

SOCIAL BEHAVIOR AND SPATIAL CONTEXT

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ABSTRACT This is a study of the Nchumuru, a Guang-speaking people who in prehistoric times came to inhabit large parts of Ghana and still maintain their traditional social system and subsistence practices. This paper examines how ethnographic data from the modern settlement of Wiae in the northern Volta Region of Ghana in West Africa, has been used to predict and explain spatial behavior within Nchumuru archeological village sites.

The balance of evidence coming from the archeological surveys and excavations, suggests that the Nchumuru settled in family groups in the area of Volta Region in small villages each approximately four to five hectares. The house structures clustered into quarters each representing a clan (*kabuno*) and having an ancestral shrine located in the center of the house of the head. Compared to the house forms in modern Wiae, early Nchumuru houses did not possess the L- and U-shape configuration which defines a field of space that has an inward and outward orientation. This has been demonstrated to indicate that, since they settled in the area the spatial potential of the settlement was being invoked to make up for what the social resources of the group could not provide.

Using a model termed the Local rule (L-R) model of spatial behavior, the paper explains that Nchumuru social system has been observed to operate at individual, clan (*kabuno*), and phratry (*kasuro*) levels. It is demonstrated that each of these levels of human social behavior follows spatial patterns that can be explained by an understanding of the opportunities offered by the social relationships (social resources) and the environment (natural resources). It is generalized that the organizational rules of the Nchumuru are not as rigid as those operative in the physical world, but they exhibit sufficient regularities to be recognized and described firstly as part of its major social group (the Guang) and then as Nchumuru, and also for explaining social and cultural continuities in the archeology of their settlement history.

In discussing spatial relationships in settlements, procedures of identification and specification require the consideration of a large number of factors such as resource and resource areas and distribution, alternative activities, locations, constraints, rationale behind locational decisions, cultural background and relationships and the complex inter-relationships that bring all these factors together. The development of spatial methods and theories in archeology to explain these relationships have taken various forms over the last century—from the direct equation of archeological spatial relationships with social or cultural ties, to a more recent structural and behavioral approach. In this paper I attempt to demonstrate more positively than has ever been attempted in the area, a theoretical and methodological approach that will refine in considerable proportions archeological reasoning and interpretations derived from the articulation of ethnographic with archeological data. The focus is on how structural features are located or distributed within and around a Ghanaian traditional settlement. I put up arguments to support the proposition that the cultural processes which created the settlement pattern can be inferred from its spatial form.

My research consisted of a study of Nchumuru, a Guang-speaking people who in prehistoric times came to inhabit large parts of Ghana and still maintain their traditional system and subsistence practices. The study used ethnographic data from the settlement of Wiae in the Banda traditional area (Fig. 1) of northern Volta Region of Ghana in West Africa, to predict and explain spatial behavior within Nchumuru archeological village sites. The predicted patterns were tested by archeological surveys and excavations of early Nchumuru sites.

