83

CERAMIC COMPLEXES, PERCENTAGES ANDCONTEXT FORMATION: CONSIDERATIONS ABOUT THE DATING OF MAYA BUILDINGS

Eduardo Pérez de Heredia

Keywords: Maya archaeology, Mexico, Yucatan, Chichen Itza, dating, ceramic analysis, Initial Series Group, seriation, garbage pits

"There is an issue around which all archaeologists concur, and this is the importance of chronology" (Dean 1989:373).

This article integrates a wider work aimed at establishing a chronologic ceramic sequence for Chichen Itza, using the chronological components of the ceramic contexts in order to achieve an orderly sequence of the processes of occupation, construction and development of the site, as well as of the processes of abandonment and reoccupation. The main thesis we are attempting to prove is that the distribution of the chronologic components of a ceramic context defines the refining of the temporal positioning of such context.

Ceramics are greatly important in the dating of prehispanic Maya buildings due to the habit of this culture to integrate them into their construction refills. For this reason, the architectural, sculptural and epigraphic sequences may be joined together to the ceramic sequence, and furthermore, to absolute dates, to provide a temporal framework for its ancient history.

Often times, there is some dependency on the ceramic dating (for example, when there are no epigraphic or absolute dates, or architecture is severely damaged) to date Maya buildings. When all other indicators fail, ceramic is always there to chronologically situate the structure. For this reason, it is important to make progress in defining stages of shorter temporalities, or at least, to facilitate the definition of facets within such stages. This work will try to demonstrate that the theory of context formation may be of some help to establish more accurate chronological ceramic sequences.

For the time being, we are presenting several considerations that have arisen during our work with the Chichen Itza ceramics. Far from being in a position to offer regularities and constants at this time, we wish to elaborate on several concerns and ideas that may be of relevance in the path we are now following.

CERAMIC COMPLEXES

The complexes are defined as the total sum of ceramic units which altogether constitute an interval at any specific site or region (Smith and Gifford 1965:502; Willey, Culbert and Adams 1967:304). *"A ceramic complex comprises the total amount of ceramics and attributes that can be associated with a discrete and easily distinguishable assemblage, with a specific geographic localization and in a fixed chronological period of time. In theory, at least, its extension in space must be limited and its temporal duration, brief"* (Gifford 1976: 11-12).

