The systematic study of ancient ceramics can provide information on many aspects of past societies. Because of the richness of the documentary and architectural record of the Medieval period, ceramics are often relegated to a secondary status and largely viewed as paraphernalia of the past. The establishment of this colloquium, and the diversity of articles in this volume document a transformation in this attitude. Ceramics are the most abundant and widespread component of the archeological record making them one of the best, if not the very best, source of information on both everyday life and the organization of past societies. The challenge before us, and other archeologists, is to develop effective methods for utilizing these ceramics.

Traditionally, ceramics have been most useful in Medieval studies when they have been shown to be diagnostic of a chronological period or of long distance trade connections. These are extremely important issues that continue to concern us, but this traditional approach is unnecessarily limited. First, it is limited by the relatively small proportion of ceramics, only the most diagnostic and complete examples are actually used in making these inferences. Second, there are limits on the range and precision of information on these two topics provided by traditional methods of studying ceramics.

The position taken in this paper is not that the past treatment of ceramics was wrong, but that there are many additional methods we can apply to the study of ceramics providing new types of data about the past. These new approaches include a diversity of techniques ranging from refring experiments and petrographic studies to advance statistical methods for analyzing quantitative information.

The central theme of this paper is not to describe in detail the techniques incorporated into the work presented here, but rather to argue for the use of a problem oriented approach to the planning, collection and analysis of ceramic data. The kinds of behavioral problems addressed in this study include 1) the diversity and distribution of activities and social groupings within individual sites; 2) the changing context of ceramic production and procurement at individual sites as a reflection of their economic and administrative systems; and 3) the comparison of the four sites, not solely in terms of chronology, but with respect to the above measures of internal community structure (for background to project see Redman, Anzalone, Rubertone, 1978, Redman, 1983).

**FACTORS AFFECTING THE USE OF CERAMICS AS EVIDENCE OF THE PAST**

Although the potential uses of ceramic information are many, the problems associated with its use require serious attention. The more the formation and deposition of a ceramic assemblage is investigated, the clearer it becomes that a multiplicity of factors are responsible for the composition of any particular assemblage. However, that is not a cause for abandoning sophisticated ceramic analyses, but rather a reason to be more systematic in their use. The simple assumption used by many prehistorians—that artifacts are made, used, and deposited in the same location— is clearly untenable when dealing with Medieval society. Among the processes examined by the members of our project have been to trace

---

* ACKNOWLEDGMENTS. I would like to thank members of the Archaeological Service and Ministry of Culture of the government of Morocco for their continuous support and to thank the staff of the Qsar es-Seguir Project that have contributed so much to this study.
the patterns of disposal of ceramics and other artifacts in an archeological site (Boone, 1980; Myers, 1979). It is possible to identify different contexts of deposition that contain significantly different proportions of artifacts. These patterns are related to the fact that for each for these contexts the rate of discard of various artifact classes will differ according to their use life, reusability, and likelihood of loss versus purposeful discard. Recognizing this, comparative analyses require assemblages from similar depositional contexts, such as the use of all room floors, all room fills, or all purposeful dumps.

Having selected the appropriate excavation units to study, the actual system used to record ceramic information has to be determined. One aspect of the recording system is the means of counting. When quantifying ceramics the alternatives of using numbers of sherd, weights of sherd, numbers of sherd per unit volume of dirt excavated, or some other standardization can yield measurably different results. We have found no simple solution to the ideal quantification, but at this time are experimenting with recording our ceramics by the percentage of the rim present. This approach has the advantage of allowing one to compare ceramics of differing types in terms of relative number of whole vessels that each assemblage contains. However, it has the disadvantage of not incorporating many of the sherds that are found and of being sensitive only to form varieties that can be identified by their rims.

