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by

Sabloff, McAnany, Fahmel Beyer, Gallareta, Larralde and Wandsnider
ANCIENT MAYA SETTLEMENT PATTERNS AT THE SITE OF SAYIL,
PUUC REGION, YUCATAN, MEXICO: INITIAL RECONNAISSANCE (1983)

BY

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To the memory of our colleague

RAFAEL RAMOS

(1956-1983)

whose tragic death is a loss to us all
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INTRODUCTION AND BACKGROUND

The ancient Maya site of Sayil is located in the Puuc region of northern Yucatan approximately halfway between the sites of Kabah and Labna (Figure 1). It is a very large site both in terms of extensive public architecture and areal extent, although it is not nearly as well known as Uxmal nor are many of its structures visited by tourists. Our current knowledge of the site's overall layout is based on the 1934 map prepared by Edwin Shook under the direction of Harry Pollock during the latter's survey of Puuc architecture for the Carnegie Institution of Washington (Pollock 1980).

A brief initial reconnaissance of Sayil was undertaken in May-June in 1983 with the intention of laying the groundwork for a full-scale multi-year exploration of the settlement and community patterns of the site. This initial research has given us a much clearer picture of the nature of Sayil's settlement than was heretofore available and has allowed us to carefully plan for future research.

Sayil was chosen for study for a number of reasons which we will discuss shortly. Perhaps the overriding reason for undertaking a settlement pattern study at Sayil is the compelling overall need for settlement pattern research in the Puuc region.

The Terminal Classic Period (A.D. 800-1000) in the Maya lowlands is a critical time for archaeological understanding of several of the most important developments in the growth of ancient Maya civilization. During this period, the Classic Maya centers in the south collapsed, the sites in the Puuc region of the northern lowlands had a major florescence, and
Chichen Itza began its rise to prominence (although the exact timing of its rise currently is subject to much controversy). In a more general sense, there were significant demographic and economic changes taking place in the Maya lowlands at this time. While much recent attention has been paid to the collapse in the south, resulting in numerous publications, such a large corpus of published materials has been relatively lacking in the north. However, in order to understand these critical developments in Maya civilization, it is crucial that the growth of sites in the Puuc hills region be studied.

What were the population sizes of the major Puuc region sites? How did the populations change from Late Classic to Postclassic times? Did the settlements of the Puuc zone differ from earlier Classic settlements, given the changing economic patterns of the Terminal Classic Period? Is it at all possible to find any material evidence in the Puuc region for political control of the coastal salt trade? Is an influx of peoples from the southern lowlands into the north visible in the settlement record? Are "foreign" influences, such as "Putun," Toltec, or Oaxacan, present in Puuc region settlements? Can we validate and then explain the "boom and bust" experience of the large Terminal Classic sites and populations? What is the relationship between peoples in the Puuc region and those at Chichen Itza?

None of these specific questions can be answered without intensive settlement pattern and household studies at Puuc region sites, nor can general hypotheses about the growth of Maya civilization be tested. Although Puuc region sites represent possibly the peak of New World architectural development, we have lamentably little information on the people who built and sustained them, how they lived, and how they disposed themselves across
their hilly landscape.

Unfortunately, with the exception of the recent brief pioneering research by Alfredo Barrera Rubio (1978, 1980) and his colleagues from the Centro Regional Sureste (Instituto Nacional de Antropología e Historia - I.N.A.H. around Uxmal, there have been no major intensive settlement studies at any individual site in the Puuc hills. Although there have been large-scale restoration efforts in the ceremonial cores of the principal sites such as Uxmal, Kabah, Sayil, and Labna, such efforts have not extended beyond the immediate centers of these sites. For example, Pollock's (1980) landmark architectural survey, in keeping with the intellectual tenor of the 1930s and 1940s, when it was undertaken, did not greatly concern itself with house mounds or settlement beyond the site cores. As Pollock (1980:xxv) readily admits:

The maps of Sayil and Labna are incomplete in that they omit a good number of small constructions, presumably house mounds, at Sayil and even more at Kabah. This was done consciously to speed up the mapping, which seemed to be consuming more time than we could afford, and it provides another indication of how we tended to exclude the inconspicuous building remains from our architectural study.

It is precisely those remains that we are now concerned to map and analyze.

This is not to say that we are totally ignorant of settlements in the Puuc region. Ruppert and Smith (1957) recorded and mapped the floor plans of a very limited number of house buildings at several Puuc sites, including Sayil, while Bullard (1953) briefly surveyed the area to check for boundary walls. Pollock's architectural survey provides additional information, as does Brainerd's (1958) monograph on the ceramics of Yucatan. In addition, the publication of the Atlas Arqueológico del Estado de Yucatan (Garza Tarazona de Gonzales and Kurjack Basco 1980) provides, for the first time, information
on very general features of settlements all over Yucatan and can serve as a useful comparative base for future settlement pattern studies. None of these studies, however, treats the vital intervening level of community patterns and demography that we propose to study at Sayil.

THE REASONS FOR STUDYING SAYIL

But why Sayil in particular? First, we believe that, on the basis of available data, it is representative of the largest sites in the Puuc region such as Uxmal, Kabah, Labna, and Oxkintok. Second, it has not had the tourist development which Uxmal and Kabah have had and has relatively little modern settlement or agricultural disturbance around it. Third, there is reasonably clear vision in the uncleared areas surrounding Sayil during the dry season. Moreover, the secondary growth does not obscure the archaeological features as does the vegetation around the western Puuc sites such as Oxkintok. Thus, the nature of the dry season growth around Sayil facilitates the identification and mapping of small structures. Fourth, Sayil is situated in the core of the eastern Puuc region, about halfway between Kabah and Labna. Fifth, there is a good base map of central Sayil made by Edwin Shook in 1934, the best coverage currently available for any Puuc site. The Shook map (which was published by Pollock 1980: Figure 164 at a scale of 1:2500) includes most of the ceremonial center and some of the larger centrally located house units. We have been able to obtain a good copy of the original Shook map (through the courtesy of the Peabody Museum, Harvard University) which is being used as a base map for the Sayil settlement study. Sixth, the site has been recommended for research by the Centro
Regional Sureste (I.N.A.H.) and is located near the existing I.N.A.H. field camp at Uxmal, which the Centro has kindly let the project use during research at Sayil. Seventh, all previous studies point to the probability that the bulk of the occupation and visible architecture at Sayil date to the relatively short time span of the Terminal Classic, or Florescent, period. We had considered working at Oxkintok, for example, but it has a significant Early period occupation which might be quite difficult to separate from the gradient to which Puuc settlement was sensitive, since Sayil is apparently the last major Puuc site for some distance to the southwest.