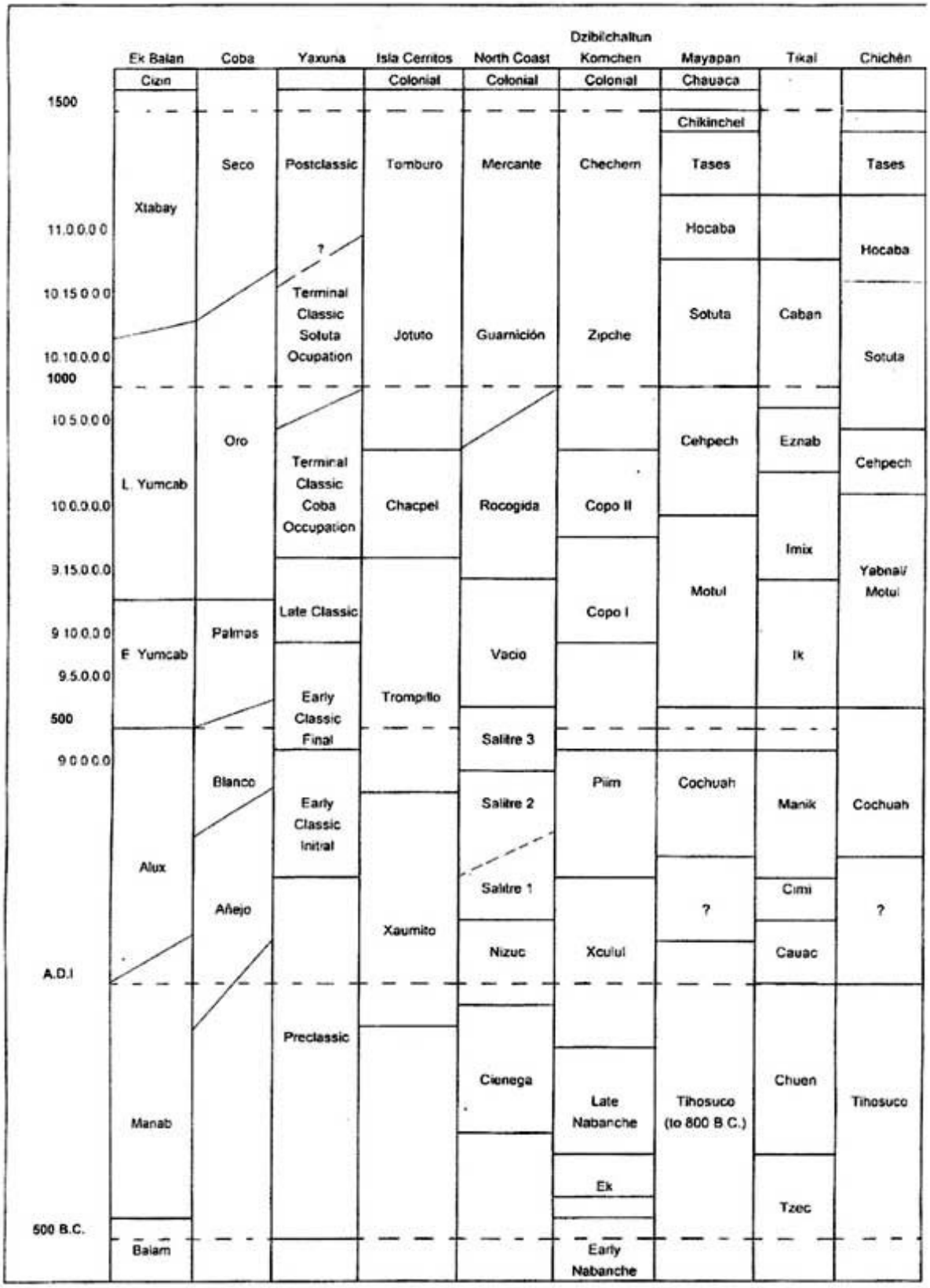

Figure 1. Comparative chart of chronologies for the Maya area.

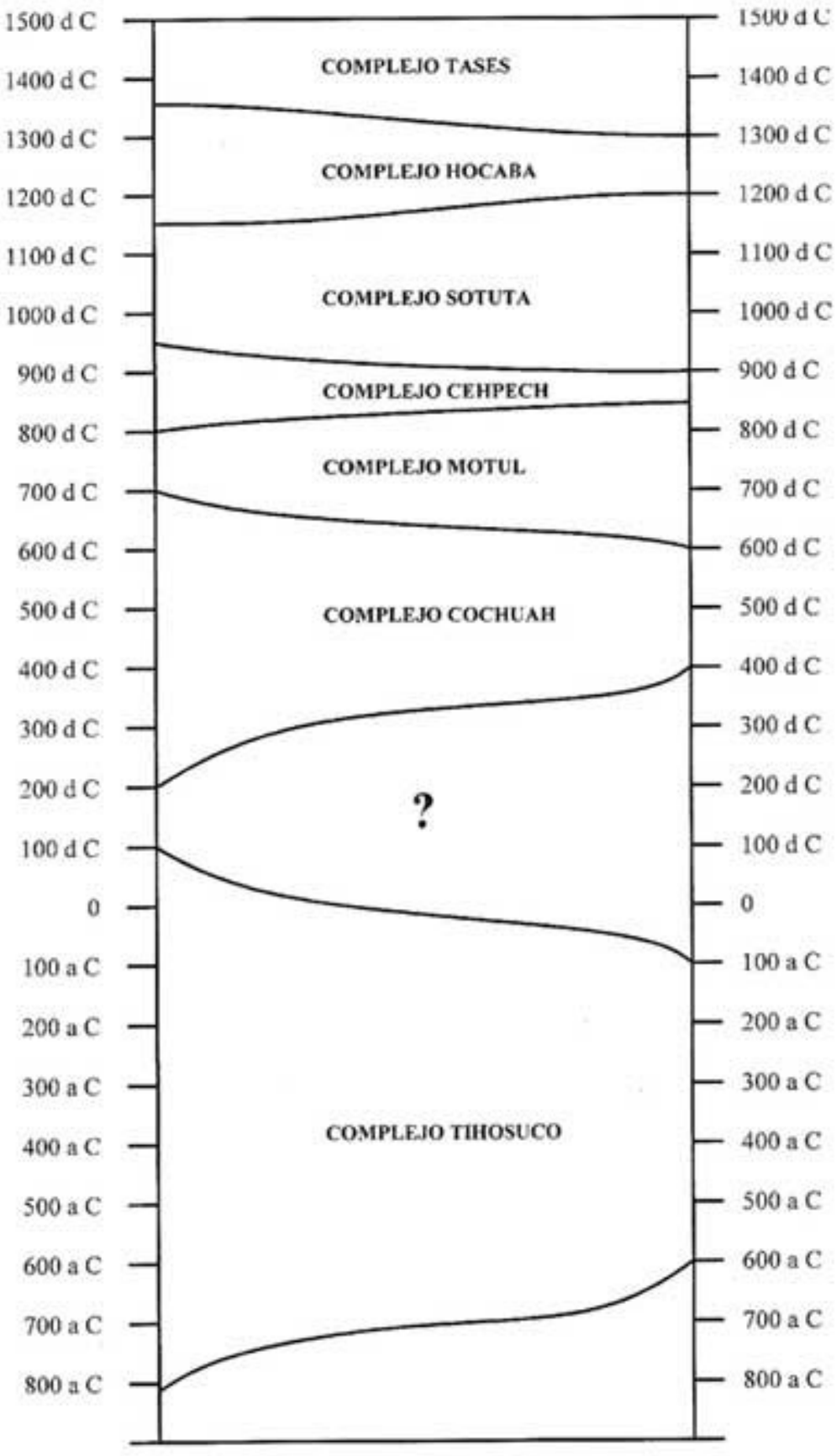

Figure 2. Ceramic complexes at Chichen Itza.