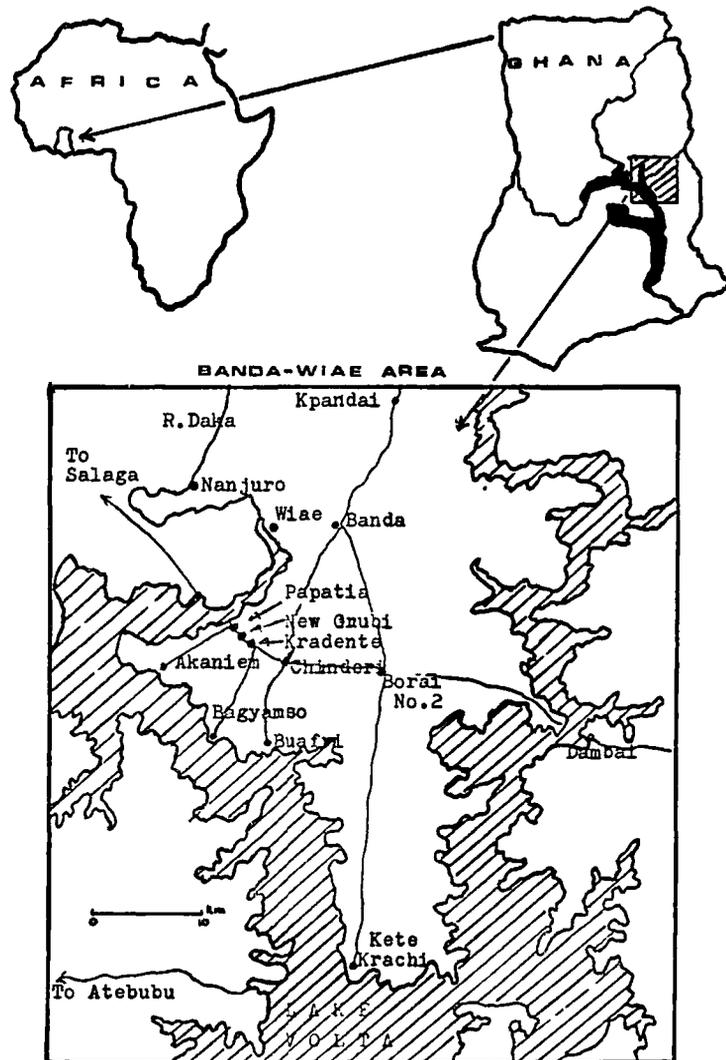


Fig. 1. Banda-Wiae area.

My first direct research contact with settlement archeology was in 1972 when I selected the Banda-Wiae area for an ethnographic study as part of my M.A. program at the University of Ghana. The most important reason for my choice was the need to select a village which had not been resettled under Ghana's Volta Lake resettlement scheme. It was important to select a settlement whose traditional economic, political and social life has witnessed little impact of industrial activity. This was because it was advantageous to study a village for which there was both ethnographic and archeological evidence. Secondly, the aim of the pilot project was to study the location and distribution of visible material remains within the village in order to speculate about how much would remain in the archeological record qualitatively and quantitatively after abandonment. Thirdly, it

was important to select a village of manageable size and accessibility relative to the time and resources personally available. A final reason which governed my choice of the Banda-Wiae area was my general background knowledge of the area, having been brought up in the adjoining Kete-Krachi area and having an ability to speak their local dialect fairly well.

The pilot research of 1972 was considered to be a project that could be developed after my M.A. program. Consequently, two more brief trips were made in 1975 and 1978, to observe changes in the spatial development and physical conditions of modern and Old Wiae. Since then, the area has fascinated me, as it has great potential for ethnoarcheological study that could be usefully applied to the discovery of rules for explaining the dynamics of spatial distribution of cultural remains as related to the behavior of the Nchumuru society at their prehistoric site. I developed an interest in the oral tradition of the people of the area and realized that it contained a great deal of material for observing the process of decay of abandoned settlements which was my initial interest. However, subsequent research interests developed from experiences and training I obtained under the West African Trade Project, centered at the village of Hani in the Brong-Ahafo Region of Ghana and in which I was one of the first participants. However, my doctoral research developed in the Wiae ethnographic study. Additional questions were added, such as: what predictions can be made about the spatial behavior patterns at Nchumuru prehistoric sites and how can one determine whether or not the predictions and tests are accurate? And, what generalizations can be made about Nchumuru prehistoric site behavior? The background work from my 1972 project was clearly linked with the data required for the present research.

However, limited research time and financial resources placed constraints on the amount of archeological testing that I initially considered would have been substantially adequate for testing the predictions of the study. Nevertheless, the result of the research indicates that the limitation was only quantitative in nature and that future availability of support would surmount the problem. Interestingly, the constraints seemed to have helped prevent the temptation of doing too much data collection beyond the requirements of the questions being considered in the study. In this sense, it was an advantage rather than a set back.

My initial survey listed seventeen settlements. This list was narrowed down to two, Nanjuro and Wiae, of which the latter became the final choice. Some of these settlements were already being flooded by the Lake, others were already half-evacuated.