PREVIOUS WORK ON SETTLEMENT PATTERNS AT SAYIL

Although there has been some limited restoration and excavation in the center of Sayil, there is only a negligible amount of information available today about residential structures at the site and the settlement around the ceremonial and administrative center and no analysis of the actual intrasite community pattern, let alone broader intersite settlement patterns. Some domestic houses were included in the Shook map, while Ruppert and Smith (1957:583-584, Figure 5) mapped fourteen "house-type structures" during a two-day visit in 1953. Six of the structures, including one-, two-, and three-room row type buildings, are illustrated in their 1957 report. Pollock (1980:85-86) notes that "Many small structures that presumably were dwellings are not shown on the [Shook] map. These characteristically rest on low artificial platforms with one or more chultuns in and beneath platforms....Stone basins or pilas [are] often associated with these structures." He further notes (1980:85) that there is a "tendency to
locate structures on low natural rises; fair amount of hilltop and hillside construction (e.g., Structures 1B1 and 1) mostly off map." Bullard (1953:265) adds that, "In general, houses at these sites (Kabah, Sayil, and Uxmal) appear to be restricted largely to knolls and heights of land. The low areas of deep soils are avoided." Moreover, Bullard (1953:267) found no evidence for property walls at Sayil or any other of the Puuc sites.

As George Andrews has discussed in *Maya Cities: Placemaking and Urbanization*, our relative lack of knowledge about Puuc region sites may distort our view of them, and of Sayil in particular. He states (1975:361):

> From all outward appearances, Sayil does not seem to embody any unique urban concepts, nor does it present building types that are not found at other Puuc sites. Still, it is unfortunate that it has been relegated to the position of a minor site in terms of the Puuc region as a whole, since this is largely an accident due to the lack of large-scale excavation and restoration at a large enough scale to reveal its real character. This makes it appear to be smaller than its neighbors to the west, but it is doubtful if this is actually the case. The jungle still hides most of its monuments, and the present-day visitor is hard-pressed to make out even the faint traces of its former grandeur. Future work at Sayil may well show that it played a more important role in the history of the Puuc area than is presently suspected, and certainly more data is required before it can be put in its proper perspective in relation to the sequence of events which led to the former concentration of population in this now deserted area.

There simply are no data on what occurs between any two major sites and many "isolated" smaller sites with standing architecture.

**POTENTIAL SIGNIFICANCE OF THE SAYIL RESEARCH**

One could justify a settlement pattern survey of the Sayil area simply because no major intensive settlement study exists anywhere in the Puuc region, the exception being the new studies at Uxmal (Barrera Rubio 1978,
There are other reasons also. It is our hope that new chronological and settlement data from Sayil will allow us to begin to explore a number of important archaeological questions.

There is every indication from previous studies of architecture and ceramics, as well as stelae dates, that Sayil and all the Puuc sites largely date to the Terminal Classic (Florescent) period (A.D. 800-1000) (see Brainerd 1958; Pollock 1980; Smith 1971; Willey and Shimkin 1973). Brainerd (1942:256), for example, states: "Our large collections from the Puuc region sites of Labna, Sayil, and Kabah contain no pottery equivalent to that of the Mexican period at Chichen Itza." Andrews V (1979) and Ball (1979b) in their recent overviews of Puuc archaeology essentially agree, although they would place the beginning dates slightly earlier and the ending dates somewhat later. The recent research by the Centro Regional Sureste (I.N.A.H.) around Uxmal uncovered a few sherds from Preclassic and Early Classic times, but most of the sherds again date to Terminal Classic (Florescent) times (Barrera Rubio 1978:4; cf. Brainerd 1958 and Ball 1979a).

We firmly believe that learning more about the cultural developments of this period in the northern lowlands is crucial for an understanding of the processes which led to the collapse of Classic civilization in the southern lowlands and the concomitant florescence in the north. Various authors in The Classic Maya Collapse volume, including Adams, Andrews IV, Graham, Webb, Willey and Shimkin, and Sabloff, link events in the Puuc region and Chichen Itza with the collapse of Classic civilization in the south. Andrews IV (1973:258), in fact, wisely suggests that "if Maya civilization continued to flower in the Central and Northern Lowlands, after it became virtually extinct in the south, these areas should form the ideal testing
ground for hypotheses regarding collapse in the south. If any given set of
conditions acted as determinant in one section of the lowlands, why did
it fail to do so elsewhere?"

Settlement research at Sayil should allow project members to test
some of the current hypotheses that have related the collapse in the south
to the florescence in the north (see, for instance, Ball 1974, 1977, 1978,
1979a:27-30; Thompson 1970:Chapter 1). In addition, we should be able to
answer the kind of question posed by Willey and Shimkin (1973:471):

In brief, did populations of the Southern Lowlands move north
to take up residence around emerging new centers in the Rio Bec,
Chenes, and Puuc regions in the ninth century A.D.? G. L. Cowgill
suggested something like this a few years ago (Cowgill 1964), with
the added speculation that they might have done so under foreign
or non-Classic Maya direction.

The Sayil project also should begin to answer some of the pivotal
questions surrounding the relationships among the southern lowlands, Puuc
region sites, and Chichen Itza, which were first raised many years ago by
Proskouriakoff (1951) and Rands (1954). As the senior author noted in The
Classic Maya Collapse volume nearly a decade ago (Sabloff 1973a:125-126):

It is of much interest that many of the non-Classic Maya traits
which appear on the Seibal stelae and on the Pabellon Modeled-
carved vessels can also be found on stone sculpture in the Puuc
region and at Chichen Itza....it is certainly reasonable to
suggest that there were fairly close cultural connections
between the groups which made and imported sculptural style
there, and those groups which immigrated to the Puuc area and
to Chichen Itza. Moreover, the time gap between the influx
of non-Classic Maya in the southern Lowlands and the arrival of
the Toltecs at Chichen Itza may have been quite small indeed.

Suggestions such as this one have been greatly tightened and refined since
the time of the School of American Research collapse seminar. Nevertheless,
basic chronological questions such as the non, partial, or total overlap of
the Puuc florescence and the heyday of Chichen Itza (see Andrews and Robles
1982; Ball 1979a; and Lincoln 1982, among others, for important statements about the overlap problem), upon which a number of exciting hypotheses rest (see, for example, the recent article by Chase and Chase 1982), desperately need new data from the Puuc region in order to be answered.

The proposed field research will allow us to begin to explore a variety of current ideas about the role of the Puuc region sites in the evolution of Maya civilization, including those just mentioned. In addition, our research also will allow the exploration of several other important questions of a more general nature.

First, the stimulating hypothesis of Kurjack, Garza T., and Lucas (1979) concerning the crucial role of soil quality and agricultural exploitation of the Puuc soils to settlement will be examined in light of the detailed settlement data we plan to obtain at Sayil. In particular, the nature of settlement on or adjacent to the productive soils located between the knobby or "conekearst" hillocks which characterize the environment of Sayil will be examined (see Barrera Rubio 1978; Isphording 1975:255; Kurjack, Garza T., and Lucas 1979; see also Wilson 1980). Because Kabah, just 7 km to the north, lies out of the conekearst region in the adjacent flatter Puuc upland, a transect between the two offers the possibilities of detecting direct settlement response to improving edaphic and topographic changes. Conversely, a transect southwards towards Xcalopec offers a similar possibility to explain the apparent lack of big sites (or at least public architecture) in that direction. Our analysis of these preliminary or general data suggest the hypothesis that there existed a line of soil availability and productivity (total agricultural potential) lying perpendicular to the Puuc ridge. Thus, there may exist significant north (Santa Elena) and south (Bolonchen) sociopolitical zones as well as the previously proposed western
and eastern Puuc zones. In sum, the Sayil project will undertake an open-ended examination of the relation of soil types to settlement patterns.