It is usually assumed that complexes are theoretical constructions that represent periods in the ceramic production, basically equivalent to the periods of use of that particular ceramic. Nonetheless, this should not be assumed as a law, inasmuch as the use of the ceramics from some particular context may extend beyond their temporal frame of production. A clear example of this are the infant burials in vessels found at the Initial Series Group (see Pérez de Heredia et al., this volume).

One major problem is that these complexes are rarely reflected with accuracy in archaeological contexts, as in most cases the excavated archaeological contexts reveal the occurrence of several ceramic complexes.

In such occasions, the most recent sherd is the one considered adequate to date the context (Orton et al. 1993:187). Despite its usefulness, this occasionally leads to over-simplifying the ceramic classification, and to fixing the contexts in pre-established chronological pigeonholes without paying too much attention to the rest of the fragments.

THE GRAPHIC REPRESENTATION OF CERAMIC COMPLEXES

It often happens that ceramic sequences are represented as a succession of complexes divided by horizontal lines, whenever substitution is to be denoted, or diagonal lines whenever more gradual transitions are to be represented. Other times, when the separation between two complexes is not accurately established, discontinued lines appear to be the best option for representation (Figure 1).

No doubt, the type of representation used influences one way or the other the conception of the ceramic under study and its temporal divisions, and may create unnecessary biases and even wrong interpretations.

In this study we have decided to use a representation based on curved lines, for they reflect better the reality of ceramic complexes (Figure 2). Representations with curved lines allows for some degree of overlapping among complexes, and subsequently, for the chronological positioning of contexts (Figure 2). This is achieved by using the percentages of the two more recent complexes.

To this purpose, we are starting from hypothetical bases. One such example: complexes X and Y, where X is earlier and Y is more recent (Figure 3).

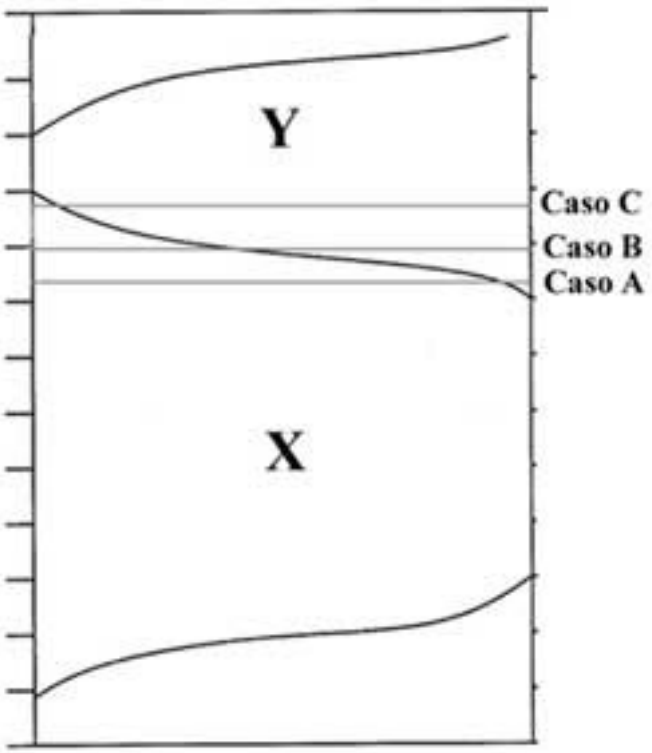

Figure 3. Context positioning: Cases A, B and C.

- Case A: a context created at the beginning of complex Y will have less than 25% of materials from the Y complex, and high percentages of the X complex.

- Case B: in turn, a context created halfway through complex Y, will contain more ceramics from the Y complex than in the previous case, perhaps 25% to 75%, and a lower percentage from the previous complex.

- Case C: finally, if the context was created around the end of complex Y, the ceramic percentage of this complex will exceed 75%, and the percentage of complex X will be minimal.

Thus, the use of the percentages of the two more recent complexes in a curve chart allows for more accurately framing a context within the ceramic sequence. By starting with a minimal precision in the early, middle and late facets, the complexes from northern Yucatan –of approximately 200 years each- may be refined in facets of approximately 70 years each, which means a significant progress. A seriation may thus be obtained, which in any case will require “fixed points”, feasible to obtain through other lines of evidence.

At Chichen, the presence of hieroglyphic dates and the clear differences in architectural style are combined with the –still scarce and controversial- C14 dates, to provide these “anchorages” or “fixed points” with which the seriation is to be positioned. In a diagram designed with curves, it is necessary to specify whether these “anchorages” correspond to the left end, the right end, or the middle of the curve.

