The Utilization of Space of a Residential Sector at the Village Site of Murcielago, Costa Rica

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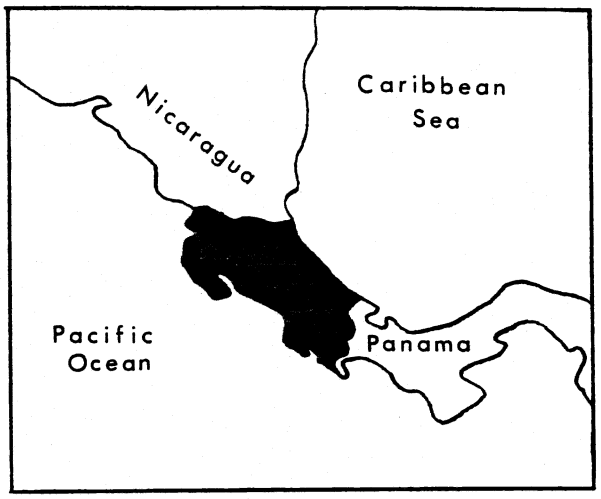
Anthropological research of discard and disposal behavior has been a topic of scholarly pursuit since the early 1970's. Depositional behavior, first defined and described by Schiffer (1972, 1975; Schiffer and Rathje 1973), has been the focus of various ethnoarchaeological (Binford 1976; Yellen 1977; Lange and Rydberg 1972; Hayden and Cannon 1982) and modern material culture (Rathje 1974, 1979) studies, but is seldom approached from an archaeological perspective.

The spatial organization of activities and discard behavior is seldom addressed directly in archaeological research. Yellen (1977) and, to a lesser degree, Winter (1976a, 1976b) and Whalen (1976) are the only authors to present a model for the description of spatial structure. This paper describes the utilization of space within a residential sector at the archaeological site of Murcielago, Costa Rica. The discussion focuses on the distribution of refuse pits and artifact categories within the residential sector. The data suggest that proximity to other residential sectors or households is a determining factor in the utilization of space at Murcielago.

The Site of Murcielago

Murcielago (P-107-Mc) is a single component Chiriqui phase village site located in the valley of the Rio General de Terraba, in the Diquis region of Costa Rica (Figure 1). The Chiriqui phase dates from A.D. 750/800 to A.D. 1520 (Drolet 1984a, 1984b). This phase witnessed the expansion of agricultural groups into the river valleys in the Diquis. Approximately one-half of the four square kilometer area of the site was intensively surveyed by Drolet and Markens (1982) during the 1980-1981 season.

Studies to define the internal spatial structure of Chiriqui phase sites in the Diquis have focused on Murcielago, which is the only one of five village sites that has preserved residential features (Drolet 1982). Drolet (1982) defined five residential sectors and a sixth sector of unknown function (Figure 2). The residential sectors are composed of two or more circular house foundations constructed of rounded river cobbles that are surrounded by refuse pits. These residential sectors represent naturally segregated sampling units. In 1985 Drolet began the intensive investigation of residential sector 6, aided by a group from the English Operation Raleigh. My work at Murcielago from January to May of 1985 focused on a residential sector located at the northern end of the site. The study area straddles the previously established boundary between sectors 1 and 2, establishing the existence of a previously unrecognized sector.