Second, the Puuc region has rich soils but extremely few reliable and permanent sources of water. From all previous work in the Puuc, it appears that Maya settlement there began and ended with their brilliant invention and use of underground cisterns or chultuns. A great number of chultuns are now known for Sayil, almost one per household, and much more data on their technology, associations, and implications will be sought. Chultuns were an essential means for managing and accumulating periodic rainfall for everyday use, especially during the perilously long dry season. Additionally, Barrera Rubio's (1978) initial findings on Uxmal, which suggest a correlation between more elaborate domestic structures and chultuns, could be extended and their implications for social control closely examined. On the basis of demographic and locational patterning, it should be possible to formulate more detailed, testable hypotheses about the role of water availability and control in general for the cultural development of the Puuc region.

Third, intensive settlement and chultun data should also allow us to test Brainerd's (1958:30) hypothetical demographic figures which mainly were based on rainfall data, collection areas, and size of chultuns. Using these data, Brainerd was able to arrive at figures on the quantity of water which could have been stored in chultuns during the dry season. Based on minimal need estimates of 2 gallons of water per day per family, Brainerd arrived at the hypothesis that at least 50 people could be supported by each chultun. Since people were absolutely dependent for water on little else beyond their chultuns, estimation of population from chultun numbers and capacities should be an extremely stringent new check on population totals as traditionally estimated from dwelling counts, labor use, or agricultural potential. A
predictive model of chultun location may allow us to project total population. In fact, the virtual absence of functioning chultuns today in the general Sayil area appears to be correlated with the very low modern population density.

Fourth, detailed data on settlement patterns, domestic units, and possible workshop areas, obtained by mapping the horizontal excavation, and the assignment of dynamic meaning to these data, should permit the examination of hypotheses about the nature of changing economic patterns during Terminal Classic times (see Sabloff 1977; Sabloff and Rathje 1975; Webb 1973). In particular, the project may be able to shed some light on the rise of bulk trade in salt from coastal Yucatan and possible control of this trade by peoples in the Puuc region, although such a task may prove difficult (see A. Andrews 1980a, b; Ball 1977). Additionally, we will search for means to monitor the hypothesized growth of a powerful merchant elite as part of the settlement research program. Contributing to these studies will be new data on artifact (tool) inventories for analysis of household and craft specializations.

The same detailed data should also provide a broad base for sociological analyses of household composition and organization, the functions of the different structure types, the correlates of standing architecture, facade orientation and display as impression management, relative status, and additional data on the vexing question of the function(s) of multi-room buildings (some called "palaces").

Fifth, in order to fruitfully test the kinds of questions just mentioned, most of which are closely related, the Sayil project will attempt to operationalize a research strategy that emphasizes large-scale horizontal
exposure of small structures and adjoining open space as much as mapping and test pitting. The small amount of previous settlement research in the Puuc region should enable the Sayil project to break away more easily from earlier fixations on architectural excavations and biases and assumptions regarding the nature of ancient Maya settlement (see Sabloff 1983 for a fuller discussion; see also Ashmore 1981, Tourtellot 1983). The results of the Sayil project should begin to assign unambiguous meaning to the record of Maya settlement that archaeologists see today (see Binford 1981, 1983; Binford and Sabloff 1982; Sabloff 1984). In the past, functional identifications often have been made on the basis of loose analogies at best. Inferences about political or economic developments are usually untestable because it is not clear how different political systems or economic activities can easily be monitored in the archaeological record. By undertaking detailed historical studies in conjunction with the field research, we hope that the careful horizontal exposure of house units and surrounding areas will allow us to monitor field data relevant to some of the stimulating models which have recently begun to appear in the literature (such as the feudal model of ancient Maya sociopolitical organization as suggested by Adams and Smith 1981 [also see Freidel 1981] or the more general model of peer-polity interaction as defined by Renfrew 1982 [also see Sabloff 1982]).

In sum, there currently exists a significant gap in archaeological understandings of the growth of ancient Maya civilization in regard to the major settlements in the Puuc region of northern Yucatan. The research at Sayil will not only add to our knowledge about the spectacular Puuc architectural achievements as seen at Sayil but more particularly will allow us to initiate an examination of the underpinnings of the remarkable 200-year achievement of peoples in the Puuc region. The 1983 research at Sayil has
begun to help to rectify past neglect and attempt to indicate how archaeologists can begin to sort through the many stimulating and plausible, but currently untestable, hypotheses about the development of Maya civilization.

Finally, understanding the Puuc system of soil, water, and population management (or mismanagement) could have significant practical ramifications for future Yucatecan development planning for this zone. Explaining both the success of the ancient inhabitants of Sayil and other Puuc sites in concentrating and supporting large numbers of people, a concentration far exceeding the modern one, as well as their relatively rapid failure, could provide modern planners with highly useful information. Archaeologists often talk about the potential relevance of their research. At Sayil, we have a real opportunity to benefit the discipline of archaeology, the widening interest in northern Yucatan, and the modern inhabitants of the area.

RESULTS OF THE 1983 FIELD SEASON

INTRODUCTION

Our initial five-week reconnaissance of Sayil was undertaken in May-June, 1983. The reconnaissance consisted of (1) a general exploration of the central zone of the site, (2) an intensive examination of a 500 x 200m survey area to the west of the Great Palace, and (3) an intensive examination of an area covering 70,000m² near the stelae platform at the south end of the north-south causeway.

On the basis of these initial surveys, some definite, albeit quite preliminary, impressions of the settlement at Sayil emerged. In particular, three parameters which seem to have influenced the settlement at Sayil and
the form of residential platforms were found. They include (1) the general
topography, (2) localized surface outcrops of limestone, and (3) the need
to maximize water collection and storage.

Settlement at Sayil is often positioned on low to substantial rises
of land (see Pollock 1980:285). Given the highly variegated landscape
of Sayil, the inhabitants had numerous choices as to locations of residences
and other structures. This situation gave rise to a settlement distribution
which appears, at first glance only, to be totally irregular but which
actually shows much patterning or hints of patterning. The residents of
Sayil regularly used natural outcrops of limestone as the foundations or cores
of platforms, building around the tops of these outcrops with rubble boulders
and filling in with small stones and earth. Such usage presumably saved
considerable labor.