Nonetheless, the positioning of the contexts cannot be all the mechanical we have suggested above, as practical issues regarding the dating theory and the theory of context formation to be applied in each particular case should also be considered. As an example, a platform refill contains ceramic materials originated in garbage pits or debris accumulations. The ceramic percentages in this case will date the formation of the dumpster, but not necessarily the construction of the platform. Besides, as we shall see later, several other factors will have an influence to make dating a complicated matter.

CERAMIC DATING AND CONTEXT FORMATION

A number of ideas shall be presented, which could be applied to the dating of ceramic contexts.

The first suggests that fine and imported wares enter at a later date in archaeological contexts. Hayden and Cannon (1983:126) suggest that "value" influences the treatment of wastes. Fine or "valuable" wares are given a special care, and are more frequently repaired than common wares. For this reason, it is suggested that a context with a high percentage of fragments of "valuable" wares (fine and/or imported), most probably corresponds to a late facet of that complex.

This seems to be corroborated in one example at Chichen Itza. In the Complex of the Phalluses, the floor corresponding to the construction of the Dancing Jaguars building was excavated. This building rests on the second level, and is accessed through a stairway associated with the laying of the last floor, or final modification of this complex (Osorio 2004). For this reason, this is one of the last construction contexts of the Initial Series Group. The ceramic analysis of this floor shows a high percentage of "valuable" ceramics represented by the Dzibiac Red, Silho Fine Orange, Tohil Plumbate, Tinum Red on Buff, and Xcalacoop Brown wares. Table 1 shows the percentages of wares in this context. "Common" wares, Sisal and Dzitas, add up both to 57% of the total, while the "valuable" wares (Dzibiac, Silho, Tohil and Tinum), represent 42%. This is a very high percentage for these wares, when compared to examples from other parts of the site.

TABLE 1
FINAL FLOOR FROM THE PHALLUS COMPLEX

WARES	SHERDS	
Sisal Unslipped	187	23.20%
Dzitas Slate	279	34.61%
Dzibiac Red	230	28.53%
Silho Fine Orange	43	5.33%
Tohil Plumbate	17	2.10%
Tinum Red on Buff	39	4.83%
Xcalacoop Brown	11	1.36%
TOTAL	806	

Actually, the percentages of the “valuable” wares are much lower at other Chichen Itza contexts, such as those from *Sacbe* 1 and the Northeast Colonnade, shown in Tables 2 and 3. It is necessary to mention that the three contexts presented correspond to elite areas, and that rank differences are not considered to be the cause of these disparities. On the contrary, even at *Sacbe* 1 and the Northeast Colonnade there are rather elevated percentages of “valuable” wares, when compared to other contexts at the site.

TABLE 2
SACBE 1, PROBE 7

WARE	**SHERDS**	
Sisal Unslipped	5043	43.9%
Dzitas Slate	5202	45.3%
Dzibiac Red	1114	9.7%
Silho Fine Orange	35	0.3%
Tohil Plumbate	34	0.3%
Tinum Red on Buff	32	0.3%
Libre Unión	22	0.2%
TOTAL	**11482**	

TABLE 3
REJOLLADA OF THE NORTHEAST COLONNADE

WARE	**SHERDS**	
Sisal Unslipped	12815	58.7%
Dzitas Slate	6544	30.0%
Dzibiac Red	1826	8.4%
Silho Fine Orange	406	1.9%
Tohil Plumbate	61	0.3%
Tinum Red on Buff	96	0.4%
Libre Union	31	0.1%
Xcalacoop Brown	66	0.3%
TOTAL	**21845**	

The opposite case is represented by the “coarse” wares. It is considered that the coarse wares, with no slip, domestic, used mostly to cook the meals, would be included in archaeological contexts earlier in time. This could be due to the fact that objects with a low value and a high degree of hindrance were cleaned and quickly disposed of (Schiffer 1987:67).

Therefore, coarse wares are greatly valuable for the identification of early facets of transition between complexes. Unfortunately, and because of their poor or inexistent decoration, these wares are not easily distinguished, and at times, the coarse wares of two different complexes are very similar and this hinders taking any advantage of their possible value for dating.

STRATIGRAPHIC PITS AND THEIR DATING

Usually, when buildings and platforms are to be dated, a stratigraphic pit is excavated, and it is assumed that their ceramic contents are homogeneous enough to allow for their positioning in the ceramic sequence. Nonetheless, several examples observed at Chichen Itza lead to being less optimistic in this respect. For example, two pits excavated in the platform of Structure 5C2, show disturbing discrepancies (Tables 4 and 5).

TABLE 4
PIT 1 EXCAVATED IN THE PLATFORM OF STRUCTURE 5C2

	SHERDS	
Tihosuco Complex	1	0.20%
Motul Complex	58	12.83%
Sotuta Complex	420	87.13%
Unassigned	3	0.62%
TOTAL SHERDS	**482**	

TABLE 5
PIT 2 EXCAVATED IN THE PLATFORM OF STRUCTURE 5C2

SUMMARY PER CERAMIC COMPLEX
SHERDS

Motul Complex	135	49.81%
Cehpech Complex	33	12.17%
Sotuta Complex	88	32.47%
Unassigned	15	5.53%
TOTAL SHERDS	**271**	

In fact, if there is only Pit 1 to date platform 5C2, the most logic positioning would correspond to a late facet of the Sotuta complex (represented by 87%, and the absence of the preceding Cehpech complex), while if there was only Pit 2, the positioning would fall at the beginning of the Sotuta complex (represented with 32%, and the occurrence of 13% of the preceding Cehpech complex).