The Nchumuru as a Social Group

Structurally the whole Nchumuru group consists of five family groupings (Aduana, Banda, Chachai, Nchenke, Kpentanai and Sunwai). They are traditionally called Nsuro (*k'asuro*, sing). Each has its own stool and principal village. Each Nchumuru village or town essentially consists of one or more core minor family groups (or patri-clans) called *mbuno* (*k'abuno*, sing). Each of these *mbuno* has a male head, its own residential area in the village, ancestral shrine, its secrets, properties, inter-village and intra-village relationships. Inheritance is by homogeneous transmission (male to the next oldest male/female to the next oldest female) and occurs within the *kabuno*. There are five *mbuno* in Wiae. Fig. 2 summarizes the social network and inter-connections and indicates *mbuno* relationships transcend the boundaries of the village.

The five *mbuno* of Wiae include Breniase, Dapoeta, Kpenwiae, Ntrapo and Tarieso. The ancestral shrine symbolizes the respect given to the *kabuno* head. The *kabuno* is the most important single social unit in any Nchumuru village. The authenticity of a member-

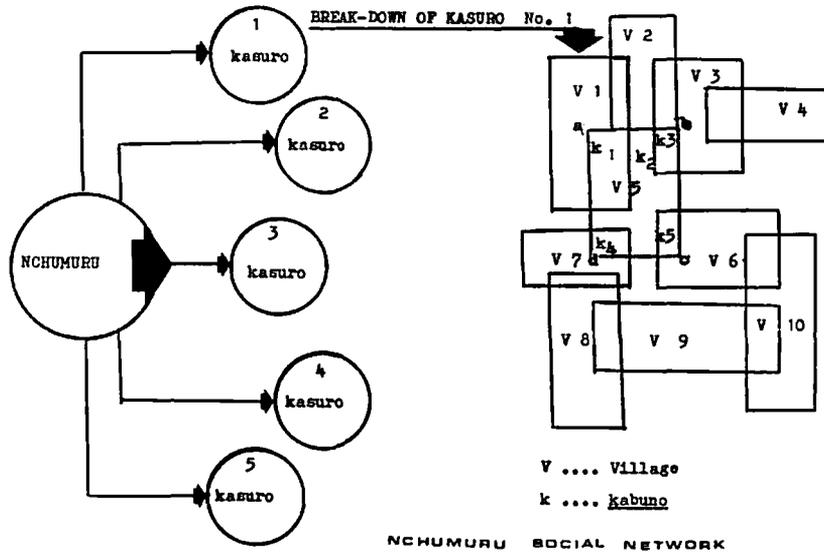


Fig. 2. Nchumuru social network.

ship of the society is determined by his relationship with a *kabuno* which does not consist only of the living, but also and primarily, the dead righteous ancestors. Traditionally the *kabuno* members are required to live around the ancestral shrine usually located in the *kabuno* head's house.

Time Dimensions

The Nchumuru have a six-day week as follows: *k'kruwa*, *k'enyenne*, *k'emunake*, *k'kpawa*, *kpangya*, *kepowe*. The sixth day of the week, *kepowe* is by custom and belief the day of rest. On that day no one goes to the farm or field nor is allowed to undertake hard work. It is the most important day for social interaction between families and villages, and for religious activities. Other activities usually undertaken on that day include family discussions and meetings, funeral and customary rites as well as visit to relatives in other villages.

The seasons are not thought of in terms of a large solar clock or calendar, but are seen as a sequence of activities such as planting and harvest times; the years are clustered around important traditional events; the days are divided into activity spans, the cool of the day and evening. The activities themselves develop according to their own internal rhythm. To sum up, the Nchumuru do not socially separate "leisure" time from other time.

Explaining the Growth of New Wiae

Explanation of the growth of New Wiae can be provided within some general theoretical frameworks of spatial organization. It is important at this point to emphasize the overriding significance of family group affiliations (the *kabuno*) among the Nchumuru. The correlation between spatial configuration and social structure may in some cases be obvious; in others extremely difficult to discover. But my study demonstrates that Nchumuru spatial configurations reflect not only the true unconscious social organization, but a model existing consciously in their traditional mind though its nature may be illusory and even contradictory in reality. This conjecture is based on my assumption that any manifestation of social phenomena, such

as arrangements in a village, constitute a language in the sense that it can be reduced to a set of abstract rules, and expressed in different models.

