

PRELIMINARY REPORT OF THE CONFERENCE ON THE PREHISTORIC CERAMICS OF THE MAYA LOWLANDS (1965)

POR PATRICK CULBERT
University of Arizona

INTRODUCTION

During the "great explorer" period of Maya archaeology, roughly 1839 to 1925, interest was centered on the ceremonial architecture, the sculpture, the hieroglyphic texts, and the occasional spectacular tombs which were found. Pottery was of interest mainly as tomb furniture or as examples of ancient aesthetics. Chronological value was incidental and implicit. Boas and Gamio had worked out a general ceramic chronology for the Valley of Mexico as early as 1910, but it was not until G. C. Vaillant's thesis (1927) that an attempt was made to chronologically and typologically order the accumulation of Maya pottery. Vaillant based his chronology on the dated stela caches of Copan, on his own work at Chichen Itza, and on a series of tombs with pottery found at Holmul (Merwin and Vaillant, 1931). The descriptive approach that Vaillant used was through large ware groups based on gross decorative and technological features. These were ordered in time and space. Many individual items were necessarily treated *ad hoc*, as Vaillant attempted to integrate a great mass of scattered and disparate material. R. L. Rands (1962) has pointed out that the function of a systematic guide to scattered materials was one of the most lasting values of Vaillant's work. However, it also seems that Vaillant's ware approach was equally important in theoretical impact on studies of Maya ceramics. When the Carnegie Institution of Washington began intensive excavations at Uaxactun a similar descriptive approach was utilized

by both Edith Ricketson (Ricketson and Ricketson 1937) and, later by Robert E. Smith (1955). In addition to the use of the ware concept, Smith's report includes an exhaustive study of attributes such as vessel shape, techniques of decoration and design motif. The Uaxactun analysis was only the second attempt to deal comprehensively with the immense variety of what must be one of the world's most complex and diverse ceramic areas. Both studies of the Uaxactun pottery are loosely structured in analysis and description although Smith's report especially is a model of exhaustively detailed reporting. This was in contrast to the contemporary development of highly formal taxonomic structures in the Southwestern United States and the proliferation of named ceramic types. In fact, the Uaxactun study was deliberately restrained from the use of the Southwestern approach by A. V. Kidder who felt that grave errors of culture historical interpretation were being made in the name of systematics of ceramic description (R. E. Smith, personal communication). Concurrently, in the 1920's and 30's, ceramic studies were being carried on in Northern Yucatan by other workers of the Carnegie Institution. This activity finally produced the work by Brainerd (1958) which, not surprisingly, was in the typically loosely structured descriptive format of wares, with a primary emphasis on shapes as chronological diagnostics. Both of these sequences were known more or less in detail long before final publication and had a great effect on contemporary archaeological work going in other areas and sites. The intervention of World War II and the lull in the immediate post-war years in the archaeological study of the lowlands turned out to be the hiatus marking a turn from one theoretical approach to another in the study of Maya ceramics. However, when studies resumed, they had the enormous advantage of the previous work, even though the theoretical attacks were radically different.

The 1950's began the present period of Maya pottery studies. The Carnegie Institution's terminal field project at Mayapan was the first in a veritable explosion of activity. R. E. Smith, E. M. Shook and others, handled the great amounts of pottery with Smith carrying the ultimate responsibility for analysis and publication of the sequence. The approach to the organization problem was that used at Uaxactun. However, the resumption of field work in the Maya Lowlands by the

Peabody Museum of Harvard brought a new theoretical system to pottery studies, that of Type-Variety. Wheat, Gifford, and Wasley (1958) had published a proposed revised system of taxonomic analysis of archaeological pottery. This was in essence a first statement of the Type-Variety system. Gifford had thereafter accepted responsibility for the analysis of the pottery from G. R. Willey's Barton Ramie Project, and applied the type-variety system. Long and intensive conversations with R. E. Smith convinced him of the theoretical and practical advantages of a system of description which produced comparable analytical units from analysis to analysis. These discussions ultimately led to the refinement of the type-variety concept and its proposed application to Maya pottery in a paper published by Smith, Willey and Gifford (1960). Smith and Gifford, in the meantime, were also working on a revision of the Uaxactun pottery sequence in type-variety terms and Smith went on to revise the unpublished Mayapan analysis in the new terms. Gifford analysed the Barton Ramie pottery using the new methodology (Willey *et al.*, 1965) and R. E. W. Adams utilized the system in working out the Altar de Sacrificios sequence (1963).

The new theoretical approach was only part of the growing complexity of the lowland ceramic problem. The University Museum's long term project at Tikal (1956-66) produced great amounts of data bearing on refinement in ceramic chronology, ancient social structure, and specific culture-historical events. T. P. Culbert, also using the Type-Variety system, became increasingly concerned about correlations of the Tikal material with that of other sites. In Northern Yucatan Tulane University's Dzibilchaltun project had produced the longest continuous sequence in the Maya area, running from roughly Middle Pre-Classic times until the Colonial Period (Andrews 1962). Questions of comparability and dating of Peten types traded into Dzibilchaltun were important, to mention only one of the difficulties raised by this work. R. L. Rands was working at Palenque and with the Piedras Negras pottery. Particularly in regard to the first site, he found great regionalism which seemed to correlate with the distinctive architecture and art style of the site. The Barton Ramie and Altar de Sacrificios work had detected truly Proto-Classic complexes both of such a nature and in circumstances that raised questions about the

means of stimulus of the Maya Pre-Classic to civilization status. In addition, at Altar a new early complex was found. Also at Altar a later intrusive complex of non-Maya origin with important implications for the problem of the Classic collapse was found. As analysis on all of these projects reached advanced stages, increasingly divergent views and increasingly complex pictures were attained.

To summarize to this point, then, Maya ceramic research had gone through an initial period of rather loosely structured analysis correlating with the slow buildup and digestion of data. During this period the primary emphasis was on chronology. By about 1960, an explosion of activity had produced great amounts of new data which reached a sort of "critical mass" in terms of the complications introduced into the culture-historical picture. New and more refined questions were being asked, and, likewise, more detailed and subtle answers were being suggested. However, the conceptual approach seemed inadequate for dealing with the ceramic data and this led to the introduction of the type-variety system of analysis. It was intended that this system would produce taxonomic units of comparable quality and a language of easy communication among analysts.