A second basic decision in formulating a recording system is to select the categories to use for classifying ceramics. One may decide to rely on a system of recording individual attributes separately, such as color, paste, rim diagnostics, individual design elements, etc., or may choose to use a summary system of types each defined on the basis of several attributes. A type system is easier to use for succinctly describing and comparing a collection, but it has been found that this approach often masks a substantial amount of the variation in the collection because the researcher is forced to fit the sherds into type categories even though in many cases all of the definitional criteria are not met. Once a type or an attribute approach is chosen, it is necessary to select the attributes to measure and whether to focus on those related to ware, vessel form, or decoration. The variability in each of these categories may occur together, but they may also vary independently, reflecting different information about the past. It is the possibility that each different category of ceramic variability reflects a different aspect of past behavior that has led our project to analyze the ceramics in several different ways by using separate sets of measures (Redman, 1978). To use a single, undimensional system for recording a ceramic assemblage limits one's interpretation of differences to a single descriptive pattern, usually attributed to chronological variation. On the other hand, the use of multiple systems of recording and analysis maintains the possibility for discovering differing patterns of variability, each reflecting its own aspect of the past society. However, the use of multiple systems of analyses of ceramic material often yields confusing or seemingly complicated results. We must seek to understand these results so that we can move beyond simplistic uses of our artifact evidence. We propose that the key to understanding is to design our analytical methods to examine specific interpretive questions about the society being investigated.

**INTERPRETIVE APPROACH CURRENTLY GUIDING OUR PROJECT**

The current phase of research of my project in Northern Morocco is organized so that the field strategies and analyses are tailored to answer questions raised by a recently formulated interpretive model (Boone and Redman 1982). This model is concerned with the origin and growth of urban centers in medieval Morocco. We hypothesize that the politico-economic situation there created two types of geographic loci at which urban centers arose. Both of these were related to the long distance trade between sub-Saharan Africa and the countries along the Mediterranean basin. The first type of loci existed because of the geographically intermediate position that Morocco held between the gold producing regions of Sub-Saharan Africa and the centers of mercantile activity in the Mediterranean basin. This situation fostered the rise of the dynastic administrative capitals of interior Morocco that were concerned with facilitating and protecting the long-distance trade. The second set of loci are the geographic periphery of these dynastic empires: the Mediterranean and Atlantic coasts to the north and the edge of the Sahara to the south. Urban centers that developed here we refer to as coastal entrepots: these were involved in a variety of transshipment activities, and were often outside the direct control of the dynastic states.

The objective of our current field investigations and the analysis of materials found is to document the existence and nature of the two hypothesized urban forms. Given the geographic settings used for settlement and the political conditions inferred from historic records, the character of medieval Moroccan urban centers should be in accordance with the model presented above. In order to effectively monitor the differences between sites and the changes that occur over time at individual sites, it is necessary to develop a series of implications that this model has for the patterning of material remains we could excavate. The two major elements of this model to be investigated are forms of integration and differentiation in existence at each of the respective site types (see Fig. 1). Integration refers to the strength of the ties that develop between discrete spheres of economic or political activity some that operate within the individual community and others between communities. We predict that ties of an administrative capital will be with other centers within the boundaries of its state and that most materials will be derived from local production. Coastal Entrepots, in contrast, will maintain links with both cities of the interior state and cities in other countries.

The second element, differentiation, refers to the degree of diversification in an urban settlement, particularly in terms of occupation, status, and ethnic diversity. At least in their early stages, we predict that administrative capitals will have relatively low diversity in their array of economic activities and social groups (although widely disparate). Coastal entrepots, on the other hand, owe their origin to the diversity of economic opportunities inherent in their location as transshipment points between land and sea. Hence, we would expect to find a wider range of activities and social groups in independent coastal entrepots than in administrative capitals. These measures would not remain static such as, an entrepot’s range of activities diminishing when coming under direct control of a dynasty; or an administrative capital taking on productive activities for the local populace in addition to its role in long distance trade. We have tried
Figure 1: Alternate urban types and possible developmental trajectories with hypothesized differences in communitary organization and means of measuring with ceramics.
Figure 2: Location of archaeological sites in Northern Morocco that were investigated in this study.

To develop independent methods for measuring in each occupation phase the relative diversity of activities performed in a community and the relative differentiation of social groups.

The key to testing any interpretive model is to be able to collect the appropriate information. To do so we have identified six archaeological sites in Northern Morocco—three inland and three coastal sites—known from textual sources (Fig. 2). Four of these have been investigated with a series of dispersed excavation units. The strategy of using small dispersed test excavations is designed to maximize the representativeness of our collections and enable us to monitor changing community size and periodization. Four sites span the duration of the Medieval period from the first entry of Arab forces in the eighth century until the establishment of Portuguese and Spanish coastal colonies in the 15th and 16th centuries. I will briefly describe these sites and some of the ceramics we have recovered from them before discussing the methods of analysis used with their ceramics.