In recent years it has been suggested that space organization should be seen as a family of morphic language which borrows from natural and mathematical forms (Hillier et al., 1976). This idea was used to explain what is said to constitute systematic production of space pattern. As a result they have proposed a general syntax theory of space organization, which attempts to demonstrate that spatial patterns fall into eight major types which are structurally related. The development of each pattern follows certain rules and should therefore develop into an expected pattern.

The first syntactic rule, for example, describes a situation in which ground space is colonized piece-meal by human groups. It explains that the first object is placed at random and then another one, an arbitrary distance away in an arbitrary direction depending on the constraints imposed by topographic or other features. A third and subsequent objects will consider the zone in which the first pair have been located as the zone to which they relate and therefore locate within it. As the process continues the space within the initial area termed the *carrier space*, is filled in as more objects or structures are built. In such a process, the location of the objects will follow a local rule of belonging to the same carrier space depending on the relationships between those responsible for the locations. The first syntactic rule as explained is a common behavior of any form of development or occupation of space. It provides minimum characteristics that indicate behavior patterns comparable to the maintenance of spatially coherent aggregate where relationships between the elements involved are such that they have the tendency to locate close to one another.

The development of the above type of spatial pattern demonstrates that there is a means of producing an overall differentiation in the man-made landscape without a clear idea of the limits of the settlement of the carrier space occupied by the society. Hillier and his colleagues cite the Tallensi of Northern Ghana, as described by Fortes (1945), as example of the 1-syntactic type. The growth of New Wiae can certainly be related to the space syntax theory in a similar manner as the Tallensi settlement of the Tongo has been considered. But as should be understood, the trend of development of spatial pattern within any carrier space will depend on local rules, pre-existing conditions and the stage in its growth. The pattern of development of New Wiae seems certainly to have been a result of a type of space organization which combines (as the syntax theory explains) elements of 1 and 2 syntactic types.

The theoretical framework as outlined above should be considered as a tool providing a basis for explaining rather than just describing a situation. The actual spatial behavior of any group of people using these spatial theories can be recognized in the context of the local situation which can be identified by the local rules, of spatial behavior of the community under consideration. In order to provide a background for the understanding of the importance of the *kabuno* system in the identification of the local rules in the Nchumuru traditional system, detailed discussion of the social network and relationship among the Nchumuru would have been most appropriate, but this cannot be done at this point. However, this can be obtained in my doctoral dissertation (Agorsah, E. K., 1983).

Reflections on the Growth of New Wiae

The development of New Wiae occurred within a period of just about three or four decades, or two if we are to relate it to the time of the destruction of Old Wiae by fire. Most of the details concerning its growth are still fresh in the memories of a few people in Wiae. This memory fades as one goes back in time, an obvious problem which is characteristic of oral traditions. Another significant thing about the data on New Wiae is the clear link that can be

established between its growth and that of Old Wiae. Clearly, the *kabuno* system of the Nchumuru has some effects on the colonization of space within the settlement. The system defines the dimensional regularities rather than being constrained by those regularities. At the level of Nchumuru community behavior, the development of Wiae is considered in relation to the spatial framework in which they had previously lived, as well as in terms of all the factors of pragmatic demand which influence their decisions as to where to locate their family groups. Since the Nchumuru perception of location of the *kabuno* houses seems to be repetitious and carried through time (according to their traditions) the development of any Nchumuru settlement would theoretically assume the pattern observed at New Wiae. One is easily tempted to correlate the *kabuno* clustering in New Wiae with those of other Nchumuru settlements such as Bagyamso, Papatia, Akaniem, Grubi, Bankamba and others.

There is more to understanding the development of New Wiae than merely knowing about fundamental local institutions or concepts such as that of the *kabuno*, and secondary spatial concepts and theories. The pattern of development is not static. Therefore, it is important to know a great deal about the cultural processes that produced the pattern, and to relate the location of each structural feature of the distribution to each other feature individually, and then to the entire pattern of location. The regularities depicted by the relationships constitute the subject of the discussion which follows in the next section.