Among the pressing problems of type-variety analysis was that of the proliferation of ceramic complex names. Each time a new site was dug, went the argument, another list of named complexes was added to the already overburdened literature and the non-specialist would be increasingly confronted with problems of correlation and the meaning of correlations. An impromptu meeting of a number of Mayanists at Harvard University in November 1963 discussed the proposal by Smith and Gifford that a binomial system of names be applied to ceramic complexes. The system was designed as an adjunct to the Type-Variety system and its purpose was to slow down the addition of new names to the literature while giving a short-hand idea of the comparability of two or more complexes. Informal circulation of the proposal among other Mayanists provoked a somewhat acrimonious correspondence over its merits and brought out serious differences of opinion on other matters. These differences seemed to be largely based on the special points of view provided by each investigator's particular body of data. G. R. Willey suggested that a general conference on

Maya Lowland ceramics was in order. T. P. Culbert and R. E. W. Adams undertook to organize such a conference and Culbert obtained the necessary funds for the meeting from the National Science Foundation.¹

The operations of the conference were geared to the Type-Variety approach to ceramic analysis, for most of the participants have used the system and are convinced of its value in systematizing large bodies of data. This does not imply, however, an underestimation of the utility of other approaches. Rouse (1960) has already emphasized the differences between the typological and modal approaches in the study of artifacts. The utility of modal analysis for Maya ceramics is amply demonstrated by Smith's Uaxactun report (1955), and recent advances in functional interpretation of pottery based upon modal analysis (Deetz, 1965; Longacre, 1964; Binford, 1965) make the inherent possibilities of the approach obvious. Culbert, particularly, feels that dangers of oversystematization are inherent in a formalized typological approach, and finds modal analysis the most successful tool for dealing with some of the problems posed by the large Tikal collections. Rands has also used modal analysis extensively in dealing with certain features of the Palenque ceramics.

THE CONFERENCE ON THE PREHISTORIC CERAMICS OF THE MAYA LOWLANDS

Participants were chosen with the idea of getting together those who are currently working with Lowland Maya ceramic sequences plus the directors of the major archaeological projects now in operation in the Maya Lowlands. Because of the importance of the Chiapa de Corzo sequence, the ceramic analyst from that project was also invited. Participants at the conference included R. E. W. Adams, E. W. Andrews, W. R. Coe, T. P. Culbert, J. C. Gifford, R. L. Rands, J. A. Sabloff (secretary), R. E. Smith, B. W. Warren, and G. R. Willey (chairman).

¹ All participants in the conference wish to express their thanks to the National Science Foundation which provided the funds which made it possible.

The purpose of the conference was to discuss Maya ceramics and ceramic complexes from both substantive and theoretical points of view. Substantive questions would deal mainly with the definition of ceramic complexes and their interrelationships. Theoretical matters would concern the nature of the assumptions underlying the formulations of these relationships and the means by which comparisons can be made. The geographical area was the Maya Lowlands and the area centering on Chiapa de Corzo.

The specific agenda adopted by the conference was as follows:

- I The level of the ceramic complex.
 - A. The definition of complex.
 - B. Brief review of Maya Lowlands ceramic complexes.
 - C. The plotting of complexes in time and space ("distributional correlation").
 - D. The relating of complexes on the basis of content *similarity* to construct larger entities.
- II The sub complex level.
 - A. Definitions: Wares, Groups, Types, Varieties, Modes, Attributes.
 - B. Substantive review (recourse to collections in the National Museum).
 - C. Methodological review:
 1. Group vs. type-variety.
 2. Wares.
- III The level of higher culture-historical integration.
 - A. The concept of "ceramic spheres".
 - B. Ceramic regions.
 - C. Ceramic periods (Maya dates, C 14 dates, etc.).
(The concepts of horizon markers or styles and foreign influences in Maya Lowland ceramics will be treated here.)
- IV The level of interpretation of culture process.
 - A. Micro-zones and sustaining areas.
 - B. Phase building.

- C. Developmental *stages* and trends in ceramics (as opposed to *periods*).
- D. Observations on ceramic change in time and space and the various processes that may be derived from these observations.

The conference took place in Guatemala City from August 9-13, 1965. G. R. Willey was chosen as chairman. The conference met in morning and afternoon sessions in a room at the Palace Hotel, Guatemala City and also in a room kindly provided for us at the National Museum of Archeology. One session was spent with the study collections of the National Museum. Notes on each day's meetings were made by Mr. Jeremy A. Sabloff who then, at great cost in sleep, prepared a typewritten draft that same night.² The drafts were read to the conference the following morning and corrected and approved. A final draft of the notes was prepared by Sabloff upon his return to Cambridge for circulation among the conferees for commentary. Willey, Culbert and Adams were designated by the conference as editors of the results, these to be based on the corrected final draft of the notes.

This was the formal aspect of the conference. Informal aspects contributed heavily to its success. Several of the participants had arrived early in Guatemala City and had taken advantage of the hospitality offered by the Tikal Project to spend a few days there discussing ceramic problems. During this time highly detailed and specific examination and comparisons were made between the Tikal sequence developed by Culbert and other ceramic sequences represented in the persons of Rands, Gifford, and Adams. Many of the characterizations of horizons and complexes which follow were based upon these preliminary discussions. Much valuable informal discussion took place after hours, at mealtimes, and during the social activities arranged for the conferees in the evenings. We literally lived ceramics for the duration of the meeting, an experience made bearable by our most pleasant surroundings.³

² We are grateful to Mr. Sabloff his conscientious and concise account of our sometimes confused deliberations.

³ For the many courtesies extended to the conference we offer Sr. Carlos Samayoa Chinchilla, Director of the Instituto Nacional de Antropología e Historia, our warmest thanks. We are also most grateful to Sr. and Sra. Rafael Morales, Sr. and Sra. C. H. Nottebohm, and to Lic. and Sra. Adolfo Molino Orantes for the gracious hospitality extended to members of the conference.

With the rapid exchange and modification of innumerable ideas and hypotheses that characterized the conference, it is impossible in this summary to cite the originators of the thoughts presented. All members of the conference are, in effect, the authors.

Wiley, Culbert and Adams have undertaken to edit the notes and to put them into a more intelligible form and to present our deliberations and conclusions without the inevitable false starts and highly complicated and often confused interaction. The following is therefore not a literal record of the discussions, but a paper based upon them and approved by the conferees as a fair and accurate report. In the process of organization, the formal report differs considerably from the format suggested by the conference agenda. A more straightforward development from simple to complex seems appropriate for presentation here rather than the agenda approach which moved outward from the ceramic complex as the unit most familiar to all participants. Some of the topics on the agenda are not covered in this summary. A presentation by Rands on micro-zones and sustaining areas and one by Warren on the use of computers for ceramic research so impressed the conference that it was felt that they should be prepared as separate papers to be published under the auspices of the conference. A final conference report will be published in *American Antiquity*.