Qsar es-Seghir has been the main focus of our research for the past eight years. Although there are textual references (Redman, Anzalone, and Rubertone, 1978; Redman, Boone, and Myers in press) identifying the site as early as the eighth century, our archaeological work has shown that its primary occupation is under the Almohad and Marinid dynasties.

Badis is located 150 kilometers to the east on the Mediterranean coast at the mouth of a valley of the Rif mountains. Textual sources refer to Badis as the main Mediterranean port for Fes. Our archaeological soundings there date the major occupation to the Almohad and Merinid dynasties.

The Inland sites selected are a contrast to their coastal neighbors. Oldest of these is the earliest known principality of Islamic Morocco, Madinat en-Nakur. It is located about 50 km. east of Badis and 25 km. from the Mediterranean coast, at a strategic point in the Nakur river valley. Documentary evidence indicates that it was founded in 760 A.D. and destroyed by the Almoravids in about 1080 A.D.

The largest and historically most important of the sites we have tested is al-Batra located 40 km. inland from the Atlantic coast. Basra was supposed to have been founded by Idris II early in the ninth century and to have been capital of the Rif and Ghomara region until al-Hakam II razed its fortifications in 973 A.D. Some sources report that the city continued to exist for another century, although with diminished prominence. Our archaeological findings are very much in accord with the textual sources. Only early medieval ceramics
have been found at the site. Of very special interest, was our
discovery in 1980 of a well preserved rectangular updraft
kiln. On the basis of a brief magnetometer survey conducted
by Patriss Cressier we have located this past summer a se-
cond kiln of similar design, although somewhat smaller. In
both cases the evidence is not definitive, but we believe at
least a part of their function was for firing ceramics.

A similar set of measures could be derived for other aspects
of the ceramic assemblage, such as vessel form categories.
For a particular period of occupation it is possible to graph
the frequency of each, or only the most popular vessel forms.
It also is possible to calculate a summary measure of variabi-
licity for the overall assemblage. For the Islamic Qsar es-
Seghir assemblage 71 vessel forms have been identified. The
20 most common forms represent 80% of the collection and
are better to use for analysis of assemblage variation. The
coefficient of variation for this information is 73. Indicating
an even distribution of forms, as with wares. This then im-
plies the existence of a wide diversity of activities (as measu-
red by diverse vessel forms) at the site. But these are summa-
ry measures for one aspect of the assemblage, we should also
examine the patterning in individual vessel forms as they
vary between the excavation units. For the five most com-
mon forms in the Islamic levels the coefficients of variation
are (in order): 112.2, 104.0, 87.6, 118.4, and 829. Each of
these forms may have a hypothesized use and their occurre-
cnce across the site can be traced.

Analyses that provide summary statistics or examine sin-
gle ceramic types are useful for particular kinds of informa-
tion, but a more generalized approach to differing activities
across the site requires that the distribution of all of the
important vessel forms be examined in a unified multivariate
analysis. One approach to this would be to use a cluster analy-
sis to identify groups of assemblages that are similar to each
other. Using this method to study the distribution of vessel
from in a late level of Qsar es-Séghir, four clusters are identi-
fied (Fig. 4). Based on the vessel forms present, cluster one
could be interpreted as representing industrial activities,
cluster 2 a form of residential refuse, cluster 3 lived-in resi-

dential areas, and cluster 4 specialized dumps of residential
serving pieces.

It should be remembered that this particular interpretive
subdivision of the site, even if confirmed by other tests, still
is inferred from a single category of information—vessel
forms—and may reflect only a small fraction of the informa-
tion encoded in the ceramics. By using similar methods, but

different input data, such as the distribution of the seven
common wares at the site one can discover quite different
distributional pattern.