One quite possible reason for this difference in contents would be the following. The garbage pits are used as platform refills. Whenever a garbage pit contains ceramics from two different time frames, the more recent one is the most superficial one, and therefore the first to be taken to the new construction, with sound possibilities that it ends up concentrated in one part of the refill. This gets even worse when several garbage pits from different time frames are used in a refill, and their content not always is scattered in a homogeneous manner. And even worse, occasionally, the construction of platforms and terraces includes the use of “refilling cells” that may additionally contribute to the lack of homogeneity in the dispersion of ceramics within one platform.

Therefore, it is necessary to confirm the information of the stratigraphic pits and to obtain the largest possible samples, so that temporal positioning becomes more reliable. Whenever this is not possible, the chronological inferences will demand an extra dose of caution.

There is a second case where the dating of a terrace shows major discrepancies, depending on where the test pits are excavated. At the Main Plaza of the Initial Series Group an alignment that defines the end of the platform that supported the buildings of the Late Classic Motul complex (Figure 4) was detected. Three pits excavated immediately outside the Motul platform revealed a dumpster of the Cehpech complex, in that which possibly constitutes the most important example of this ceramic at Chichen Itza found until now (Table 6, Figure). Therefore, the expansion of the platform must be dated to the Cehpech complex.

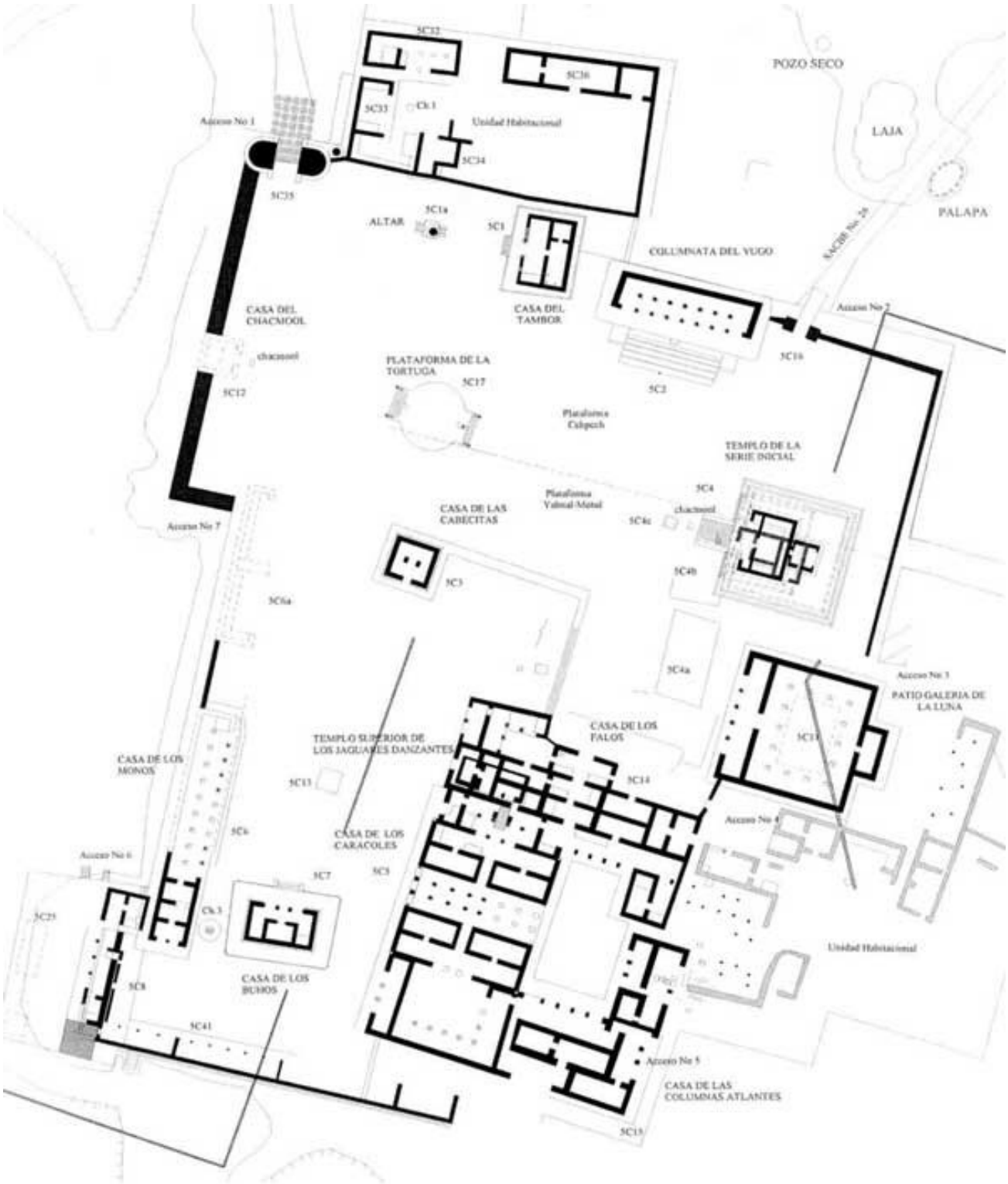

Figure 4. Ground plan of the Initial Series Group.