CERAMIC COMPLEXES AND HORIZONS IN THE MAYA LOWLANDS

A considerable part of the first few sessions at the Conference on the Prehistoric Ceramics of the Maya Lowlands was devoted to detailed presentation and discussion of specific ceramic complexes. Methodological and theoretical topics were interspersed in the data presentation when it became obvious that the definition of new concepts or the refinement of old concepts was necessary to deal with situations arising directly from the data. In later conference sessions, the new concepts were considered in greater detail. In this presentation, the substantive material dealing with ceramic complexes and their culture-historical relationships is summarized in Chart I. More detail about specific complexes will be included in the final report.

A sequence of ceramic complexes from a given site is derived from local data and is, in the strictest sense, applicable only at that site. Part of the task of the ceramic researcher, however, is to place his data in a broader frame of reference by relating the local sequence with other known sequences on the basis of shared ceramic content. The sharing of ceramic traits within the Southern Maya Lowlands was extensive enough so that the approximate alignment of complexes from different sites rarely presents a major problem. It is more difficult to align complexes from sites at the periphery of the area and in adjacent regions with those of the Southern Lowlands, but tentative alignments can usually be made.

A goal of the Conference on the Prehistoric Ceramics of the Maya Lowlands was to create a framework of related complexes that would include as many site sequences as possible, and to delineate the ceramic traits useful in fitting other complexes into the framework. The alignment presented in Chart I was achieved by the traditional process of comparing complexes from different sites and placing at a single level all those complexes linked with one another by specific, chronologically significant traits. The term "horizon marker" is used for the ceramic traits which link complexes and the term "horizon" for the complexes related by a given set of markers.

The only complexes included are those with which the conference participants had done research. Other published sequences could easily be related to the general scheme, but it seemed best to restrict consideration to sequences studied first-hand. The geographical focus of the presentation is the Southern Maya Lowlands, consisting of the Peten and British Honduras. Sequences from the Usumacinta-Palenque region, the Central Depression of Chiapas, and Yucatan are marginal in terms of this focus and are sometimes difficult to relate to the central area. Although the subdivisions of the chart are intended to represent relative rather than absolute time, some scale of duration had to be used. The scale also reflects the Peten focus, for it is derived from the GMT correlation of the Maya and Christian calendars a correlation used by all the conferees working with Peten sequences. This scale is simply a convenience and does not reflect a judgment of the conference on the various possible correlations. Emphasis on the Peten and British Honduras results from the fact that more sequences

have been developed in this area than elsewhere, and does not imply that the area was dominant in the course of Maya ceramic development. Since the Uaxactun sequence (Smith 1955) is the best known of the lowland sequences, names from this sequence have been used for horizons whenever possible. A more detailed consideration of the horizons and their component complexes will be included in the final report.

THEORY AND METHOD

The conferees felt that a substantive correlation of ceramic complexes in the Maya Lowlands would not be fully useful without an explicit statement of the assumptions made in achieving the correlation. Although the methodology for ceramic classification and delineation of sequences has been extensively analyzed in archaeological literature, the theory and method involved in the comparison of whole complexes have usually been implicit rather than explicit. This section summarizes the discussion of theoretical and methodological problems that arose during the Conference on the Prehistoric Ceramics of the Maya Lowlands with special emphasis on the problems associated with inter-site comparison.

TYPES AND VARIETIES

Most of the participants at the conference are utilizing the type-variety system of ceramic classification. Since the system is already well established in the Maya area (Smith, Willey and Gifford 1960; Gifford 1960), it need not be discussed here. One revision in the nomenclatural procedure of the system was adopted by the conference. Descriptive terms rather than names may be used to designate varieties for those types which have two or more varieties, while types which have only one variety will continue to use the type name as the varietal designation. For example, a subdivision of the type Guitara Incised on the basis of style of incising might result in the varieties Guitara Incised: Fine-incised Variety and Guitara Incised: Groove-incised Variety. Those participants in favor of descriptive terms for varieties felt that such terms will provide a more

CHART I. CERAMIC HORIZONS IN THE MAYA LOWLANDS

Dzibichaltun	Mayapan	Palenque	Piedras Negras	Barton Ramie	Tikal	Uaxactun	Altar de Sacrificios	Seibal	Chiapa de Corzo
Chechem	Chauaca								
Haaz	Tases								
Zipche	Hocaba								
	Sotula								
Copo (Late Facet)	Celpech	(Post-Huipale)	(Post-Tamay)	New Town	Caban				Tuxtla
		Huipale	Tamay		Enab	Tepu 3	Jimba	"Tepu 3"	Ruiz
		Balunte		Spanish Lookout			Boca (Late Facet)		
		Murcielagos	Chacalhoaz		Imix	Tepu 2	Boca (Early Facet)	"Tepu 2"	Paredon
Copo (Early Facet)		Otulum	Yaxche	Tiger Run	Ik	Tepu 1	Posion (Late Facet)		Maravilla
			Balche				Posion (Early Facet)		Laguna
			Uitz-Naba				Chixoy		
Pitim		Motiepa		Hermitage	Manik (Late Facet)	3 (Late)	Veremos	"Tzakol"	Jiquipilas
						2 (Middle)	Ayn (Late Facet)		
						1 (Early)	Ayn (Early Facet)		Istmo
Xan	Thosuco	Picota		Floral Park	Manik (Early Facet)		Salinas		
				Mount Hope	Cauac Cimi (Sub-Complex)		Plancha (Late Facet)	"Chicanel"	Horcones
Chacab (Late Facet)		(Pre-Picota)		Barton Creek	Cauac	Chicanel	Plancha (Early Facet)		Guanacaste
				Jenney Creek (Late Facet)	Chuen		San Felix (Late Facet)	"Mamom" (Late Facet)	Francesca
				Jenney Creek (Early Facet)	Eb	Mamom	San Felix (Early Facet)	"Mamom" (Early Facet)	Francesca (Early Facet)
Zacnicte						Mamom (Early Facet)	Xe	"Xe"	Escalera
									Dili
									Cotorra

definite indication of the criteria for subdividing types and will reduce the number of arbitrarily named units. Other participants felt that descriptive terms would often prove to be too long and cumbersome, and these preferred the naming system now in use. The method of designation was therefore left to the choice of individual researchers.