In terms of the structure units themselves, a major concern appears
to have been to construct platforms which harbored chultuns to store water
and to facilitate drainage or rain water into the chultuns (see Figure 2
for an idealized cross-section). Often the front edge of platforms support­
ing residential structures, either perishable or nonperishable, would be
extended so as to provide a greater catchment area for the chultuns. Or,
residential or other platforms would be situated on support platforms to
maximize the drainage into the chultuns. Deep stone basins (pilas), from
one to a considerable number, are often found nearby, as are, to a lesser
extent, shallow basins (which look like traditional metates). Microscopic
examination of preserved interior surfaces of pilas are needed in order
to see if they were used for grinding. Functional comparisons to shallow
basins could then be made.
It also should be pointed out that in some cases the inhabitants of Sayil built artificial terraces into the sides of natural hills (or ultz), presumably to help catch water run-off, and, in several instances, they built chultuns into these terraces. The ground leveling achieved by the terracing sometimes served the purposes of foundations for residential structures and perhaps for garden plots, too.

An additional class of features consisting of concentrations of small stones, known locally as chich mounds, also were found. These features, which are basically low rubble mounds without retaining walls, were not associated with chultuns and discovery of their function will be an important objective of future research at Sayil.

THE SURVEY

The first season of settlement pattern survey at Sayil was directed towards three principal goals: (1) to determine the density and character of settlement in the hills surrounding the valley floor, (2) to evaluate the 1934 map of Sayil prepared by Edwin Shook in terms of selective biases which caused many small structures to be ignored in the earlier mapping, and (3) to provide a basis for planning a long term research strategy for the site.

We achieved these goals by conducting surveys in two separate areas of the site (Figure 3). Our first survey area was a 500 x 200m zone immediately south of the Great Palace and west of the sacbe (causeway). Labelled the Western Transect (see Figure 4), this survey zone encompassed six structures previously mapped by Shook and also crosscut significant topographical variability (with 25m of relief).

The second survey zone was located at the southern end of the sacbe
immediately north of the Southern Palace and the stelae platform (see Figure 5). The amorphous shape of this area, the South-Central survey zone, was due to the fact that we were reaping the archaeological harvest of an accidental burn of a zacate grass field. In this 70,000m² area, we had unparalleled visibility and were able to carefully evaluate the original map and add a number of additional structures which had not previously been mapped. In total, 170,000m² of land were intensively surveyed and mapped during the 1983 field season.

MAPPING CONVENTIONS AND TERMINOLOGY

A brief discussion of the original settlement map is in order. We were very fortunate to have the 1934 map of Sayil on which a large percentage of the standing architecture was mapped in excellent detail. It is a difficult task to tie together maps which were made fifty years apart, but is certainly worth the effort if we are not to duplicate past work. On the whole, we found that large structures were rendered in faithful detail on the 1934 map, although many of the smaller structures were either not mapped at all or not mapped in adequate detail. In addition, the spatial relationships among structures regardless of size were occasionally incorrect. Using a tight survey control net in both our survey zones, we have adjusted the locations of several structures in order to present an accurate map of the relationships among structures.

Due to the dispersed nature of this Puuc community, we refer to structures (usually large basal platforms supporting buildings with associated features) or apparent groupings of structures as "feature clusters" in order to avoid drawing any premature functional conclusions. The principal
features found in the surveys are discussed in the following paragraphs. Then each feature cluster in both survey zones will be described. Finally, feature classes are briefly analyzed, and the preliminary results of our survey are presented.

STRUCTURES

Eight preliminary classes of structures have been defined. (1) The majority of the feature clusters at Sayil are built on top of rubble platforms or terraces which frequently have chultuns constructed within them. These rubble platforms or terraces (here called basal platforms or terraces) are often elaborations of limestone outcrops so that the bedrock out of which the chultuns are carved is actually quite close to the surface (see Figure 2). Accordingly, the height of the basal platforms varies from 1.7 to 2.5m depending on local topography. Platforms are constructed of limestone rubble varying in size from cobbles less than 10cm in maximum length (in the Maya language called bak chich) to large 30-50cm long boulders and are sometimes bordered by large roughly faceted limestone boulders. (2) There is a class of small platforms of mounds (generally less than 16m² in area) which are built with bak chich and usually lack retaining walls. These mounds are found at ground level and are not supported or elaborated by basal platforms. These features are locally called chich mounds or simply chiches. At present, we are not at all sure this type of structure actually supported buildings. (3) Chiches of more variable sizes also are one of five types of structures which are built on the tops of basal platforms. The other types include (4) footing walls: an alignment of shaped or non-shaped stones serving as foundation walls for perishable
buildings, (5) standing buildings with dressed stone walls and doorways which frequently are defined by large stone door jambs, (6) definitely vaulted buildings, and (7) building platforms. This last category refers to small platforms with retaining walls; it also is presently used to classify the features rendered with dashed lines on the original Shook site map. Upon close inspection, many of these features turned out to have foundation walls (although not all of the platforms were reexamined in 1983). (8) Terrace retaining walls occur in both survey zones but particularly in the hillier sections of the Western Transect. These terraces, from 3 to 50m in length, are constructed of large, roughly faceted limestone boulders holding back an earthen fill. Additionally, dense, amorphous scatters of bak chich were found on the slopes of the hills or conekearsts. Since these features do not appear to occur naturally, we presume that they are a result of eroded terraces which were never supported by boulder retaining walls.

CHULTUNS

Chultuns are another class of features found in association with the basal platforms. The chultuns appear to have been constructed for the purpose of rain water storage. They were excavated into the basal platforms; the plaza surfaces surrounding the chultuns generally slope towards the chultun opening. Occasionally, there is an arc of stones delimiting the downslope side of the catchment area. The arc is spaced from 2.5 to 6.0m from the chultun opening (see Figure 5, Feature Clusters E, P, and R). The constricted neck of the chultun is actually a stone-lined opening through the basal platform. Below the platform, the shape of the chultun assumes the form of
a bell-shaped chamber excavated out of bedrock to a depth ranging from 1.5 to 3.0m. The plaster sealing the walls of the otherwise permeable limestone cavity is in variable states of preservation, ranging from intact to completely exfoliated. A few chultuns have stucco figures of frogs or turtles on the inside walls. In addition to chultuns, another type of depression was mapped in the Western Transect. These features are large, shallow depressions sunk into platforms and occasionally defined by a wall partially encircling the circumference of the depression (Figure 4, Feature Clusters 10, 15, and 22). The function of these features remains enigmatic; collapsed chultuns are a possibility, but most collapsed chultuns were easier to identify.

THE WESTERN TRANSECT

We set survey controls into this heavily vegetated area by clearing and staking a baseline that ultimately continued for a kilometer due west. At 100m intervals, 200m long cross-lines were established. A total of five cross-lines were set in. This procedure yielded ten survey blocks which were 100m on a side with three borders demarcated by a line (brecha) cleared of bush and staked at 25m intervals.

This survey net was established with a Leitz 115 transit; elevation shots, taken at 25m intervals, supplied the data base for the contour interpolations. Each grid was surveyed by a team (usually consisting of two individuals armed with machetes) spaced at 25m intervals and maintaining a constant compass bearing across the grid. The survey team located, flagged, and took preliminary notes on features and topography within the quads.