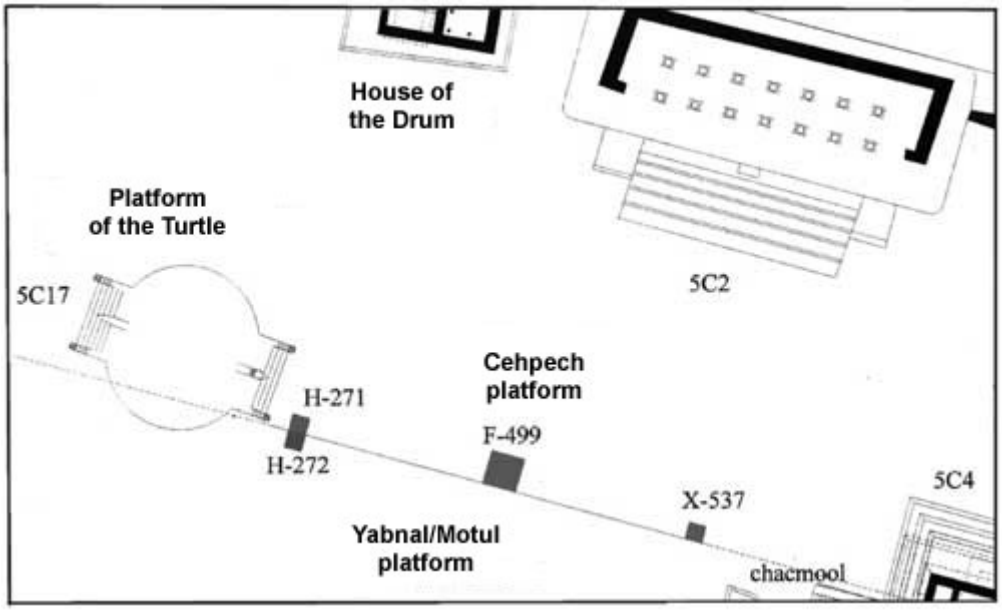

Figure 5. Location of pits at the main plaza. Initial Series Group.

However, several pits excavated further north show a pure content of the Motul complex (Table 7). In our view, the reason for this behaviour is due to the fact that the expansion of the platform was accomplished at the beginning of the Cehpech complex. This is why the platform covered the Cehpech dumpster that was being formed, while the rest of the platform was refilled with garbage from the preceding complex.

TABLE 6
MAIN PLAZA, INITIAL SERIES GROUP
CENTRAL PIT, OUTSIDE THE MOTUL PLATFORM, LAYER III

	SHERDS	
Tihosuco complex	1	0.58%
Motul complex	16	9.35%
Cehpech complex	152	88.88%
Unassigned	2	1.16%
TOTAL SHERDS	**171**	

TABLE 7
BURIALS AREA
LAYER IV, LOT X-303-IV

	SHERDS	
Tihosuco complex	1	0.8%
Motul complex	125	99.2%
TOTAL SHERDS	**126**	

FORMATION OF DUMPSTERS (SECONDARY REFUSE DEPOSITS)

If the ceramic contents of the construction refills come from garbage pits, then the need arises to excavate the garbage pits with a greater care, to achieve a better understanding of their formation. In this way, regularities will be found which will allow for establishing rules and formation laws for these garbage deposits, and ultimately to help for their more accurate chronological positioning.

In this respect, it is important to answer the question on whether this is a garbage deposit that was formed gradually, through many depositing events, or if on the contrary we are in front of a sudden formation that took place in one or just a few events. The usual answer is that they may have been formed through termination rituals, or as a consequence of events involving violence.

Joseph Ball, in the specific case of the Sacred Cenote, and without elaborating on the reasons of his arguing, states that *"the apparent ceremonial functional homogeneity and the formal redundancy of the late Postclassic pottery is consistent with the archaeological pattern expected as a result of an episode temporally discrete of repetitive rituals of offerings made formal in the Sacred Cenote"* (Ball and Ladd 1992).

Even though in the specific case mentioned by Ball we feel that his point of view is correct, we also believe that more than on functional homogeneity or formal redundancy, we should further concentrate on the analysis of vessel parts:

- As suggested, the artifacts considered to have a certain value as materials, such as broken vessels, were kept at hand for extended periods of time, frequently in areas of provisional disposal, as a consequence of their potential for future use (Hayden and Cannon 1983:131).