WARE

The conference considered the meaning and use of the concept of ware, which may be defined as a number of ceramic types sharing a cluster of technological attributes. Attributes defining wares are perforce among those used to define types, but wares are usually defined after type descriptions have been made and are used to make inferences about economic features such as manufacturing centers and trade. Although there was general agreement that ware is of great utility, particularly when the attributes characterizing it are highly distinctive, no decision could be reached on the proper analytic relationship of ware to the type-variety system. R. E. Smith favors the use of ware as an hierarchial concept above the level of types and ceramic group, making the separation of wares the first procedural step in ceramic analysis. Other participants, none of whom has had as extensive experience as Smith with the use of the concept, feel that the primary use of the ware concept should be at the level of integration and functional analysis, with wares abstracted from completed type definitions.

THE CERAMIC COMPLEX AND ITS SUBDIVISIONS

A ceramic complex is the sum total of associated ceramics which has a convenient and easily distinguished geographical and temporal meaning. Although the term "ceramic complex" is relatively recent for the Maya Lowlands, the concept clearly has been recognized and used in most of the established sequences for the area. The experience of the conference participants in using the concept suggested the desirability of defining subunits which may be useful for the detailed presentation of some complexes. The concepts of *facet* and *sub-complex* were therefore defined.

A facet is a minor temporal subdivision of a ceramic complex useful in cases where changes occur within a ceramic complex that are not sufficiently "convenient and easily distinguished" to warrant the separation of two independent complexes. Such subtleties as frequency shifts between types, stylistic change, the appearance of new modes in a few types, or the introduction of new minor types might signal a facet change. The changes are generally of such a nature that a large sample is needed to detect them. Terms such as "Early", "Middle", and "Late" are used for facets.

A sub-complex is a subdivision of a complex that a significance in cultural interpretation other than that of chronological differentiation. Since inferences about culture are involved in recognizing sub-complexes, culturally significant designations may be used for sub-complexes. It might be possible, for example, to distinguish such sub-complexes as trade or local; ceremonial, cache, or domestic; and upper class or lower class. Since any number of cultural distinctions may cross-cut an artifactual category, a type could conceivably belong to more than a single sub-complex. At a given site, for example, a type might be part of both a trade sub-complex and a mortuary sub-complex.

The question was raised whether a complex name could be extended from the site of initial definition to other localities. It was decided that the same complex name will not be used in more than one major archaeological location. The arguments in favor of independent complex names are the same as those in favor of objective type names. Independent names can be adjusted with a minimum of confusion in any fashion that new data make necessary, while complexes of the same name from different sites would be difficult to rearrange if research proved that they are worth distinguishing. The important objective of giving recognition to close relationships between complexes can be attained through the integrative unit, ceramic sphere, which is discussed in a later section.

PHASE

The archaeological phase is an integrative unit defined by Willey and Phillips (1958:22) as a unit "possessing traits sufficiently characteristic to distinguish it from all other units

similary conceived, whether of the same culture or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time". Coe and Culbert raised the question during the conference of the best method of establishing phases and delimiting them in time. They pointed out that it is customary to establish the dimensions of phases by means of the boundaries of ceramic complexes, with other archaeological categories related secondarily to already established "ceramic phases". For Tikal an attempt will be made to consider the interrelationships of as many aspects of culture as possible before phase boundaries and characteristics are established. With this approach, it may be possible to place phase boundaries at points at which several cultural categories showed simultaneous accelerated change. (See also Coe 1962: 506; Culbert 1965).

Gifford and Adams questioned the comparability of the Tikal phases that will be attained with those that have been determined essentially by ceramic change and felt that they may be units of different magnitude. All the conference members recognize the theoretical and methodological importance of these questions and await the Tikal results with great interest as a pioneer venture into the problem.

A revised procedure in the method of deriving phases may also necessitate a change in phase nomenclature. It is customary to use ceramic complex names for phases, but other names will have to be adopted for sites at which phase boundaries do not correspond with the boundaries of ceramic complexes.

HORIZON MARKERS AND HORIZONS

The consideration of Maya Lowland ceramics at the level of culture-historical integration posed a number of methodological and theoretical problems. The initial problem in synthesis was to achieve an areal framework relating ceramic complexes on the basis of content in a manner that would be both chronologically and spatially significant. Content relationships between complexes were traced by means of horizon markers which are distinctive and chronologically significant

modes shared by two or more ceramic complexes. The use of horizon markers made possible the definition of ceramic horizons, series of complexes linked by sets of horizon markers.

Horizon markers are indicators of cultural contact at a specific period in time. They must therefore be complex and distinctive enough that their existence at several sites is not likely to be the result of independent invention. Markers must also be restricted in their temporal spans in order to assure approximate contemporaneity for the complexes that are linked by them. Any kind of ceramic trait that meets the requirements of distinctiveness and restricted time span can serve as a horizon marker. Such varied elements as trade wares, types, and modes of vessel shape, design elements and artistic style are all useful markers for Lowland Maya ceramics. The spatial distribution of horizon markers need not be extensive. Although many markers cover large areas, some markers have great utility even though they relate only a few sites within a restricted region. The concept of horizon marker is more generalized and less culturally meaningful than the concept of horizon style. Since horizon markers may include quite separate and disparate elements showing different areas of distribution, cohesiveness and stylistic unity are not necessary characteristics. Thus, although the elements of a horizon style would be horizon markers as well, most horizon markers are not parts of horizon styles.

Ceramic horizons are ceramic complexes linked by a set of horizon markers. Since the complexes that define a horizon are related through shared and temporally specific customs in pottery making, they are roughly contemporaneous. While this viewpoint does not deny the possibility of early innovations or cultural lag at some locations, with consequent sloping horizons, it does assume that such phenomena do not usually result in major time lags between sites within a relatively small and culturally homogeneous area such as the Maya Lowlands. Such anachronisms, however, may become more important in future research as a greater number of detailed sequences and related absolute dates become available.

Ceramic horizons are based upon the presence of shared habits of ceramic production but do not involve a consideration of the relative degrees of cultural connections between complexes. Thus, a single horizon may include some very closely

related complexes and others that are quite distinct except for a few markers. The ceramic horizon, then, is a useful tool in establishing the temporal order necessary for cultural reconstruction, but is not itself of such direct cultural significance as other concepts discussed in later sections. A summary of the most important horizon markers in the Maya Lowlands is presents in Chart 2.