Subsequent to this discovery phase, additional lines were cut from
grid stakes to the features in order to tie them into the grid. Features were then cleared and mapped by tape and compass. If the features were immediately adjacent to a survey line, they were mapped with the transit. A total of 32 feature clusters were located within or adjacent to the survey grid. Of these 32, 9 clusters (#1-8, 20) had been previously mapped - only their locations and features were verified. Two clusters (#21, 32) outside of the grid were reconnoitered and sketched. The remaining 21 feature clusters were mapped in detail. In sum, a total of 100,000m$^2$ of land was 100% mapped.

In addition, the central brecha was extended for another 500m beyond the initial 500m of the intensively surveyed zone. Limited observations were made adjacent to this cleared line from 500m to 1km west of the baseline. Interestingly, observable cultural features seemed to drop off dramatically beyond the 500m point. Whether or not a western limit of dense settlement can be defined at this point remains to be tested.

We now turn to a brief description of each feature cluster. Data on basal platform area, type and size of superstructures built on basal platforms, number of rooms (if relevant), type and size of associated structures, number of chultuns, and number of stone basins are presented in Table 1.

**DESCRIPTION OF FEATURE CLUSTERS IN THE WESTERN TRANSECT**

**Feature Cluster 1.** Present on the original site map, it includes a tandem roomblock (which consists of single rows or two rows of rooms unless otherwise stated) with a vaulted roof and an L-shaped chich mound. It is situated on a low basal platform contiguous with the sacbe. This cluster is notable for its lack of chultuns.
Feature Cluster 2. Previously mapped, this cluster consists of a roomblock with a vaulted roof and three building structure platforms. These structures and two chultuns were built on a low basal platform. Foundation stones for two buildings (one with one room, the other with two) lie immediately to the east of the basal platform.

Feature Cluster 3. Previously mapped, this cluster was rendered with dashed lines for the four structures and with naturalistic contour lines for the basal platform. A chultun was constructed in a southern projection of the platform.

Feature Cluster 4. Previously mapped, this cluster consists of two roomblocks of foundation stones oriented at right angles to an interior plaza with a chultun. The chultun has been used in historic times as a sascabera (a small mine for lime), but fragments of original plaster are still preserved on the walls of the chultun. These features are supported by a low basal platform which grades into a limestone outcrop. A large low platform projects to the east with a chultun in the northeast corner.

Feature Cluster 5. Previously mapped, the cluster is situated on an elongated platform which is oriented north-south. It consists of a two-story roomblock with vaulted rooms, which is built around a solid core, a chultun (which is now filled), and a low chich platform, all of which were constructed on the northern portion of the platform. The constricted middle portion of the platform was covered with a long two-level building platform. In the slightly wider southern extension of the platform, there is a north-facing roomblock with one of the two rooms having doorway columns. The open plaza space in front of this structure was littered with stone basins. A chultun, which was used historically as a sascabera, was located directly east of this
Feature Cluster 6. Previously mapped, this cluster consisted of a roomblock with stone walls built on a tri-level basal platform. Two chultuns are located on the upper levels of the platform. Like Feature Cluster 5, the open plaza in front of the north-facing roomblock contained several stone basins.

Feature Cluster 7. Previously mapped, but not in great detail, this tri-level basal platform, which lies mostly outside the transect, supported five superstructural platforms. The latter were either chich mounds, or more likely, foundation alignments. Three chultuns were sunk into the rubble platform with a fourth chultun located off the north end of the platform.

Feature Cluster 8. Previously mapped, this low basal platform is outlined by a boulder retaining wall on the west and south sides. The north and east sides are natural bedrock outcrops. The depression in the interior of the platform had been labelled a chultun; however, upon revisiting this feature, we could find no definite chultun attributes which would justify this interpretation.

Feature Cluster 9. This is a small platform with retaining walls on the east and west sides. It was built on top of a limestone outcrop with a natural plaza space located to the east of the platform.

Feature Cluster 10. Built on a limestone outcrop, this basal platform supports a roomblock with a vaulted roof, a small chich mound, and an enigmatic depression (which does not appear to be natural) in a slightly lower platform on the northeast corner of the complex. There are several stone basin fragments in the plaza in front of the south-facing roomblock. The cluster also is notable for its lack of a chultun.
Feature Cluster 11. Perched on a limestone outcrop, this cluster consists of a low structural platform built on top of a basal platform. Both platforms have preserved retaining wall segments along the north edge. To the west of this complex, at the base of the outcrop, there are three stone basins in a flat natural plaza separating Feature Cluster 11 from Feature Cluster 12.

Feature Cluster 12. This L-shaped basal platform is built over a limestone outcrop which continues to the east of the artificial platform edge. The north, east, and south sides of the platform are well-defined by large boulder retaining walls. There are two superstructures on top of the platform: a chich mound and a structure platform with a well-defined eastern retaining wall. The southern projection of the platform appears to be the catchment area for the chultun (which is in an excellent state of preservation).

Feature Cluster 13. Situated near the top of a uitz, this cluster has well-defined platform retaining walls and foundation alignments. The basal platform for this cluster is bordered by large boulders on the north and east (downslope) sides of the complex. Three structural foundations and their subsidiary platforms were constructed on top of the basal platform. At the southern end of the cluster, there is a chultun which seems to have been modified for later use as a sascabera. In the open plaza area at the north end of the complex, there is a concentration of stone basins.

Feature Cluster 14. Notable in its proximity to, but structural distinction from, Feature Cluster 13, this feature cluster lacks retaining walls, stone basins, and chultuns. Located on top of the uitz, this cluster consists of seven small chich mounds situated on a rubble platform with a steep drop to the east and a possible staircase linking the cluster to Feature Cluster 13. A small isolated chich mound 30m to the northwest of the rubble platform
also was included in this cluster.

Feature Cluster 15. This cluster is a composite of a group of dispersed features arranged in a step-like fashion at a lower elevation than Feature Clusters 13 and 14 to the north and Feature Cluster 18 to the south. A three-sided boulder retaining wall, opening to the downslope side, forms the eastern side of this cluster. To the west of this wall is a 30m long terrace retaining wall which virtually extends from Feature Cluster 14 to 18. This retaining wall forms the eastern edge of a stepped platform which is probably a modification of naturally stepped contours. There is a chultun-like feature in the lowest level and a depression 3-4m in diameter and 1.2m in depth, in the middle level. Small segments of terracing were found on the western slope of the feature cluster, and bak chich also blanketed much of the slope.

Feature Cluster 16. A naturally flat segment of land on the steep slope east of Feature Cluster 15 provides the location for a bilevel chich mound and a segment of terrace retaining wall. A sascabera is located 20m downslope from the chich mound.