Although the above approach to within site analysis can
provide useful insights, the most important type of analysis
for documenting our current model involves comparisons
between sites and periods within each site. It is only through
some sort of comparative approach that we are able to pro-
vide real interpretive meanings to the material we are inves-
tigating. However, as useful as a comparative approach is, it
also has serious drawbacks. The ceramic inventory of a site
or a period within a site is formed by a number of factors
and we cannot expect these to yield identical material at dif-
ferent sites. Hence, it is difficult to use a single uniform sys-
tem of classification and recording of ceramics for differing
assemblages, or even for different periods at a single site.

This complicates the comparisons and necessitates the for-
mulation of specific lines of inquiry to be examined and
compared. This, once again, highlights the need for an inter-
pretive model to use as a guide to one's analysis. The model
pinpoints the measures to use for comparisons giving them
interpretable meaning. In the case of our model of urban
forms, I have calculated preliminary measures of the diver-
sity of activities and social groups at each site.
Figure 3: Proportion of basic wares found in each occupation phase.
The kinds of measures of diversity we have used at Qsar es-Seghir can be calculated for the other sites and then compared. Even the simplest comparison of the basic division of wares at the four sites already analyzed is informative. The coastal site of Qsar es-Seghir and the inland site of Basra are extremely similar in these measures, both having a very low proportion of hand built wares indicating that little of their assemblage derived from small-scale unimpressive ceramic production. This emphasizes the "urbaness" of the two sites. In contrast, the inland capital of Nakur and the coastal site of Badis both have relatively high amounts of hand built ceramics indicating strong interaction with the rural elements and/or the maintenance of small-scale productive units within the city. Interestingly, both Badis and Nakur are located to the east of the Rif mountain region, an area that has maintained its independence and resisted urbanism until the present day.

If one calculates an overall measure of diversity of wares for each of the sites, the pattern is similar, but with some differences. Qsar es-Seghir and Basra have similarly low values, both indicating a wide diversity of wares reflecting a diversity of socio-economic groups or at least participation in a diversity of procurement strategies. Nakur has the highest coefficient of variation, reflecting the least diversity of wares in its assemblage indicating the limited contacts and sources of materials this isolated early kingdom utilized. Badis exhibits an intermediate value of diversity of wares showing more wide-ranging procurement strategies than Nakur, but not as diverse as the other two sites. Badis might fit into our model as a coastal site that is dominated, and hence inhibited in its contacts, by a dynamic power as well as by the isolation of its geographic region.

When applying a similar analysis of variability to the data of vessel forms, the resulting pattern is quite different. This time Qsar es-Seghir and Badis, both coastal sites have low coefficients of variation indicating a wide diversity of vessel forms. This is interpreted to be a reflection of a wide diversity of activities involving ceramics that were conducted at these sites. As our interpretive model predicts, the inland capital of Basra and Nakur have substantially higher coefficients of variation, reflecting the narrow range of activities performed within the bounds of their communities.

Even though these are only tentative, incomplete measures of the processes we are interested in, it is clear that more rigorous application of similar methods will yield substantial insights into the organization and comparative structure of urban communities. To complete the picture, other avenues of inquiry must be pursued, although not treated here. Qualitative analyses, comparisons of specific traded wares, and petrographic analysis of all wares are integral components of any attempt to understand urban structure from ceramics.

The key issues presented in this paper are that 1) it is necessary to organize analysis to incorporate diverse categories of information within a structure that will provide information relevant to the questions being asked; and 2) that the formulation of an interpretive model of the processes being studied will help to specify the exact inquiries that must be pursued and will be an aid in determining the overall structure of fieldwork and analysis.

BIBLIOGRAPHY


### TABLA I

**ANALYSIS OF QSAR ES-SEGHIR CERAMICS**

Proportion of three major wares in assemblage:

<table>
<thead>
<tr>
<th>Ware Type</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheelmade plainware</td>
<td>94.7%</td>
</tr>
<tr>
<td>Handbuilt ware</td>
<td>4.4%</td>
</tr>
<tr>
<td>Luxury imported ware</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

Summary measure of diversity of wares in entire assemblage:

<table>
<thead>
<tr>
<th>Numbers of categories</th>
<th>% of sherds in first 15 categories</th>
<th>Total sherds</th>
<th>X</th>
<th>S_1</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>94.8%</td>
<td>27,552</td>
<td>1,306</td>
<td>1,204</td>
<td>92.2</td>
</tr>
</tbody>
</table>