CHART 2

Horizon Markers in Maya Lowland Ceramics

1. New Town Horizon

- a) Ixpop Polychrome
- b) Paxcaman Red
- c) Tohil Plumbate
- d) Pyriform jar
- e) Flat bottom plate with bell-shaped feet
- f) Scroll feet

2. Tepeu 3 Horizon

- a) Fine Orange types including: Pabellon Modeled-carved, Ixpayac Incised, Cedro Gadrooned, Alta Gracia Gadrooned, Tumba Black-on-orange, Chablekal Incised, Trapiche Incised
- b) Sanate stamped
- c) Incurved-rim tripod dishes
- d) Jar form-tapered neck, high-shoulder, everted rim, tapering body, indented base
- e) Monochrome red tripod plate
- f) Incurved rim bowl
- g) Flate base cylinder

3. Tepeu 1-2 Horizon

- a) Ojo de Agua Incised
- b) Figure painted polychrome
- c) Glyph-band polychrome

- d) Polychrome tripod plates
- e) Incurved rim bowl (Tepeu 3 also)
- f) Flat-based cylinder (Tepeu 3 also)

A. Tepeu 1

- a) Saxche Orange Polychrome group
- b) Tripod, basal-ridged plate

B. Tepeu 2

- a) Palmar Orange Polychrome group
- b) Zacatel Cream Polychrome group
- c) Red-bar Polychrome
- d) Kan cross design
- e) Dress shirt design

4. Tzakol Horizon

- a) Actuncan Orange Polychrome
- b) Dos Arroyos Orange Polychrome Group
- c) Japon Resist
- d) Lucha Incised
- e) Urita Gouged-Incised
- f) Delirio Plano-Relief
- g) Conventionalization of humans and animals
- h) Basal flange, ring base, polychrome bowls
- i) Rounded Z-angle form
- j) Pitcher form with single handle
- k) Slab foot cylinder tripods with or without scutate lid

5. Floral Park Horizon

- a) Gavilan Black-on-orange
- b) Ixcantio Orange Polychrome
- c) Mammiform feet
- d) Grooved hooked lip

6. Chicanel Horizon (All Facets)

- a) Sierra Red
- b) Flor Cream

A. Chicanel-Early Facet

- a) Repasto Black-on-red
- b) Labial flange

B. Chicanel-Late Facet

- a) San Antonio Golden-brown
- b) Correló Incised Dichrome
- c) Usulután ware and Usulután-derived types
- d) Medial flange
- e) Solid or hollow tetrapodal supports which are non-mammiform

C. Chicanel-Terminal Facet (contemporaneous with 4)

- a) Metapa Trichrome
- b) Mammiform feet
- c) Grooved hooked lip

7. Mamom Horizon

- a) Resist blotches or designs in red-on-buff or red-on-orange
- b) Muxanal Red-on-cream
- c) Mars Orange ware
- d) Daub decorative technique
- e) Chamfering
- f) Cuspador shape

8. Xe Horizon

- a) White-slipped types
- b) Double line break incising on interior of vessel lip

CERAMIC SPHERES

The correlation of ceramic complexes into horizons is a useful tool for resolving the questions of priority and contemporaneity that are crucial for cultural interpretation. Members of the

conference agreed, however, that because contemporaneous complexes may be related in varying ways and degrees, simple correlations are not the only sort of synthesis possible from comparative studies. A distinction should also be made between complexes that are closely related and those that, although contemporaneous, are quite dissimilar.

The concept of ceramic sphere was defined to emphasize a high degree of content similarity between complexes. A ceramic sphere exists when two or more complexes share a majority of their most common types. Whereas the horizon need imply no more than a few connections at the modal level, the sphere implies high content similarity at the typological level.

The choice between including or excluding a complex in a sphere makes possible the recognition of two degrees of content similarity: high content similarity and little or no content similarity. Since these two possibilities clearly cannot encompass the complexity and subtlety of archaeological relationships, the nuances of ceramic relationships should be discussed fully in site reports.

The ceramic sphere to which a complex belongs will be incorporated as a part of the complex name by means of a binominal system of nomenclature which adds the sphere name after the complex name. For example, the Plancha complex from Altar de Sacrificios will become the Plancha Chicanel complex since it is a member of the Chicanel sphere.

The content of a ceramic sphere is the sum total of all the types and modes of its member complexes. The diagnostic content of the sphere consists of those elements shared by all or some of the complexes upon which decisions about membership in a sphere are based. Since the list of major horizon markers in Chart 2 includes most of the elements which determine sphere membership, no attempt will be made here to describe the content of the ceramic spheres. It should be noted, however, that a listing and comparison of the elements within different spheres with consideration of such features as the total number of elements and the proportion of shared, partially shared, and unique elements could yield useful information about the development and spread of a ceramic tradition for an entire region. The substantive comparison of complexes summarized in a preceeding section permits the establishment of 11 ceramic

CHART. 3. Ceramic Spheres in the Maya Lowlands

SPHERES	Uaxactun	Tikal	Altar de Sacrificios	Seibal	Barton Ramie	Piedras Negras
Xe			Xe	Real		
Mamom	Mamom	Eb, Tzec	San Felix	Escoba	Jenney Creek	
Chicanel	Chicanel	Chuen, Cauac, Cauac-Cimi	Plancha	Cantutse	Barton Creek, Mt. Hope	
Floral Park			Salinas	Unnamed Complex	Floral Park	
Tzakol	Tzakol	Manik	Ayn, Veremos	Junco	Hermitage	Naba-Uitz
Tepeu	Tepeu 1, 2	Ik, Imix	Chixoy, Early Pasion	Tepiljote	Tiger Run	Balche, Yaxche, Chacalhaaz
Eznab	Tepeu 3	Eznab				
Spanish Lookout					Spanish Lookout	
Boca			Late Pasion, Boca	Bayal		
New Town		Caban			New Town	

spheres for Lowland Maya pottery. The spheres and their component complexes are presented in Chart 3.

DISCUSSION OF THE CERAMIC SPHERES

The conference sessions devoted to the comparison of ceramic complexes and the definition of ceramic spheres made it evident that the character of spheres differs in ways that may be relevant to culture-historical integration. Variation of the areal extent of spheres, for example, is an indicator of the direction and intensity of culture contact at various times in Maya history. There are also differences in the number and kind of shared elements and in the rate of change within spheres that may relate to general characteristics of Maya culture. The participants discovered in exchanging information that some problems that they had considered peculiar to individual site sequences were, in fact, of a more general and widespread character. For example, several of the participants had encountered difficulty in dividing Tzakol-sphere ceramics into sequent complexes. Conference discussion of the sphere revealed that this problem did not result from inadequate data at the sites involved. It was, instead, a result of a period of great continuity in ceramic tradition during which innovation and change occurred less frequently than in preceeding and subsequent periods.