Feature Cluster 17. A single course of large boulders (up to 80 x 80cm) forms a terrace at the base of a very steep-sided uitz which is topped by Feature Cluster 18. The fill behind the terrace is earthen; the level area behind the wall expands to a maximum of 13.5m in width at the northern section of the wall.

Feature Cluster 18. This cluster is notable because it contains one of the two structures we mapped on the transect which had a vaulted roof and also because we discovered a fragment of a door jamb with a hieroglyphic carving on it. The roomblock was constructed atop a steep-sided rubble platform which
contained a chultun in the open plaza in front of the roomblock. A stone basin was found at the southern edge of the plaza. A small amorphous chich mound located 12m southeast of the platform edge was included in this cluster.

Feature Cluster 19. This triple plaza complex sits atop an agglutinated basal platform. The cluster includes a roomblock with standing walls on the easternmost side, two well-defined and two ill-defined roomblocks with foundation alignments, three chich mounds without retaining walls, and a small bordered platform. Both the southern and eastern plazas have chultuns, and stone ring fragments, parts of the chultun mouths, were also found on the surface. An amorphous pile of dressed stone blocks, the depositional context of which is totally enigmatic, was found in the western plaza. Directly in front of the north-facing roomblock located at the south end of the eastern plaza there is a large grouping of stone basins. A large and small chich mound located 90m and 35m east of the southeast corner of the basal platform were included in this cluster.

Feature Cluster 20. This cluster was present on the original site map, but was mislocated 100m east and 50m north of its true location. Three structure platforms are situated on a low bilevel basal platform into which two chultuns were built. A third chultun-like feature occurs off the platform to the west.

Feature Cluster 21. Located outside of the survey grid, this cluster was sketched but not mapped. Three superstructural platforms or roomblocks were built on a high rubble platform which grades into a bedrock outcrop on its west edge. There is a single chultun in this cluster.

Feature Cluster 22. This amorphous mound of large limestone boulders is
marked by an interior depression which is 6m in diameter and 0.5 in depth. A single fragment of a stone basin was found inside this cavity.

Feature Cluster 23. The basal platform of this cluster has a semi-circular eastern edge into which a chultun has been excavated. Two small structure platforms are located along the northern and western sides of the platform. Stone basins were found in the center of the platform and off the northern edge.

Feature Cluster 24. Situated directly to the north of Feature Cluster 23, the more angular basal platform of this feature cluster was built on the western edge of a limestone outcrop. The structural remains of this cluster consist of a roomblock with well-preserved foundation stones, a structure platform, and a chultun. The chultun is located in the northeastern corner of the basal platform. Four stone basin fragments were scattered in the plaza and along the southern edge of the platform.

Feature Cluster 25. Also built on the edge of a limestone outcrop, this basal platform provides the base for three small relatively well-defined chich mounds. In addition, a single chultun with a clearly visible catchment basin was constructed in the northeast part of the platform. The interior wall plaster is in an excellent state of preservation. A plaster frog was found modelled on the wall. A stone basin was also found along the eastern edge of the catchment basin.

Feature Cluster 26. Two chich mounds and an alignment of stones form this feature cluster which is located 30m southwest of Feature Cluster 25.

Feature Cluster 27. This L-shaped segment of terracing is 25m in total length. The wall is composed of large limestone boulders.

Feature Cluster 28. Modification of a natural hillslope resulted in four
tiers of terrace platforms in this complex. The upper two platform levels have structures with well-defined foundation alignments. Three chultuns occur on the platform levels: two on the lower levels and one on the upper level. An additional chultun, located approximately 25m west of the terraces, was included in this cluster. A single stone basin fragment was found to the north of the western roomblock.

Feature Cluster 29. The basal platform of this cluster is partially defined by a retaining wall. Two low chich mounds are situated along the north and west edges of the basal platform. There is a chultun in the central plaza space which has a well-defined catchment basin on its east and south sides. Off the southwest corner of the platform there is a sascabera.

Feature Cluster 30. This cluster is devoid of any structural remains. It consists of two sascaberas and one possible chultun which was excavated through the center of a limestone outcrop.

Feature Cluster 31. This cluster of chich mounds is located on the highest topographic spot surveyed during the 1983 field season. There are nine chich mounds in this cluster and 35m of terrace retaining wall segments.

Feature Cluster 32. Due to its location outside of the survey grid, this cluster was only sketched. It is located on a hilltop which has been modified into a level surface with platform corners. There are three structures, two with cut stones present, and two chultuns in the cluster.

THE SOUTH-CENTRAL SURVEY ZONE (ZACATE BURN)

Intensive survey of this zone was undertaken in response to a fire in an area of dry zacate grass. The accidental burning of this zacate field proved quite fortuitous to the project's mapping efforts. With the
vegetation burned down to the ground, it was possible to see features and even complete structures which might not be visible in areas cleared by machete and axe. The burned zone covered an area of roughly 70,000m², mostly to the north and west of the stelae platform. Within the zone we located 23 feature clusters, many of which do not appear on the original 1934 Shook map. These clusters range from very low structures of not more than 10-15cm in height to substantial platforms. Artificial filling-in or extension of natural rock outcrops also was observed. In addition, on structures shown on the original site map, many new features such as doorways, rooms, and low support platforms were visible. Large concentrations of potsherds were seen throughout the burned zone, too, as were many stone basins, both shallow and deep, and two mano fragments. In sum, the zacate burn permitted a glimpse of settlement detail, both on and between structures, which was certainly unexpected but definitely serendipitous. The complexity of settlement in the burn zone supports suggestions of patterning revealed in the western transect survey but also stands as a cautionary warning about how much detail can be missed in normal clearing and mapping operations in Yucatan.

DESCRIPTION OF FEATURE CLUSTERS IN THE SOUTH-CENTRAL SURVEY ZONE

After an initial exploration of the zone, we decided to (1) tie-in previously mapped structures with a transit traverse, (2) render in finer detail the features on the previously mapped platforms, and (3) map all previously unmapped structures. As noted, the survey examined twenty-three feature clusters. Six of the clusters (F, I, L, M, O, Q) had been mapped by Shook in sufficient detail and were simply reconnoitered and tied-in to the survey; five of these six clusters had standing architecture.
Architectural detail was added to five clusters (D, N, P, T, U); four of these five clusters had no standing architecture, but foundation walls were clearly visible and so we were able to replace the dashed lines plotted on the original site map. A subsidiary basal platform was added to the east side of cluster N. Twelve new clusters were added to the map. Eight of these new clusters were small chich mounds, many of which had clearly defined sides (A, B, C, H, J, K, S, V); three of them contained basal platforms with foundation walls for superstructures (E, G, W); and one was a substantial basal platform with several building platforms, one of which had stone walls (Feature Cluster R). Metric data on feature clusters are presented in Table 2.

Feature Clusters A, B, and C. These three clusters consist of low chich mounds in the northeast corner of the survey zone.

Feature Cluster D. This cluster was previously mapped, but details of the foundation of a two-room structure and a group of stone basins off the east side of the low basal platform were added. A chultun is present in the northeast corner of the platform.