Pattern of Distribution of Houses in Wiae

A pattern of point features was used to determine whether the house structures in New Wiae are clustered. The quadrat analysis was applied. A regular grid ($5 \times 10 \text{ m} = 50$) was superimposed over the distribution of all structural features as observed in New Wiae in 1981. A tally was then made of the number of structural features falling within each quadrat. The number of individual structural features per quadrat were then compared with the expected number per quadrat if they were randomly distributed in the carrier space of the settlement. The mean-Variance ratio was then computed using the following statistical computation:

$$\frac{\text{Variance}}{\text{mean}} = \frac{n}{n-1} \times \frac{\sum x^2 - \frac{(\sum x)^2}{n}}{\sum x}$$

where $(\sum x)$ = sum of the quadrat values;

$(\sum x)^2$ = square of the sum of the quadrat value;

$(\sum x^2)$ = sum of the squares of the quadrat values.

In this computation it was expected that the value of 1 indicates a random distribution; values larger than 1 indicate clustering and values smaller than 1 suggest regularity. The values were considered in relation to the size of the quadrats used. Sampling a distribution with quadrats of different sizes determines at what scale clustering occurs. Using different scales permits one to be able to detect non-randomness in a distribution when visual inspection may reveal no sign of clustering.

The dispersion in point patterns for New Wiae was 0.9, and can be said to be essentially random. Increase in the quadrat size by half put this figure at 2.64 which indicated clustering. In fact these figures do not refer to the spatial pattern of individuals on the ground from one quadrat to the next as was expected. Since the location of the quadrats having different numbers of structural feature occurrences were not considered in the computation the resulting measure of dispersion was considered non-spatial.

From the foregoing discussion, it is easy to make strong arguments against the proposition that the cultural process which created a settlement can be inferred from its spatial form. The

case of New Wiaie is an obvious indication that this has some support in the realm of human behavior, the basis of which is the *kabuno* system. Comparison of the above analysis with the observed distribution of the *kabuno* areas shows that the social processes may not necessarily be spatial in character, because several different processes may give rise to similar patterns. Even societies that are similar in many respects could generate different patterns of settlement as a result of relatively basic differences between them, making it difficult to recognize differences in partening.

The form of spatial relationships within the settlement, therefore, has to be described by the social patterns of behavior to which individuals and groups conform in their dealings with one another. These patterns are usually formulated in rules which even in modern societies are recognized as rules of etiquette or moral rules. These rules exist only in their recognition by the members of the society, either when they are explicitly stated as rules or implied in their behavior. For the reconstruction of the past of a traditional society such as the Nchumuru on the basis of ethnographic observation, it is the latter consideration which is more important.

The model I am proposing here is referred to as the local rule (L-R) model of spatial behavior. It explains that for every society of groups of societies, one of two local patterns of behavior must be expected—a rule which is positive or symmetric in nature, or a rule which is negative or asymmetric. In the former any arrows showing relationships between individuals or groups must go both directions. For the negative relationship arrows must never go in both directions between any pair or groups of individuals. Basically, the L-R model explains that people locate themselves closer to those to whom they have more intimate relationship or recognize as able to share the same carrier space without deviating from their expected goals. Simply, this means that, with no limiting factors, if “A” has good relationship with “B” but not with “C”, “A” will locate in the same carrier space with “B”. In this case the relationship between “A” and “B” is said to be positive, but between “A” and “C” will be considered to be negative. The manner in which people locate themselves in a conference hall, athletic field, on the bus and similar places can be used to explain the local rule of spatial behavior. Relationships may change over time and in given situations. However, when any such a relationship results in the erection of structural features such as houses, storage facilities, burial grounds and other fixed structures, they leave marks that cannot be altered with the change in relationship. It is this aspect of spatial behavior that the L-R model emphasizes.