Although great caution must be exercised in inferring total cultural conditions from a single artifact category, the results of ceramic studies provide evidence of trends and patterns that may be checked in the investigation of other study categories. Developments that prove to be common to many aspects of culture will certainly provide a sound basis for conferences about Maya culture as a whole. The following summary of trends of ceramic development will hopefully be of use to all those interested in Maya culture, whatever their particular areas of research interest.

XE SPHERE

The Xe sphere includes only the neighboring Pasion River sites of Altar de Sacrificios and Seibal. Although a final charac-

terization of the sphere must await completion of the analysis of Seibal ceramics, the relationship between complexes from the two sites seems to be close. External connections of the Xe sphere are undetermined, for the ceramics do not show more than vague similarities to any other known complex.

MAMOM SPHERE

The Mamom sphere covers the central and eastern sectors of the Southern Maya Lowlands. There is a possibility that the sphere may also include the western sector if further study substantiates the impression that sites along the Usumacinta River are within the sphere. The patterns of relationship between complexes are not uniform and tend to show puzzling distributions. For example, daub wares are common at Barton Ramie and Uaxactun, but rare at Tikal, while red-on-buff resist painting is important at Altar de Sacrificios, Tikal, and even outside the sphere at Chiapa de Corzo, very rare at Uaxactun, and absent from Barton Ramie. The earlier complexes within the sphere are less closely related to each other than are the later complexes; in fact, there is some doubt about whether Early Mamom complexes are enough alike to be included in the same sphere.

If, as seems likely, this sphere is related to the initial occupation of large areas of the Southern Lowlands, a period of considerable local differentiation followed by increasing trade and cultural contacts would explain the ceramic developments.

THE CHICANEL SPHERE

The Chicanel sphere covers all known sectors of the Maya Lowlands with the exception of Yucatan. Although Yucatan and Central Chiapas are not within the sphere, the clear relationships between the ceramics of these areas and the Chicanel sphere indicate strong influences from the Peten.⁴ The relationships between member complexes are extremely close and

⁴ Culbert and Andrews favor the provisional inclusion of Dzibilchaltun Late Chacah within the Chicanel sphere, and Culbert would also include Chiapa de Corzo, Guanacaste and Horcones in the sphere.

the same types and modes appear in almost identical form at all sites within the sphere. During the later part of the period covered by the sphere, there are hints of desintegration. Barton Ramie becomes increasingly divergent in the Mount Hope complex, and by the time level represented by the Terminal Chicanel facet and the Floral Park sphere, only Tikal and possibly Uaxactun remain definitely within the Chicanel sphere.

The ceramic data suggest that the early part of the Chicanel sphere witnessed greatly increased culture contact and a considerable uniformity of culture. The distribution of Chicanel-like elements in regions outside of the sphere indicates expansive influences from the Southern Lowlands. The disintegration of the sphere at the end of its history will be discussed under the succeeding Floral Park sphere.

FLORAL PARK SPHERE

The Floral Park sphere includes, formally, only Barton Ramie and Altar de Sacrificios, although the Holmul 1 ceramic complex is probably within the sphere. Relationships between the member complexes are close and center on elements, particularly the first appearance of polychrome painting, intrusive in the Lowlands. Although Tikal, Uaxactun, and Chiapa de Corzo are not in the Floral Park sphere, some of the elements characteristic of Floral Park impinge upon the local traditions at those sites as well.

Floral Park sphere owes its existence to influences from outside the Maya Lowlands. Since the Floral Park complex at Barton Ramie is associated with a probable site unit intrusion, the movement of people as well as cultural contact was involved for part of the region. The source of the influences is uncertain. Willey and Gifford (1961) have suggested the possibility of an origin in the Guatemalan Highlands, a possibility with which Adams concurs on the basis of Altar de Sacrificios data, but Culbert feels that the influences can be traced directly to Salvador and/or Honduras, from which source they affected both the highlands and the lowlands.

At Tikal and Uaxactun the Chicanel sphere persists throughout the time span of the Floral Park sphere. It seems likely

that those two sites were either remote enough or strong enough to resist disruption of the local tradition.

TZAKOL SPHERE

After the disruption of the Chicanel sphere caused by the influences associated with Floral Park ceramics, the ceramic tradition of the Maya Lowlands became strongly reintegrated in the Early Classic Tzakol sphere. Complexes from the entire Southern Lowlands, reaching from Barton Ramie on the east to Piedras Negras on the west, are incorporated in the sphere. Palenque and Yucatan are outside of the sphere, but both show trade sub-complexe of Tzakol derivation. Chiapa de Corzo, on the other hand, is separated and never again does the Central Depression of Chiapas show influence from the Maya Lowlands.

The contents of the Tzakol sphere are a radical departure from Preclassic traditions. Although a number of earlier modes, particularly of vessel shape, continue, they are expressed in new ways and combined with new elements, the most striking of which is polychrome painting. During the period of the Tzakol sphere, distinctive Central Mexican elements such as the cylindrical tripod and styles of incising and painted stucco, influence Maya ceramics, but the bulk of all complexes continues to be of local inspiration. Conformity and resistance to change are striking characteristics of the period. Types and modes are duplicated throughout the Southern Lowlands, with little tolerance for local divergence in decorated pottery. Ceramics throughout most of the area are extremely conservative toward change with the entire period being subsumed within a single complex at several sites.

It seems possible that the ceramics reflect the crystalization of a Classic culture, so unified and successful in its nature that it strongly resists for several centuries the impulses to change generated by the factors of time and space.

TEPEU SPHERE

The extent of the Tepeu sphere is almost exactly equal to that of the Tzakol sphere except for the fact that the impact

of the sphere is less marked on the regions of Palenque and Yucatan.

The character of the Tepeu sphere is quite different from that of the Tzakol sphere, however. The monotonous homogeneity of Tzakol is replaced by a trend toward local diversity, with a number of local varieties and styles in painted decoration. The pace of change becomes much more rapid, so much so that several of the participants favored the separation of the sphere into two sequent spheres corresponding to the Tepeu 1 and Tepeu 2 complexes from Uaxactun.