- The parts that usually were used after the piece was broken were the bottoms (still usable as containers), followed by handles and necks (large bodies were also very useful for lids).

- This would imply that a garbage deposit formed gradually (like a deposit of secondary refuses) will receive a small number of bottoms (which are more frequently reused or kept in special areas), and that a garbage deposit formed all of a sudden will have a greater percentage of these parts.

- Moreover, the capability of fragments to be reassembled to form vessels will be higher in dumpsters formed suddenly than in the gradually formed ones.

EXCAVATION TECHNIQUES AND THEIR INFLUENCE ON DATINGS

Finally, we should ask ourselves what is the real influence of the excavation techniques in the understanding of ceramics. We are now presenting an example that shows the discrepancies observed between the ceramic materials recovered

during the process of excavation and those obtained during the process of sifting or screening the excavated sediment. Given the fact that in some archaeological projects the sieve is only selectively used, it is important to clarify whether the sifting activity has any influence on the results of the ceramic analysis or not.

The context selected for this experiment was the dumpster (secondary refuse deposit) detected at the back of the Building of the Monkeys, in the Initial Series Group, outside the platform that supports this building (Figure 4). The ceramic recovered during the excavation was sorted and counted separately from the ceramic recovered with the sieve. In the excavation, over 4000 sherds were recovered, while the sieve yielded 9000. As anticipated, the fragments in the sieve were consistently smaller than those recovered in the excavation.

Tables 8 and 9 show respectively the percentages of the ceramic complexes in both operations. As may be observed, the percentages of the best represented complexes hardly show any difference (for example, the Sotuta complex varies from 96% in one excavation, to 97% in the screen). However, in the sieve, there are two represented complexes (Tihosuco and Cochuah) that are absent in the excavation material. Both complexes are represented by one single sherd each.

TABLE 8
GARBAGE DEPOSIT AT THE BUILDING OF THE MONKEYS – CERAMIC OBTAINED DURING THE EXCAVATION

	SHERDS	
Motul complex	49	1.14%
Sotuta complex	4148	96.00%
Hocaba complex	107	2.48%
Tases complex	15	0.35%
Unassigned	2	0.05%
TOTAL SHERDS	**4321**	

TABLE 9
GARBAGE PIT AT THE BUILDING OF THE MONKEYS – CERAMIC OBTAINED WITH THE SIEVE

	SHERDS	
Tihosuco complex	1	0.02%
Cochuah complex	1	0.02%
Motul complex	70	0.78%
Sotuta complex	8753	97.18%
Hocaba complex	180	2.00%
Tases complex	1	0.02%
Unassigned	1	0.02%
TOTAL SHERDS	**9007**	

Nevertheless, if at the complex level discrepancies are not too important, at the type level, differences are more significant. Charts 10 and 11 show the results of the unslipped vessel types of the Sotuta complex, the best one represented in this garbage deposit. While in the excavation (Table 10) the Sisal Unslipped type represents 71% of the ware, the Piste Fluted type hardly adds up to 23%. These percentages are inverted in the screened material, with 28% of Sisal against 70% of Piste. The relevance of this difference resides in the fact that Sisal Unslipped is largely formed by censers and incense burners of ritual use, while Piste Fluted is formed mainly by domestic jars.

TABLE 10
GARBAGE DEPOSIT, BUILDING OF THE MONKEYS
PERCENTAGES PER TYPES OF UNSLIPPED CERAMIC WARES
RECOVERED IN THE EXCAVATION

	SHERDS	
Chichen unslipped ware	1140	
Sisal unslipped type, Sisal variety	819	71.8%
Piste fluted type, Piste variety	274	24.0%
Espita appliqué type, Espita variety	32	
Cumptun composite type, Cumtun variety	15	

TABLE 11
GARBAGE DEPOSIT, BUILDING OF THE MONKEYS
PERCENTAGES PER TYPES OF UNSLIPPED CERAMIC WARES
RECOVERED WITH THE SIEVE

	SHERDS	
Chichen unslipped ware	5646	
Sisal unslipped type, Sisal variety	1610	28.5%
Piste fluted type, Piste variety	3959	70.1%
Espita appliqué type, Espita variety	63	
Cumtun composite type, Cumtun variety	14	

It should be noted that such an inversion of percentages involved the types Dzitas Slate and Balantun Black on Slate of the Chichen Slate ware, corresponding to the same Sotuta complex.

Finally, it is apparent that some “fine” or “valuable” types of the Tohil Plumbate ware were not represented in the material collected during the excavation, and the number of them dropped considerably, as shown in Tables 12 and 13.

Thus, it would seem that the use of the sieve affects the studies on functionality to a larger degree than the studies on chronology. However, and apparently, the screening of materials is seen as a necessity in all excavation contexts. If this is so, we can only imagine the alterations that practices such as the selection of sherds in the field may cause on the final results of the analyses.

Furthermore, the amount of small non-ceramic features found in the sieve in this little experiment conducted at the Building of the Monkeys was higher than the amount found during the excavation process.