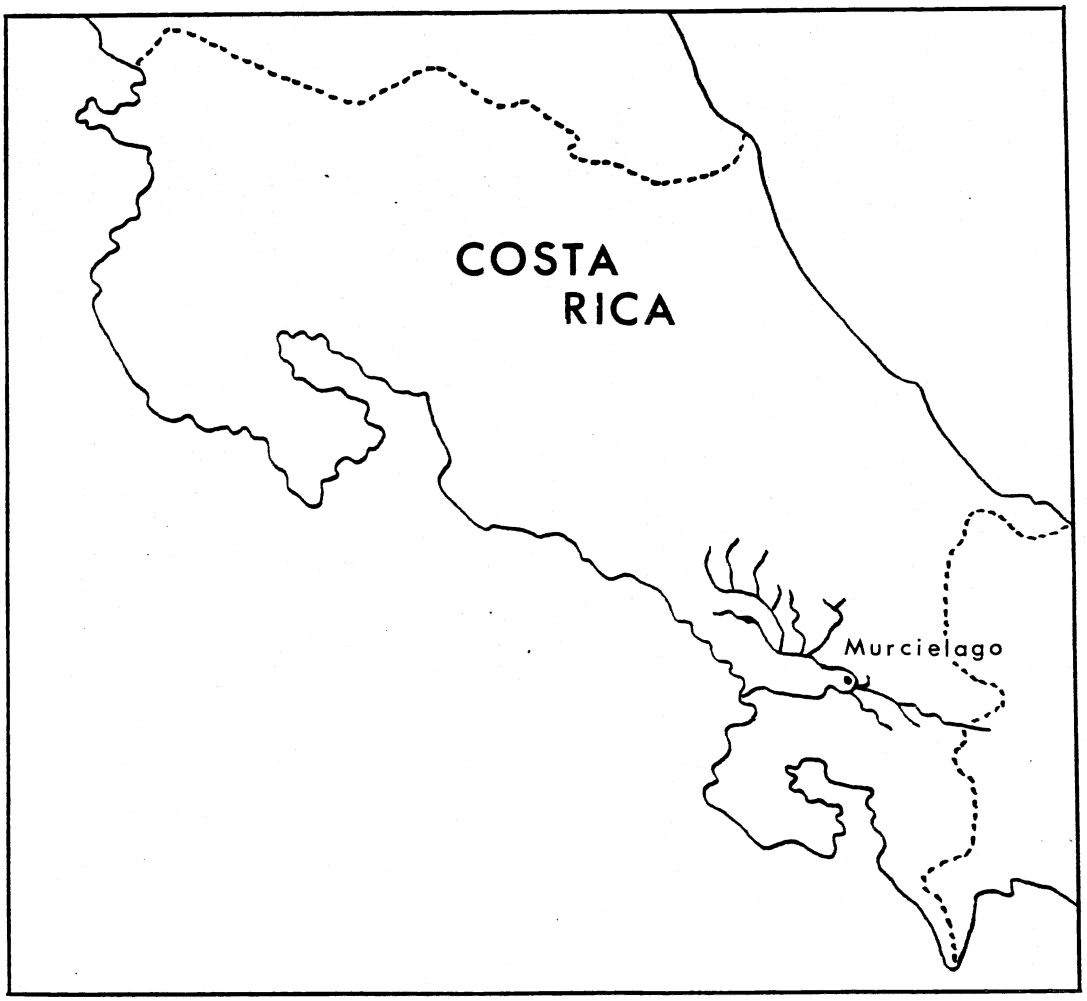


Figure 1. Map showing the location of Murcielago.