It is difficult to infer a cultural meaning from the increased heterogeneity of the Tepeu sphere. Although the succeeding period marks a time of great fragmentation of the ceramic tradition, Tepeu gives no impression of decadence or breakdown of patterns. Only toward the end of the sphere, when Altar de Sacrificios and Barton Ramie begin to lose the polychrome tradition, is there the beginning of disintegration. The Southern Maya Lowlands does, however, give evidence of greater isolation from other Mesoamerican areas in Tepeu than in Tzakol, but this could as well be the result of disintegration in other areas of Mesoamerica as an outcome of events in the Lowlands.

EZNAB, SPANISH LOOKOUT, AND BOCA SPHERES

Following the Tepeu sphere, the ceramic unity of the Southern Maya Lowlands gives way to four separate spheres of limited areal extent. The Eznab sphere is localized in the Tikal-Uaxactun region; the Boca sphere, at the Pasion River sites; and the Spanish Lookout sphere, in the eastern part of the Southern Lowlands. In addition to the proliferation of spheres at this time level, the Jimba complex from Altar de Sacrificios and the San Jose V phase are independent ceramic entities outside of any known sphere. The intrusive nature of Jimba further emphasizes the generally descriptive character of ceramic developments at this time.

A striking characteristic of all of the spheres is the drastic reduction or total disappearance of the tradition of polychrome painting. Trade between areas in the Lowlands continues to a limited extent, particularly for the fine paste wares, Altar

Fine Orange and Altar Fine Gray, but other pottery shows a high degree of local differentiation after the disappearance of polychromes.

It seems certain that the ceramic disruption of this time period is related to cultural events of a broader nature, for the fragmentation of ceramic spheres correlates with the breakdown of the stela cult, monumental construction, and other aspects of the Maya hierarchical structure. Similarities of Peten ceramics to those of Yucatan and Andrews' suggestion that influences from Yucatan extended southward at this time may be further evidence of a loss of cultural cohesiveness in the Southern Lowlands.

NEW TOWN SPHERE

Evidence of the New Town ceramic sphere comes only from Barton Ramie and Tikal. The New Town occupation at Barton Ramie is substantial (see Willey, *et. al.*, 1964), but the corresponding Caban complex at Tikal is represented by only a few surface indications. The break in ceramic tradition at Tikal is so complete that a reoccupation of the site by a new people seems the only logical conclusion.

ABSOLUTE CHRONOLOGY

The implications for relative chronology of the integrative units, ceramic horizons and ceramic spheres, are obvious. Both units have temporal dimensions, and the assumption of approximate contemporaneity for the Southern Lowlands complexes within the units met with the approval of all conferences participants. A few instances of temporal lag in parts of the Southern Lowlands were easily distinguished on the basis of ceramic data, lending further credibility to the contemporaneity of complexes for which lags did not seem indicated.

An attempt was then made to assign absolute dates to the integrative units. Radiocarbon dates were available from most sites, and Maya calendric dates for the Classic and Postclassic could be associated with ceramic complexes from the Peten and Yucatan.

CHART. Ceramic Chronology of the Maya Lowlands.

12.90.00 CORRE- LATION	YUCATAN		TIME	PETEN-BELIZE		11.16.000 CORRE- LATION		
	PERIOD	SUB-PERIOD		HORIZONS	PERIOD			
	COLONIAL		1600	NEW TOWN	EARLY POST CLASSIC	12.00000		
12.10-0-0-0	DECADENT	POST MONUMENTAL	1500			11.10-0-0-0		
12-0-0-0-0		MAYAPAN	1400					
			1300					
11.10-0-0-0	TRANSITION	BLACK-ON- CREAM	1200				11.00000	
			1100		10.10000			
11-0-0-0-0	FLORESCENT	MODIFIED FLORESCENT	1000	TEPEU III	LATE CLASSIC	10.00000		
10.10-0-0-0		PURE FLORESCENT	900			TEPEU II	TEPEU I	9.10-0-0-0
10-0-0-0-0			800					TZAKOL III
		700	TZAKOL II	EARLY CLASSIC	8.10-0-0-0			
10-0-0-0-0	EARLY	EARLY II			600	TZAKOL I	PROTO- CLASSIC	
9.10-0-0-0					500			FLORAL PARK
9-0-0-0-0			400	MAMOM	MIDDLE PRE-CLASSIC			
			300			PRE-MAMOM	EARLY PRE-CLASSIC	
9-0-0-0-0	EARLY I	200	CHICANEL					LATE PRE-CLASSIC
		100 A.D.		MAMOM	MIDDLE PRE-CLASSIC			
8.10-0-0-0	TRANSITION	B.C.				PRE-MAMOM	EARLY PRE-CLASSIC	
		100	PRE-MAMOM					EARLY PRE-CLASSIC
8-0-0-0-0		200		PRE-MAMOM	EARLY PRE-CLASSIC			
		300				PRE-MAMOM	EARLY PRE-CLASSIC	
7.10-0-0-0		400	PRE-MAMOM					EARLY PRE-CLASSIC
		500		PRE-MAMOM	EARLY PRE-CLASSIC			
7-0-0-0-0	FORMATIVE III	600				PRE-MAMOM	EARLY PRE-CLASSIC	
		700	PRE-MAMOM					EARLY PRE-CLASSIC
7-0-0-0-0	FORMATIVE II	800		PRE-MAMOM	EARLY PRE-CLASSIC			
		900				PRE-MAMOM	EARLY PRE-CLASSIC	
6.10-0-0-0	FORMATIVE	1000	PRE-MAMOM					EARLY PRE-CLASSIC
		1100		PRE-MAMOM	EARLY PRE-CLASSIC			
6-0-0-0-0	FORMATIVE I					PRE-MAMOM	EARLY PRE-CLASSIC	
			PRE-MAMOM					EARLY PRE-CLASSIC
6-0-0-0-0				PRE-MAMOM	EARLY PRE-CLASSIC			

An absolute chronology for the Maya Lowlands depends to a considerable extent upon the correlation of the Maya and Christian calendars. The majority of participants whose work has been primarily in the Southern Lowlands favor the Goodman-Martinez-Thompson (11.16) correlation. Andrews feels that the problem is still unresolved but points out that radiocarbon dates and archaeological evidence from Yucatan suggest an earlier correlation, such as the Spinden (12.9) correlation. (For a summary of the correlation problem, see Thompson 1935.) Since ceramics are only one of the many lines of evidence needed for a solution, no attempt was made to resolve differences due to the calendric correlation. Therefore, Chart 4, which presents a tentative chronology for periods and spheres, presents two differing views of chronology. The columns to the left which deal with Yucatan are based on the Spinden correlation, while the Peten-British Honduras columns on the right follow the GMT correlation. This disrupts the proper position of the Southern Lowland spheres relative to the Yucatecan periods, but the appropriate ceramic alignments have already been presented in Chart 1. It should also be pointed out that since the presentation of complexes, horizons and spheres focused on the Southern Lowlands many statements and charts reflect the GMT correlation when they refer to durations of periods and chronology, and would need slight revision to be in line with another correlation.