In many West African cities and towns such as Ho in the Volta Region of Ghana specific areas indicate such names as “*anagokodzi*” (Ewe), meaning the area occupied by immigrants from Nigeria or the same as “*Lagos Town*” in the city of Accra. *Zongo* is another term used in many towns in Ghana to refer to areas occupied by muslim immigrant communities. This kind of situation is even more clearly observable in the smaller traditional settlements, especially because clan or group relationships are also more clearly defined. In a society in which the builder of the environment is the user and at the same time the one who maintains it, social connections play a very significant role in spatial behavior. To the Nchumuru of Ghana spatial behavior is not merely a technological problem, but principally dictated by the character of the social relationship. There may be aesthetic and geometric considerations, but the main goal is the practical and cultural values. The L-R model served as a guiding principle for the predictions of the study of the Nchumuru.

Generally, it was predicted that an early Wiaie settlement should consist of houses and associated features situated or arranged in groups or clusters each separate but an integral part of the settlement’s carrier space. The clustering is attributed to the *kabuno* system. Differences in appearance between Old and New Wiaie are explained in terms of different pre-existing

conditions of their development. A gradual shift from circular to rectangular house forms was also predicted. For Old Wiae, fifty-seven individual houses were predicted each with approximately 6.2 persons. For each house, I predicted that there would be at least two main types of rooms: an all-purpose and common room traditionally referred to as *limbu* by the Nchumuru, and a sleeping room.

As regards locations and distribution of features related to subsistence activities, I predicted a total absence of kitchen structures inside Old Wiae house structures. Consequently features such as hearths, grinding stones and mortars were expected to be located in the courtyard of the house, and several of these were expected to be for communal use. In view of the predicted compact nature of the settlement, it was expected that many of the communal features be located at the periphery of the settlement. No fish-smoking ovens were expected. One final general prediction has been that most of the household objects were expected to be lined up along the walls of the houses.

Nchumuru settlement history in the Banda-Wiae area is reconstructed into four phases and indicate a gradual shift away from circular to rectangular forms of house structures. The balance of evidence suggests that the Nchumuru settled in family groups in the area in small villages of approximately four to five hectares. They lived in circular mud-house structures, two or three of which often formed a compound. The house structures clustered into quarters each representing a clan (*kabuno*) and having an ancestral shrine located in the center of the house of the head. Compared to the house forms in modern Wiae (Fig. 3), early Nchumuru houses (Fig. 4) did not possess that L- and U-shape configuration which defines a field of space that has an inward and outward orientation, indicating that over time the spatial potential of the settlement space was being invoked to make up for what the social resources could not provide.

Nchumuru social system is observed to operate at the individual, clan (*kabuno*), and phratry

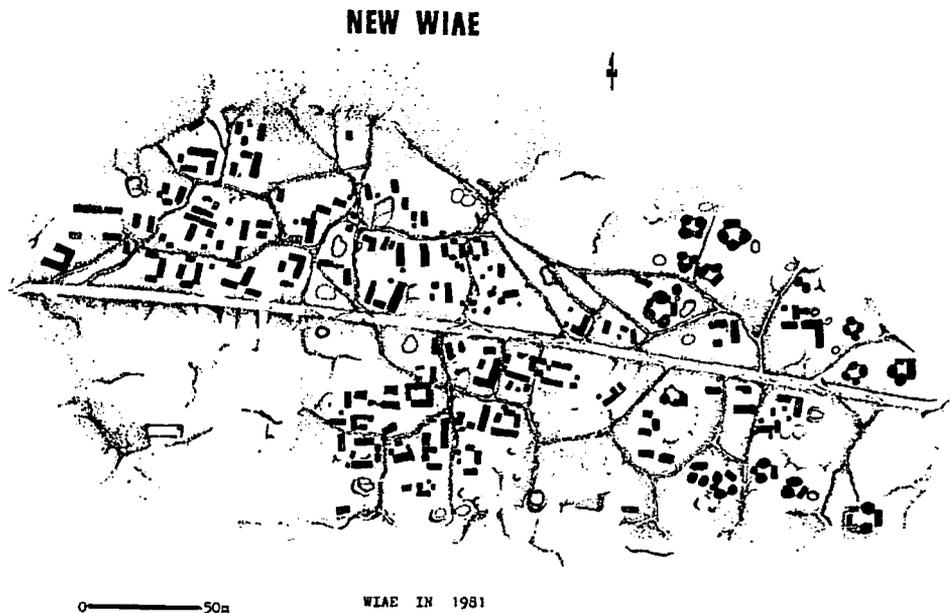


Fig. 3. New Wiae.