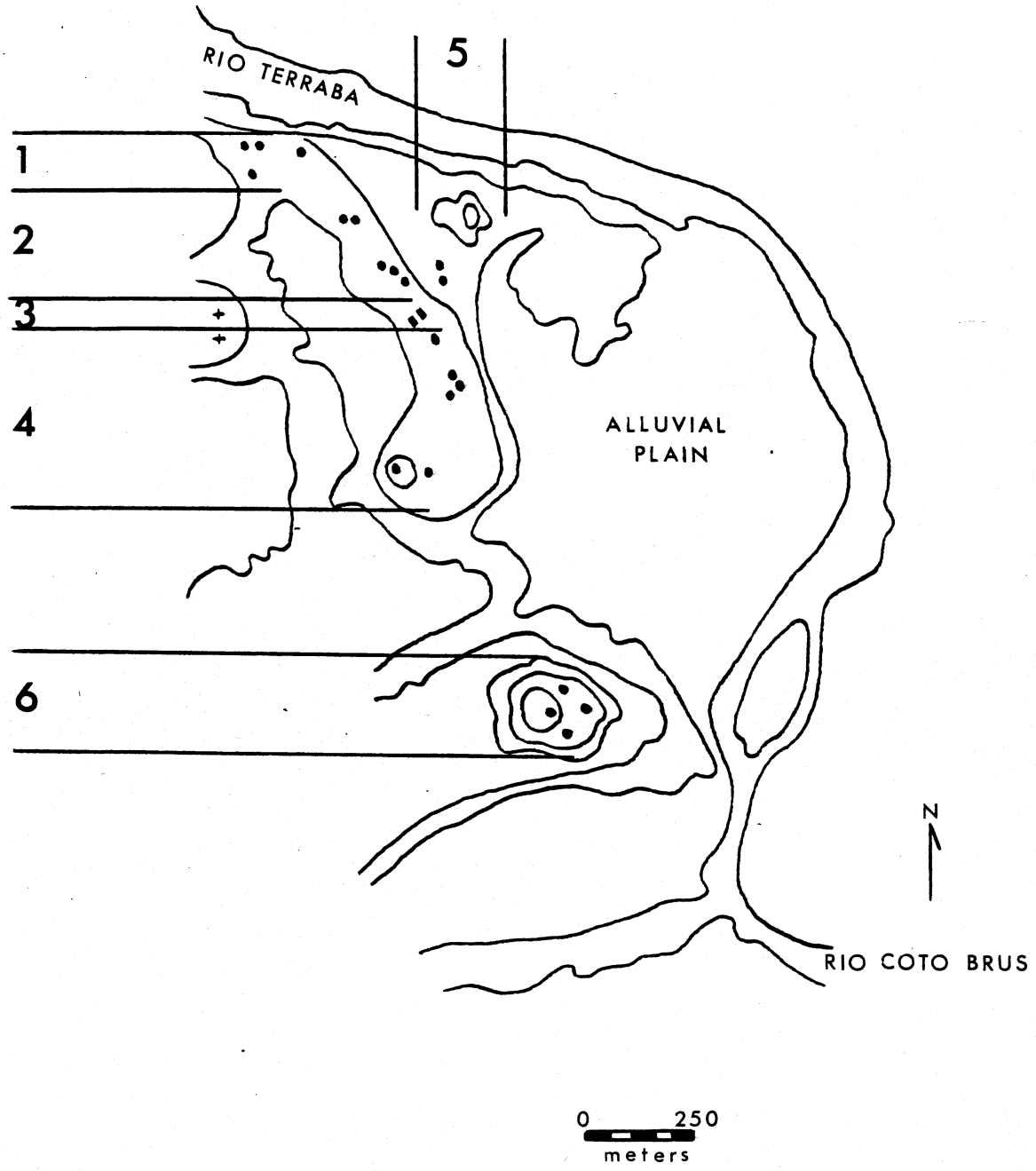


Figure 2. Site map of Murcielago. The numbers to the left indicate residential sector numbers. House foundations are indicated by dots. Burials are indicated by crosses. (After Drolet 1982).

Analysis

In analyzing the spatial structure of the residential sector, concentric circles of arbitrary twenty-five meter intervals marked off in arcs of forty-five degrees were imposed on the site map (Figure 3). This method of analyzing spatial structure was derived from Yellen's (1977) ring model for !Kung San camps, Winter's (1976a, 1976b) and Whalen's (1976) examinations of archaeological sites in the Valley of Oaxaca, and the descriptions provided by Hayden and Cannon (1982) in their study of three highland Maya villages as part of the Coxoh Ethnoarchaeological Project.

There are two basic patterns of space utilization that are common to all of the studies. The first is the maintenance of a relatively uncluttered debris-free zone in the immediate area of the house. The second is the location of a disposal zone around the house. Comparison of the Yellen (1977) and Hayden and Cannon (1982) studies suggests there are differences in disposal patterns and the use of space between these sites. The difference appears to be one of complexity determined primarily by sedentism.

Spatial Analysis

The residential sector examined at Murcielago consists of three house foundations and 305 refuse pits that encompass 5.875 hectares in area. A residential sector is defined on the basis of "vacant areas" (Drolet 1982) between itself and neighboring sectors. In actuality, there are no clear breaks in the