Most of the radiocarbon dates used to prepare Chart 4 are summarized in Willey, Ekholm and Millon (1964), but unpublished dates for Altar de Sacrificios, Tikal and Yucatan were also considered. The general patterns of dates are consistent, although a number of dates were quite aberrant and were disregarded.

Although the Preclassic dates given in the chart suggest a fair degree of precision, they should not be considered firmly fixed. None of the participants would disagree with moving the boundaries of units a century or so in either direction. For the Peten and British Honduras, the subdivision of Early Classic ceramics was so poorly defined and Long Count dates so rare that no subdivision is attempted. The Late Classic sequences show excellent correlations with Initial Series inscriptions and the positions of ceramic complex boundaries at

Altar de Sacrificios and Tikal can be fixed within one or two katuns. Absolute dates, of course, depend on the calendric correlation.

There is a lack of agreement about the chronology of the period following the Tepeu sphere, which may be due in part to variations in the persistence of the sphere in different parts of the Lowlands. The Boca complex at Altar de Sacrificios is thought to begin as early as 9.16 or 9.17 (751 or 771 A.D. in the GMT correlation); Smith (1955: 107) suggests that Tepeu 3 begins at 10.0 (830) at Uaxactun; and Coe and Culbert feel that the Eznab complex at Tikal does not appear before 10.2 (869). Tentative dates for the termination of these complexes reflect the same differences. Jimba replaces Boca at Altar de Sacrificios at about 10.4 (909) and ends around 950. Uaxactun Tepeu 3 terminates about 889 and Tikal Eznab is thought to have persisted until 950 or 1000. Since there are neither radiocarbon dates nor secure Long Count associations for these late complexes, differences of opinion are not surprising. Too little is known about Postclassic complexes of the Southern Lowlands to attempt chronological estimates, and the Yucatecan Postclassic dates are outside of the principal area covered in the conference.

In summary, the absolute chronology of the Maya Lowlands is still being worked out. The correlation of the Maya and Christian calendars still poses a serious problem for relating northern and southern sequences. Radiocarbon dates permit general spans for ceramic units within the Southern Lowlands, but only for the early part of the Late Classic does precision approach intervals of 20 to 40 years in the Maya calendar.

BIBLIOGRAPHY

- ADAMS, R. E. W. 1963. *The Ceramic Sequences at Altar de Sacrificios, Guatemala*. (Unpublished Ph. D. thesis, Harvard University, Cambridge).
- ANDREWS, E. W. 1962. Excavaciones en Dzibilchaltun, Yucatán. *Estudios de Cultura Maya* No. 2, pp. 149-183. México.
- BRAINERD, G. W. 1958. The Archaeological Ceramics of Yucatan. *Anthropological Records*, No. 19. Berkeley and Los Angeles.
- COE, William R. 1962. A Summary of Excavation and Research at Tikal, Guatemala: 1956-61. *American Antiquity*, vol. 27, No. 4, pp. 479-507. Salt Lake City.

- CULBERT, T. Patrick. 1965. The Ceramic History of the Central Highlands of Chiapas, Mexico. *Papers of the New World Archaeological Foundation*, No. 19, Publication 14. Provo.
- DEETZ, James. 1965. The Dynamics of Stylistic Change in Arikara Ceramics. *Illinois Studies in Anthropology*, No. 4. Urbana.
- GIFFORD, James C. 1960. The Type-Variety Method of Ceramic Classification as an Indicator of Cultural Phenomena. *American Antiquity*, vol. 25, No. 3, pp. 341-347. Salt Lake City.
- LONGACRE, William A. 1964. Sociological Implications of the Ceramic Analysis. In *Chapters in the Prehistory of Eastern Arizona, II, Fieldiana Anthropology*. Vol. 55, pp. 155-170. Chicago.
- MERWIN, R. E. and G. C. VAILLANT. 1931. The Ruins of Holmul, Guatemala. *Memoirs of the Peabody Museum*, vol. 3, No. 2, Cambridge.
- RANDS, R. L. 1962. Review of: G. C. Vaillant, 1961, The Chronological Significance of Maya Ceramics. *American Antiquity*, vol. 28, No. 1, Salt Lake City.
- RICKETSON, O. G. Jr., and E. B. RICKETSON. 1937. Uaxactun, Guatemala: Group E — 1926-1931. *Carnegie Institution of Washington*, Pub. 477. Washington.
- ROUSE, Irving. 1960. The Classification of Artifacts in Archaeology. *American Antiquity*, vol. 25, No. 3, pp. 313-323. Salt Lake City.
- SMITH, R. E. 1955. Ceramic Sequence at Uaxactun, Guatemala. *Middle American Research Institute*, Pub. 20. Vol. I. New Orleans.
- SMITH, R. E., G. R. WILLEY, and J. C. GIFFORD. 1960. The Type-Variety Concept as a Basis for the Analysis of Maya Pottery. *American Antiquity*, vol. 25, No. 3, pp. 330-340. Salt Lake City.
- WHEAT, J. B., J. C. GIFFORD, and W. W. WASLEY. 1958. Ceramic Variety, Type Cluster, and Ceramic System in Southwestern Pottery Analysis. *American Antiquity*, vol. 24, No. 1, pp. 34-47. Salt Lake City.
- WILLEY, G. R., W. R. BULLARD Jr., J. B. GLASS, and J. C. GIFFORD. 1965. Prehistoric Maya Settlements in the Belize Valley. *Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University*, vol. 54. Cambridge.
- WILLEY, G. R. and J. C. GIFFORD. 1961. Pottery of the Holmul I Style from Barton Ramie, British Honduras. In *Essays in Pre-Columbian Art and Archaeology*, edited by Samuel K. Lothrop, Cambridge. pp. 152-170. Harvard University Press, Cambridge.
- WILLEY, Gordon R., and PHILIP PHILLIPS. 1958. *Method and Theory in American Archaeology*. University of Chicago Press. Chicago.