Feature Cluster E. An intermittent boulder retaining wall lines the west side of this large basal platform. Perched on the eastern edge of a limestone outcrop, this platform is essentially devoid of any other features. A chultun with a stone arc defining the downslope side of the catchment area is located at the base of the outcrop to the east of the platform. Another chultun is situated to the north of this platform. Additional features to the north and west of this chultun were reconnoitered but not cleared for mapping. To the east of this second chultun there is a building platform which was constructed on a low basal platform at the northeastern
edge of another limestone outcrop.

**Feature Cluster F.** No additional detail was added to this cluster, which was present on the original site map. It consists of a roomblock with standing walls and three platforms either of chich or foundation stones. A chultun is located in the middle of the plaza. These features were constructed on a low basal platform.

**Feature Cluster G.** This small basal platform contains a foundation alignment for one or possibly two rooms.

**Feature Cluster H.** Retaining walls outline this rectangular basal platform which contains two chultuns, a low chich mound, and a dense scatter of ceramics. The north wall of the platform is bisected by a sascabera; there is a second sascabera immediately off the northeast corner of the platform. A long, narrow poorly-defined chich mound projects off the east side of the main platform.

**Feature Cluster I.** Present on the original site map, this large cluster of seven roomblocks (all with standing walls) and two structure platforms was constructed on a rambling L-shaped platform with four chultuns. No additional detail was added to the map except to note the location of two stone basins on the south side of the roomblocks.

**Feature Cluster J.** This chich platform was built around a limestone outcrop. Remnants of stone alignments are present on the top of the platform.

**Feature Cluster K.** This is an extremely low chich platform with no associated features.

**Feature Cluster L.** This large basal platform was previously mapped and no additional detail was added. The entire basal platform supports three roomblocks with standing architecture, two structure platforms, and six chultuns. The portion of the basal platform which is devoid of all features except for
a chultun occurs in the burned area; the rest of the platform was under bush. Feature Cluster M. Previously mapped, no additional detail was added to this cluster of three stone-walled roomblocks arranged around a central plaza space. Two structure platforms are present on the southwest corner of the platform, and there is a chultun in the lower level of the basal platform.

Feature Cluster N. Present on the original site map, an additional low subsidiary platform was added to the eastern side of the cluster. The main platform supports one roomblock with stone walls and two roomblocks with foundation walls. All roomblocks face the central plaza area which has a chultun in an excellent state of preservation. Stone basins were found immediately north of the southern roomblock and along the eastern edge of the main platform.

Feature Cluster O. No additional details were added to this previously mapped, uniquely T-shaped building platform on a similarly shaped basal platform. However, it was noted that the building platform on top of the basal platform contained door jambs and a lintel and might have had stone walls. The absence of a chultun is noteworthy in the cluster which is near, but not contiguous, with the sacbe.

Feature Cluster P. This cluster was present on the original site map although it was not mapped in great detail. Of the four platforms originally rendered with dashed lines, three of these have clear foundation walls. The fourth is amorphous. There is a fifth chich mound with well-defined sides (previously unmapped) on the extreme northwest portion of the basal platform. Each of the four clusters of roomblocks has a chultun associated with it. Two of the chultuns have clearly defined stone arcs delimiting the catchment
Feature Cluster Q. This cluster is contiguous with the sacbe. No new details were added to this previously mapped complex. Two roomblocks with stone walls and one structure platform were constructed on top of a low basal platform with a western projection (possibly a staircase). The absence of a chultun is noteworthy.

Feature Cluster R. Not previously mapped, this cluster has an exceptionally high ratio of chultuns to basal platform area. Two of the three chultuns have stone arcs delimiting the downslope side of the drainage net. Five structures were built on the basal platform: one with stone walls, one with a foundation alignment, and three chich mounds. There is a concentration of stone basins in the southwest corner of the platform and on the terraced slope south of the platform.

Feature Cluster S. This is a small chich mound with no associated features.

Feature Cluster T. A dashed rectangle on the original map marks the location of clusters T and U. These two clusters are separated by a limestone depression. A boulder alignment defines the northern and eastern sides of the basal platform of T. There are three room foundations and a small structure platform situated on this basal platform. Two chultuns are located close to the rooms, and two stone basins were found in a small plaza area in front of the rooms.

Feature Cluster U. Situated only 15m east of the stelae platform, this cluster consists of two foundations for perishable structures which occur on a very low and poorly defined basal platform. A single stone basin was found north of the western foundation.

Feature Cluster V. This feature is a limestone outcrop which has been leveled by the addition of chich to form a platform area.
Feature Cluster W. This cluster lies within 15m of the northeastern corner of the extraordinarily large platform associated with the Southern Palace. Retaining walls define the eastern and western sides of this trapezoidal basal platform. Foundation stones for a one-room structure and a chultun are the platform features. A stone basin fragment was found off the north end of the platform.

ANALYSIS OF FEATURE CLASSES

In this section the variability of basal platforms, superstructures, chich mounds, chultuns, and stone basins is discussed. Some of the variables thought to condition this variability are briefly analyzed and preliminary contrasts and similarities between the two survey zones are noted. The reasons for the variability obviously will be one focus of our proposed research.

Basal Platforms. Unlike other lowland Maya settlements in which a sizeable percentage of residential mound groupings are constructed at ground level without a basal platform, the majority of feature clusters at Sayil have superstructures resting on basal platforms, although some of the chich mounds are exceptions to this pattern. However, the basal platforms at Sayil were not simply a technique to raise the height of the structures but rather were contoured surfaces which provided a catchment area for the chultuns. Additionally, the constricted neck of the chultun was constructed in the platform gravels rather than out of bedrock.

Basal platform areas were calculated (using a digital planimeter) for the Western Transect and South-Central Zone. Platform area in the Western Transect ranges from less than 100 to 1700m²; the size range is broader
in the South-Central zone, ranging from less than 100 to 3500m$^2$. We found that wall structures tend to be associated with the larger platforms (all platforms over 1350m$^2$ have standing architecture); however, standing architecture occurs on platforms of almost all sizes down to 500m$^2$. Overall, there appears to be more clumping towards the lower end of the spectrum in the Western Transect, although 50% of the platforms, in both areas, are under 500m$^2$. As might be expected, there is a strong correlation between total platform size and number of rooms ($r=0.84$) which was pointed out to us by R. Santley (personal communication).

Due to the perceived function of the basal platform surface as a drainage net for chultuns, it was suggested that the ratio of open platform space to platform area covered by superstructures might be inflated for Sayil compared to other sites. We found that 71% of the platforms have less than 16% of their surface area covered by superstructures. The mode for the Western Transect is 6-8%, while that for the South-Central is slightly higher at 8-10%. We plan to build a comparative base for other parts of the Maya lowlands so that our figures can be compared with other sites.