Summary measure of diversity of vessel forms in entire assemblage:

<table>
<thead>
<tr>
<th>Numbers of categories</th>
<th>% of sherds in first 20</th>
<th>Total Sherds</th>
<th>X</th>
<th>S_1</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>80.0%</td>
<td>4,517</td>
<td>180.6</td>
<td>132.3</td>
<td>73.3</td>
</tr>
</tbody>
</table>

Measure of diversity of individual vessel from categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Total sherds</th>
<th>X</th>
<th>S_1</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jar form 30</td>
<td>1,426</td>
<td>118</td>
<td>133</td>
<td>112.2</td>
</tr>
<tr>
<td>Bowl form 10</td>
<td>512</td>
<td>43</td>
<td>44</td>
<td>104.0</td>
</tr>
<tr>
<td>Basin form 28</td>
<td>429</td>
<td>36</td>
<td>31</td>
<td>87.6</td>
</tr>
<tr>
<td>Bowl form 19</td>
<td>377</td>
<td>31</td>
<td>37</td>
<td>118.4</td>
</tr>
<tr>
<td>Bowl form 13</td>
<td>298</td>
<td>25</td>
<td>21</td>
<td>82.9</td>
</tr>
</tbody>
</table>
# TABLA II

**COMPARISON OF CERAMIC MEASURES FROM FOUR SITES**

<table>
<thead>
<tr>
<th></th>
<th>Wheelmade Plainware</th>
<th>Handbuilt ware</th>
<th>Imported luxury ware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qsar es-Seghir</td>
<td>94.7 %</td>
<td>4.4 %</td>
<td>1.0 %</td>
</tr>
<tr>
<td>Basra</td>
<td>93.7 %</td>
<td>5.4 %</td>
<td>1.0 %</td>
</tr>
<tr>
<td>Badis</td>
<td>61.7 %</td>
<td>37.0 %</td>
<td>1.2 %</td>
</tr>
<tr>
<td>Nakur</td>
<td>61.7 %</td>
<td>32.1 %</td>
<td>6.1 %</td>
</tr>
</tbody>
</table>

Summary measure of diversity of wares in each assemblage:

<table>
<thead>
<tr>
<th></th>
<th>Number of Categories</th>
<th>% of sherd in first 15</th>
<th>Total sherd</th>
<th>x</th>
<th>S,</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qsar es-Seghir</td>
<td>30</td>
<td>94.8 %</td>
<td>27,552</td>
<td>1,306</td>
<td>1,204</td>
<td>92.2</td>
</tr>
<tr>
<td>Basra</td>
<td>16</td>
<td>100.0 %</td>
<td>2,167</td>
<td>144</td>
<td>132</td>
<td>91.6</td>
</tr>
<tr>
<td>Badis</td>
<td>27</td>
<td>97.0 %</td>
<td>2,543</td>
<td>164</td>
<td>204</td>
<td>124.1</td>
</tr>
<tr>
<td>Nakur</td>
<td>21</td>
<td>99.5 %</td>
<td>212</td>
<td>14</td>
<td>26</td>
<td>184.0</td>
</tr>
</tbody>
</table>

Summary measure of diversity of vessel forms in each assemblage:

<table>
<thead>
<tr>
<th></th>
<th>Number of Categories</th>
<th>% of sherd in first 20</th>
<th>Total sherd</th>
<th>x</th>
<th>S,</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qsar es-Seghir</td>
<td>71</td>
<td>80.0 %</td>
<td>4,517</td>
<td>181</td>
<td>132</td>
<td>73.3</td>
</tr>
<tr>
<td>Badis</td>
<td>42</td>
<td>88.5 %</td>
<td>728</td>
<td>32</td>
<td>26</td>
<td>80.4</td>
</tr>
<tr>
<td>Basra</td>
<td>39</td>
<td>96.0 %</td>
<td>1,729</td>
<td>83</td>
<td>95</td>
<td>115.0</td>
</tr>
<tr>
<td>Nakur</td>
<td>25</td>
<td>95.5 %</td>
<td>155</td>
<td>7</td>
<td>8</td>
<td>112.8</td>
</tr>
</tbody>
</table>