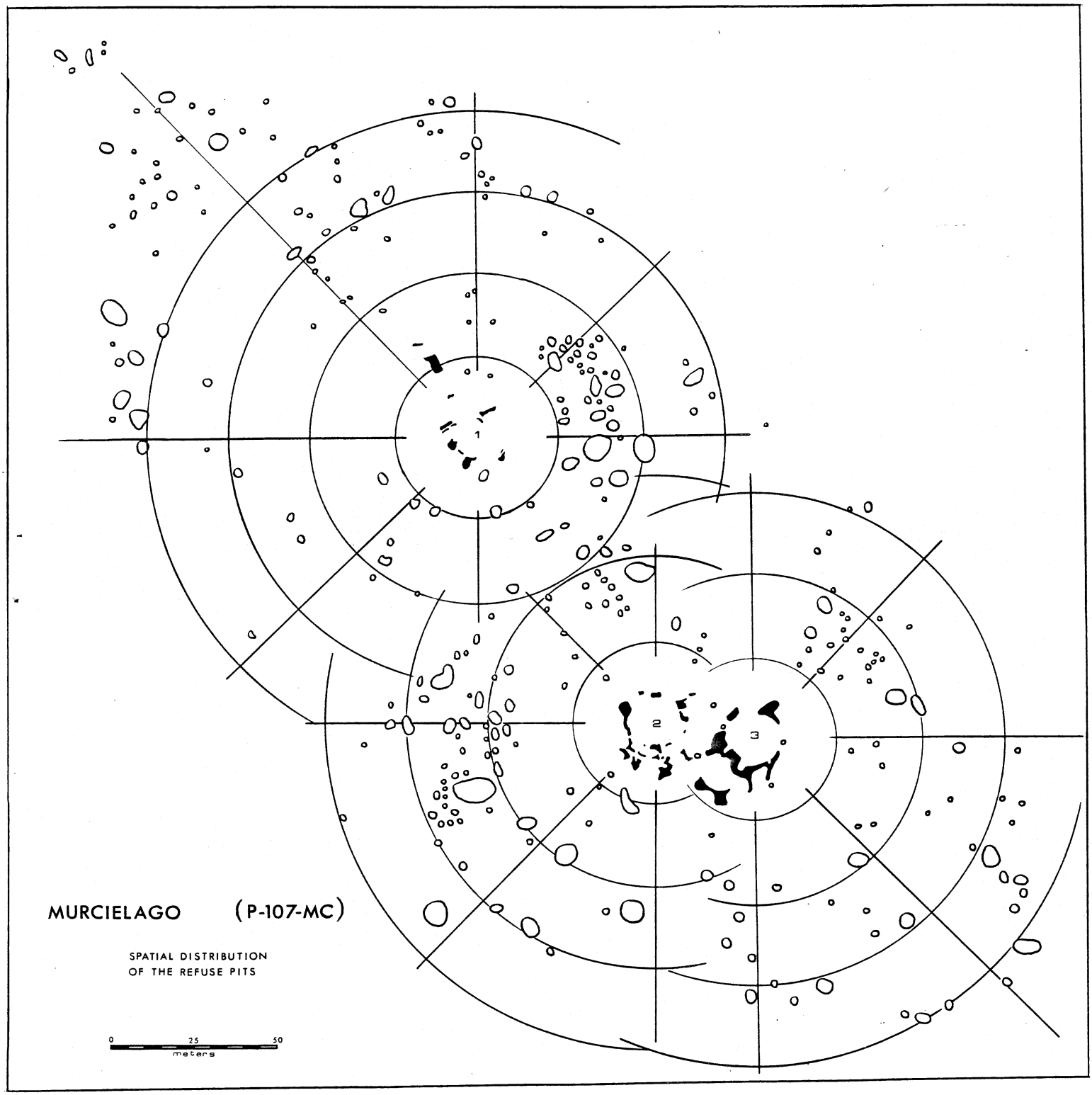


Figure 3. Site map of the residential sector of Murcielago. The concentric rings and arcs are the method used for the examination of the spatial structure of this area.

distribution of refuse pits, either between residential sectors or between house foundations within residential sectors. The drop in the density of the pits was therefore used as the defining criterion.

The area of refuse pits in the residential sector extends some 175 meters to the northwest of house foundation 1 and just over 100 meters to the southeast of house foundation 3. The percentage distribution of refuse pits along the northwestern edge decreases to 3.46% in density, and to 2.98% along the southeast. The distribution is partially determined by topography, but there are indications that social factors were also involved. To the east, there is a slope of approximately forty-five degrees above an alluvial plain. Refuse pits on this side occur on the slope but do not extend onto the plain, which is thought to have been farmed in the past. There is no such restrictive topographic feature to the west, which is another plain or river terrace, yet the refuse pits extend no further than is shown on the map (Figure 3). The northward extension is unhampered by the close proximity of another residential sector and the distribution tends to be dispersed. However, along the southern edge, an adjacent residential sector limits the extension of dump sites in this area.

The spacing of residential sectors at Murcielago is unlike the archaeological sites examined by Winter (1976a,1976b) and Whalen (1976) in Oaxaca. Winter (1976a, 1976b) and Whalen (1976) found a regularity of spacing between residential features at Tierras Largas and Santo Domingo Tomaltepec. The spacing separated unrelated groups or groups of unequal status.

Residential sectors at Murcielago are not uniformly spaced. Distances between sectors 1 and 4 vary between 175 and 250 meters. Sector 5 is located on a terrace below the main portion of the site. The location of Sector 5 tends to support the suggestion that the flat alluvial terraces were used for agriculture. Sector 6, located over 500 meters to the south on a separate hilltop, is the most distant residential sector. The data suggests that maintaining some distance from other residential sectors was a factor of sector location, but there do not appear to have been rules that established a social norm for any particular measure of distance.