OLD WIAE RECONSTRUCTED

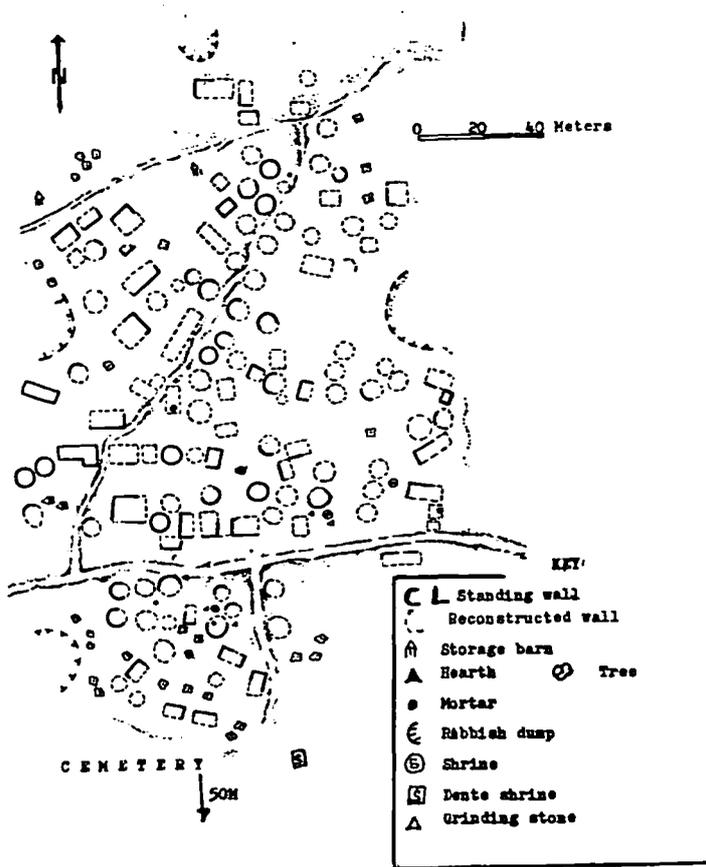


Fig. 4. Old Wiae reconstructed.

(kasuro) levels. Using a model termed the local rule (L-R) model of spatial behavior, my research demonstrates that each of these levels of behavior follows spatial patterns which can be explained by an understanding of the opportunities offered by the social relationships (social resources) and the environment (natural resources). It is generalized that the organizational rules of the Nchumuru are not as rigid as those operative in the physical world, but they exhibit sufficient regularities to be recognized and described firstly as Guang and then as Nchumuru, and also for explaining social and cultural continuities in the archeology of the Guang as a whole and of similar traditional societies in general.

A study of this nature is open and on going. All my generalizations are conditional and approximate. They apply to the stated conditions or assumptions and I am hopeful that it can be developed. The process is theoretically infinite.

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REFERENCES

- Agorsah, Kofi, 1981. Research on the use of space in a Ghanaian society. *African Studies Center Newsletter*, (University of California, Los Angeles), Fall: 12.
- , 1982. Spatial expressions of traditional behavior: An ethnoarcheological study. (E. Elster, ed) *Archeology at UCLA* (Institute of Archeology, University of California, Los Angeles), 2(6).
- , 1983. *An Ethnoarcheological Study of Settlement and Behavior Patterns of a West African Traditional Society: The Nchumuru of Banda-Wiae in Ghana*. Ph.D. dissertation, University of California, Los Angeles.
- Fortes, M., 1945. *The Dynamics of Clanship among the Tallensi*. Oxford.
- Hillier, B., A. Leaman, P. Stansall, M. Bedford, 1976. Space Syntax. *Environment and Planning B*, Vol. 3: 147-185.