II	(Aztatlan)
Periods and Dates	1500 LATE-POST-CLASSIC	1300 MIDDLE-POST-CLASSIC	1100 EARLY-POST-CLASSIC	900 EPICLASSIC	700
Puebla/Tlaxcala	Tlaxcala			Texcalac	
Cholula	Cholul-teca III	Cholul-teca II			Cholul-teca I
Valley of Oaxaca	Monte Alban V			Monte Alban IV	
Tehuacan Valley	Late Venta Salada			Early Venta Salada	

Selected Postclassic ceramic phases (see text for citations).

Map of Mesoamerica showing sites and areas discussed in the text.



Cranial Differences in Two Species of *Cercopithecus* Monkeys: A Multivariate Biometric Analysis

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Discussions of systematics in primate paleontology and in studies of living groups require a broad base of knowledge of variation in both living and fossil forms. The assessment of fossil specimens is dependent upon this base, and phylogenetic interpretations cannot be made accurately without a precise knowledge of present and past polymorphism. In studies of living primates, consideration must be given not only to anatomical and biometric traits, but also to biochemical, genetic, serological, embryological, and behavioral characteristics. In dealing with specimens represented by skeletal material, the data are limited to those characteristics available through biometric and observational techniques. The elimination of unnecessary measures is also necessary; computers provide us with the means to do so objectively for primate samples as has been done for human crania at the infra-specific level by Howells (1969), and numerous others. In numerical taxonomy, numerous methods have been employed, but multivariate analysis, in its different forms, is felt by this author to be the most satisfactory despite the valid criticisms levelled at the various commonly utilized procedures by Kowalski (1970). The scope and precision of the data considered by multivariate techniques, plus the ability to identify diagnostic variables and specific differences between groups as well as to classify specimens, provides a solid base for the eventual assessment of fossil specimens for which, possibly, only a few measurements can be taken. If a multivariate statistical picture of the variation and differences between related groups is known, the probability of a single specimen's affiliation to various groups may be calculated, and which specific parameters may be most useful to employ is also objectively determined. The research presented here represents a step toward the eventual goal of a synthetic view of primate skull variation.

The samples chosen for this study represent adult male crania of two species of the genus *Cercopithecus*. This genus ranges over a wide area of sub-Saharan Africa, inhabiting rain forests, secondary forests, montane forests, woodland savannah, and open sa-