Each house foundation in the residential sector is treated as a separate "household cluster." Winter (1976a), who established the household cluster as a valid unit of analysis for examining intersite variability, defines it as a dwelling and its associated pit features. Examination of the spatial configurations of these units allows the definition of patterns at the household level. Comparison of the resulting body of data generates information about the residential sector as a whole.

Examination of the percentage distribution of refuse pits by zone suggests that a certain amount of land around house foundations was kept relatively clear of refuse pits. In all cases, no more than five refuse pits occurred within 25 meters of a house foundation. This confirms the pattern described in the ethnoarchaeological studies of Yellen (1977) and Hayden and Cannon (1982). The area immediately around a dwelling is systematically cleared of debris.

A similar pattern was observed at the Boruca village of Rey Curre, Costa Rica. Refuse pits are still used to some extent in the village, though burning is another method of refuse disposal today. The patios of the houses are swept daily to keep them free of debris. During one visit the author observed a pit on the outer perimeter of the patio into which the daily sweepings were dumped. Pit contents included leaves, loose gravel, bits of paper, and a single worn-out shoe. Additional secondary dump areas are located outside of the immediate living area, just as they are at Coxoh and Murcielago.

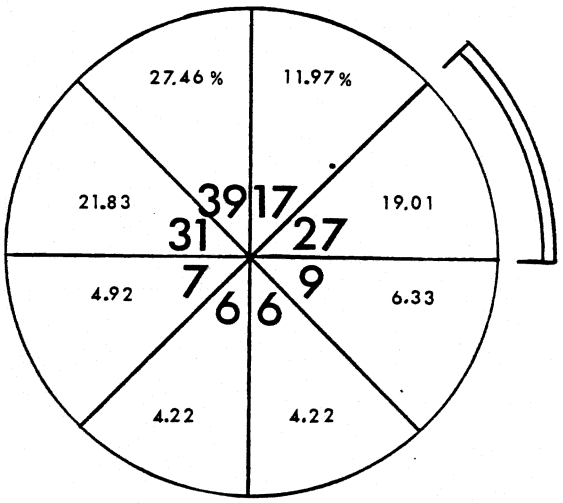
The majority of the refuse pits at Murcielago occur within 100 meters of the dwelling. Preliminary results of the analysis of pit contents suggest that the interval between 25 and 100 meters was the final disposal zone. Seventy percent of the refuse pits associated with house foundation 1 occur in this zone. The percentages are much larger for house foundations 2 and 3. Of the 86 pits counted for house foundation 2 slightly more than 94% are found in this area. Ninety-one percent of the 68 pits assigned to house foundation 3 are located between 25 to 100 meters from the dwelling. One hundred meters might be called the limits of convenience for refuse disposal.

Comparison of the spatial structure of individual households suggests that there were additional considerations governing the utilization of space in the residential sector. There does not appear to have been any rule governing the location of a dwelling within a residential sector. House foundation 1 is separated from the others by approximately 100 meters. House foundations 2 and 3 are adjacent to one another,

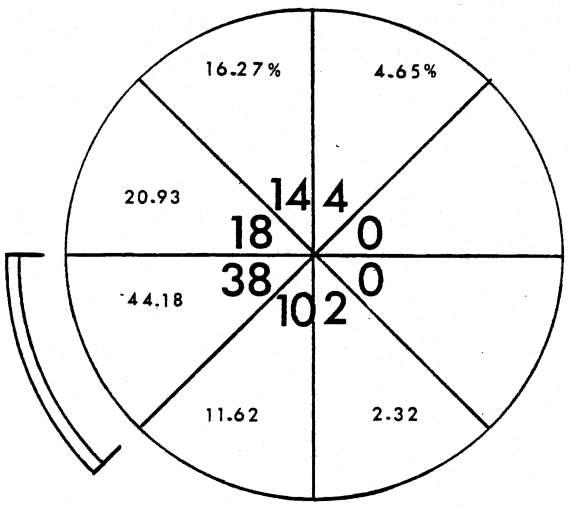
separated by only 10 meters. This configuration is unique to the residential sector. This data suggests that the location of houses within the residential sector was a matter of personal choice.