TABLE 12
GARBAGE DEPOSIT, BUILDING OF THE MONKEYS
PERCENTAGES OF THE TYPES OF THE TOHIL PLUMBATE CERAMIC WARE RECOVERED IN THE EXCAVATION

	SHERDS
Tohil Plumbate ware	5
Tohil Plumbate type, Tohil variety	3
Tumbador Incised type, Tumbador variety	1
Malacatan Modeled type, Malacatan variety	1

TABLE 13
GARBAGE DEPOSIT, BUILDING OF THE MONKEYS
PERCENTAGES OF THE TYPES OF THE TOHIL PLUMBATE CERAMIC WARE RECOVERED WITH THE SIEVE

	SHERDS
Tohil Plumbate ware	22
Tohil Plumbate type, Tohil variety	15
Another Tohil Plumbate type, painted (?)	2
Tumbador Incised type, Tumbador variety	3
Malacatan Modeled type, Malacatan variety	1
Porvenir Gadrooned type, Porvenir variety	1

CONCLUSIONS

There are a number of cases involving the dating of buildings and platforms that were applied to Chichen Itza. Even though no one may expect ceramic dating to be absolutely accurate, the most obvious conclusion extracted from the material analyzed is that ceramic dating is not all that easy and nor all that simple as one may think. This is due to a number of different factors.

In the first place, it is necessary to carefully observe the formation of the contexts where the ceramics used to date these buildings were originated. A very meticulous excavation of garbage accumulations should be conducted in the future, for a better understanding of this process. Attention towards traits not directly chronological, such as the quality and "value" of the vessels, their breakage condition and their reassembling capacity, as well as the vessel parts represented in the contexts, are some examples that promise to be of help in this attempt.

Although counting the fragments still is the usual technique for ceramic analysis in northern Yucatan, due particularly to the large amounts of this material that were discovered and that hindered any other types of measurements, the possibility of error of this technique is significant, as has already been proved by different authors (Orton et al. 1993:33). Thus, it would be important to establish parameters of comparison with other techniques and for the different wares that may at least allow for refining this understanding.

The dating based on stratigraphic pits may be tricky when only one pit is excavated, and the corroboration of the data by means of additional pits becomes an imperative, particularly when platforms and large structures are involved. Finally, some excavation techniques whose relationship with dating may seem superfluous, for example screening, affect, even if slightly, the dating, and distorts in particular the

percentages of types and vessels, a vital information, for example, in functionality studies.

There is still no basic information on the production, use and distribution of ceramics at Chichen Itza. For the moment, no studies have been made on the duration or "useful life" of the vessels, their replacement frequency, activity areas, disposition modes, trends regarding disposal, etc.

It is important to outline the point of view expressed by Orton et al. (1993:196), in the sense that *"there must be constant feedback between the understanding of exchange patterns, sources, the formation processes of sites, function and chronology. The latter cannot, in no way, be placed in a separate box; it is only one of the factors that monitor variation at the heart of, and between the sites, and cannot be taken separately, without the others".*

ACKNOWLEDGEMENTS

Thanks to J. Schmidt and Sylviane Bouchet. This work was accomplished with a doctoral scholarship granted by La Trobe University, Melbourne.

REFERENCES

Ball, Joseph, and John M. Ladd
1992 *Ceramics in Artifacts from the Cenote of Sacrifice: Chichen Itza, México* (edited by Clemency Chase Coggins), pp. 191-233. Harvard University Press. Peabody Museum, Harvard University, Cambridge.

Dean, Jeffrey S.
1989 Independent Dating in Archaeological Analysis. In *Method and Theory in Archaeology* (edited by Michael Schiffer), Vol. 1, Academic Press.

Gifford, J.C.
1976 Prehistory Pottery Analysis and the Ceramics of Barton Ramie in the Belize Valley. *Memoirs of the Peabody Museum of Archaeology and Ethnology,* Harvard University, Vol. 18, Cambridge.

Orton, Clive, Paul Tyers, and Alan Vince
1993 *Pottery in Archaeology.* Cambridge University Press, Cambridge.

Osorio León, José Francisco
2004 El Conjunto de Los Falos en Chichen Itza: El reflejo de una vida palaciega. In *XVII Simposio de Investigaciones Arqueológicas en Guatemala, 2003* (editado por J.P. Laporte, B. Arroyo, H.L. Escobedo, and H. Mejía), pp. 1025-1034. Museo Nacional de Arqueología y Etnología, Guatemala.

Smith, R.E., and J.C. Gifford
1966 Maya Ceramic Varieties, Types and Wares at Uaxactun. Supplement to *Ceramic Sequence at Uaxactun, Guatemala.* Middle American Research Institute. Tulane University, Pub. 28: 125-174, New Orleans.

Willey, Gordon R., T.P. Culbert, and R.E.W. Adams (ed)
1967 Maya Lowland Ceramics: A Report from the 1965 Guatemala City Conference. *American Antiquity* 32 (3): 289-325. Salt Lake City.