Buildings. In order to determine whether there is significant variability in room size, both between survey zones and between classes of structures (with stone walls or foundations only), the mean room size per roomblock was graphed (Figure 6). Visual examination of the map suggested that there was very little variability in room size within a roomblock and that variability from roomblock to roomblock was more significant. Clearly, mean room size is smaller for structures with footing walls (wall foundations) in both areas. The graphs appear to have normal distributions except for the right tail on the distribution of structures with footing walls in the South-
Central survey zone. This distribution suggests that some of these exceptionally large structures, located close to the stelae platform and South Palace, may not be residential in function. More rooms with standing walls were encountered in the South-Central survey zone, perhaps due to its central location, although mean room size is slightly smaller than rooms with standing walls in the Western Transect. In both classes of structures, the spread of size distribution is greater in the South-Central survey area. The Western Transect appears as a subset of the variability in structure sizes in the South-Central zone. This result correlates well with the greater variability in basal platform area in the South-Central survey zone. It should be noted, however, that sample size is larger in the latter.

Chich Mounds. A separate analysis (using the same size scale) was performed on the chich mounds (Figure 7). Only mounds which were not located on top of basal platforms and did not have retaining walls were included in this sample. We found, first, that there are many more chich mounds in the Western Transect. Second, the clumped distribution of chich size is bi-modal with 70% of the mounds measuring 16m² or smaller. Mound sizes peak at 4-6m² and 12-16m². Third, there is a clear inverse correlation between chich mounds and chultuns.

Architectural Variability in the Western Transect. Within 80m west of the sacbe there is a dramatic drop-off in standing architecture and beyond 300m no such stone walled structures were encountered. In addition, the number of rooms with foundation alignments slowly decreased with increasing distance from the site center. However, the chich mounds increase in number with increasing distance from the site center. So, the variables conditioning the size and spatial distribution of the chich mounds appear to be distinct
from those acting upon the foundation and stone wall structure classes.

Chultuns. What is conditioning the location and density of chultuns? Barrera Rubio (1978) suggested that chultun density may be correlated with architectural elaboration. While the preliminary Sayil data do not indicate a strong correlation between numbers of rooms with standing architecture and number of chultuns \( r=0.4 \), they do point to a positive relationship between platform size (area) and number of chultuns \( r=0.6 \). When this latter relationship was graphed on a scattergram (Figure 8), an incremental, or stepped, increase in the number of chultuns clearly emerged. That is, platforms up to \( 400 \text{m}^2 \) had no more than one chultun, platforms from 400 to \( 1000 \text{m}^2 \) have two or fewer chultuns, and platforms from 1000 up to \( 2000 \text{m}^2 \) have three or fewer chultuns. The only exception to this pattern is Feature Cluster R in the South-Central survey zone. This platform is relatively small yet it houses three chultuns.

The pattern of increments in platform size correlating with increased number of chultuns suggest that there might have been platform size specifications or thresholds (a possible rule of planning and design) governing the number of chultuns and that chultuns could not be added to an existing platform in a casual manner.

An additional analysis performed on this scattergram indicated that the largest platforms with the most chultuns consistently have standing architecture and that even though the presence of standing architecture is not as powerful a predictor of chultuns as is basal platform size, large platforms with standing architecture do tend to have the most chultuns.

Perhaps examination of some of the exceptions to this pattern will provide us with insights to the functional variability among structures.
Examining the structures with standing architecture and no chultuns, it is potentially provocative that the two largest platforms in this category (Feature Clusters 1 and Q) are situated immediately contiguous to the sacbe at the north and south extremes of the sacbe respectively. This correlation suggests that these features may have non-residential functions.

Feature Cluster 10 is truly anomalous. It is possible that the depression in the northeast corner of the platform is really a chultun that has collapsed and filled.

There are only two Feature Clusters with footing walls and no chultuns: G and U. While G is an extremely small platform, U is the feature closest to the stelae platform (less than 20m distant). Once again, this locational information suggests the possibility of a non-residential function for Feature Cluster U.

Stone Basins. Stone basins are features (artifacts) which are ubiquitous on Puuc sites yet somewhat enigmatic in terms of function. As noted in the description of the feature clusters, these basins tend to occur in open plaza spaces, in front of doorways, or on terrace or platform edges. When complete, these basins range from 50-65cm in length, 30-60cm in width, and 23-45cm in height. However, the variability in the morphology and depth of interior surface is what is of interest here. Many of the basins have very steep interior sides with very flat bottoms. Depths of 18-28cm are very common. Other basins have more gently sloping trough-like sides and are less than 10cm deep (what are traditionally labelled as metates). The interior surfaces of the basins are generally quite eroded, so that difference in patterns of surface wear cannot be studied on materials currently available.

Basically, the very deep basins not only appear to be too deep to be
used as metates, but the interior shape of the basins is not designed to accommodate the mechanics of grinding with a mano. If the very deep basins were simply exhausted metates then we would expect a histogram of basin depths to have a normal distribution with a few new metates being quite shallow, many metates in their prime use stage with an intermediate depth, and a few deep metates which somehow survived breakage. However, in studying basin depth, it was discovered that basin depths had a multi-modal distribution with a tendency for basin depth to be either between 6-14cm or 20-26cm and a small number of deeper basins trailing off to the right (Figure 9). The low frequency of basins between 14-20cm deep suggests that there is a real functional difference between the shallow and deep basins, although it remains to be proven what these functions were (they could simply be different kinds of grinding, for example). As noted earlier, microscopic examination of the surfaces of non-eroded specimens (if they can be found) would be crucial in this regard.

Aguadas. In addition to the numerous chultuns, two possible aguadas (reservoirs) were located in the northeast part of the central zone. Clearly, the possible functions of these features need to be tested. It is probable that there were other aguadas, yet to be identified, since large quantities of water would have been needed for personal consumption as well as the huge amount of construction at the site. However, the latter may well have been undertaken in the rainy season (E. Kurjack, personal communication).

Summary. Nearly 50 years ago, Pollock (1935:125) perspicaciously observed:

It is...interesting to note that a region (the Puuc) which probably harbors more known remains than any other area in Yucatan appears to be the most fertile agricultural region in the peninsula; also that due to an almost complete absence of natural water supply the inhabitants resorted to the
artificial storage of rain water in underground cisterns known as chultuns, and that great numbers of specialized, platform-like structures were created for this purpose.

Our preliminary exploration of Sayil's settlement not only confirms Pollock's observation, but indicates more generally that the settlement pattern at Sayil was governed to a significant extent by the need to collect and store water.
ACKNOWLEDGMENTS

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TABLE 2. Feature Clusters in the South-Central Survey Zone (con't.)

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Figure 1. The location of Sayil.
Figure 2. Idealized cross-section of a Sayil residential unit with basal platform constructed over limestone bedrock.
Figure 3. Locations of the two 1983 survey zones at Sayil.
Figure 6. Size distribution of mean room area for structures with stone walls and footing walls.
Figure 7. Size distribution of chich mounds.
Figure 8. A scattergram relating number of chultuns to local platform size.
Figure 9. Size distribution of interior depths of stone basins.