However, there appear to have been conventions governing the organization of activities and the utilization of space within the residential sector. The distribution of refuse pits suggests that proximity to other dwellings was taken into consideration. The results are summarized in Figure 4. Approximately 80 percent of the refuse pits associated with house foundation 1 are located on the northern side of the east-west axis. Ninety-three percent of the pits of house 2 occur west of the north-south axis. The pattern is reversed for house foundation 3, where some 88 percent of the refuse pits are located east of the north-south axis. The data suggest that systematic attempts were made to dispose of refuse in locations that took into account the proximity of other dwellings. This is most evident between house foundations 2 and 3 where physical proximity (ten meters) would tend to select against the location of dumping areas in this zone. The pattern holds true for house foundation 1 as well as the area south of the east-west axis which was kept relatively clear of refuse pits.

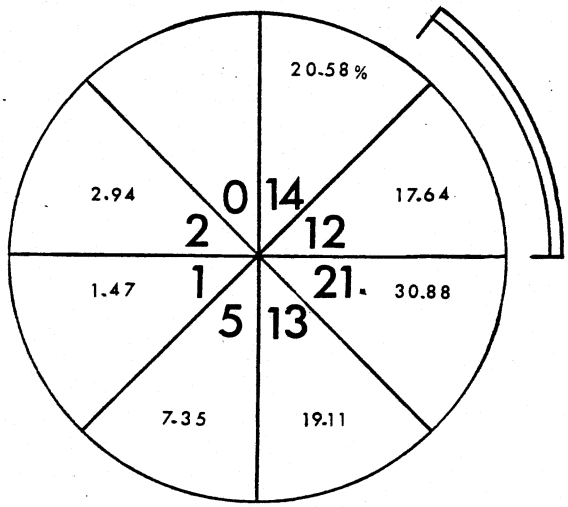
The pattern can be clarified further by examining the distribution of refuse pits within the 100 meter interval established as the limit in which the majority of these features occurs. Figures 3 and 4 show that there are areas between houses in which the density of refuse pits was relatively low. These areas would facilitate interaction between houses. At the



HOUSE FOUNDATION 1



HOUSE FOUNDATION 2



HOUSE FOUNDATION 3

Figure 4. Percentage distributions of refuse pits for the three house foundations. Large numbers in the center represent actual counts. Percentages are presented on the outer edges of the sectors. The markers outside the circles represent the areas that have the highest concentrations of pits at a distance no greater than one hundred meters from the structure.

village of Rey Curre a network of paths connect individual households. As a general rule, the most dense concentrations of refuse dump areas occur in areas away from these thoroughfares.

Distributional analysis of refuse pits occurring within one hundred meters of each house foundation indicates avenues of access were maintained, and further elucidates the practice of locating dump areas away from other households. The sectors with the greatest concentrations of pit features have been marked in Figure 4. The identification of sectors of disposal demonstrates that the proximity of other residences is a determining factor in the location of dump areas.

Conclusions

The utilization of space at Murcielago is determined by topography, social conventions, and perhaps subsistence activities. The determining social factor appears to be proximity of households. The major portion of the site lies along a low ridge that overlooks an alluvial terrace to the east. The alluvial terrace has no cultural remains (Drolet, personal communication) and is thought to have been an area of agricultural fields during the occupation of the site.

Analysis of the spatial structure of residential sectors and household clusters in the study area indicates that there was no formalized plan for the site but there were organizing principles. Attempts were apparently made to maintain a level of separation in the spacing of residential sectors. Occupants of a sector might expand in the absence of a neighbor, but the presence of one, such as occurred along the southeastern edge, led

to the restriction of expansion in that direction. There is no clear break between neighboring units, but the decreased density in refuse pits supports the interpretation of the maintenance of separateness.

Structure is also evident in the internal organization of a residential sector. Analysis of individual household clusters indicates that there were common patterns in the utilization of space. An area immediately around the dwelling is kept relatively free of debris and dump areas. The same pattern has been described by Yellen (1977) and Hayden and Cannon (1982), and is observed at the village of Rey Curre. The location of dump areas around the residences is also a common pattern. At Murcielago, the disposal zone in which the majority of pits are found is located between 25 and 100 meters from the dwelling.

The location of houses within a residential zone appears to be variable, though there are conventions governing the location of refuse pits within this zone. While there is some randomness in the distribution, systematic attempts were made to locate pits on the sides of dwellings away from the other houses in the sector. It is suggested that this practice maintained avenues of access between households. Proximity appears to have been the determining factor in the utilization of space at Murcielago.

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