CELEBRATING DIVERSITY:
An Exploration into African Contributions to Caribbean Residential Architecture
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ABSTRACT

The purpose of this thesis is to document, through observation and research, architectural elements of a culture that have contributed to the development of another. As such it represents a way of thinking about the impact of architecture on culture and of culture on architecture.

The lens for this focus is the contributions of African people brought to the Caribbean during the European Slave Trade (1520's--1860's). As it essentially was a world region where the influence of indigenous people was negligible due to their early demise and general lack of an extensively developed architecture, it may almost be regarded as a 'clean slate' upon which the Europeans and Africans devised an architecture based on climate, materials, and tradition modified by colonization/enslavement.

As climate and materials were generally similar to those found in Africa, tradition may be considered the most important aspect of this process and is the basis for this thesis and for the exploration of the following questions:

What did Africans do to contribute to the architecture of the Caribbean; how did they say, "We are here?"

What may have been present in the physical landscape, built and natural, that gave Africans brought to the New World any sense of familiarity of place in an otherwise alien environment?

What are some of their contributions that have survived, either through transferal or transformation, physically tangible or attitudinal, that are present in the Caribbean today?

In general, what do people do to affect the physical environment when they are in positions of social and economic powerlessness?

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CELEBRATING DIVERSITY:
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For teaching me that Love is the only true energy of the Universe,
I gratefully thank All That Is for my life and the will to continue.

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--- P. Bear
Dedication

This is lovingly dedicated to my grandmothers, Linner Adams and Adelaide Harris

and to Patricia Arredondo, Trudy Lawrence, Frank McNeil, and Anne Pelavin who, though listed alphabetically, hold no such in my heart for all have helped my growth in so many ways.
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This work is a part of a continuing exploration into the effects of the built environment on behavior and vice versa. Prior to coming to the Institute, I had spent several years as a social worker, planner, and builder. In my years as a social worker, I had the opportunity to work with people who had limited control over their environment; people who lived in public housing, prisoners in prison, youths on probation or in special care situations, adolescent pregnant women, etc. As a planner (education and program), I was fortunate not only to be able to devise the particular program but often to be able to design the physical environment for the activities. And finally, woven throughout it all, I was always a builder and through that had the opportunity to work with people who had economic means to impact and control their environments. Obviously, this is a wide range of people that covers almost the entire socio-economic spectrum in this country.

Throughout all my work the connection between a person's/people's world view and their relationship to the built environment (functional or dysfunctional) was always present and prominent. As a social worker, responses to informal surveys about basic needs/wishes always included "...a nice home..." and when asked for more information the responses invariably included "...a place where I feel like I belong." Granted, a sense of belonging is a social statement but when it is a reply to a question about housing I could only surmise that the architecture and the person/group did not match. As a planner, designing staff work and activity areas allowed me to quickly evaluate a particular scheme based on whether it fostered cohesiveness or disparity. This also seemed to be greatly dependent upon staff composition and whether their collective world view was one of being 'a part of' or 'separate from' (acting within or impacting upon). And, of course, building for people of means is always fascinating for how one structures the environment when empowered to do so is always more telling of who they are than years of conversation.
The architecture that developed in the Caribbean beginning in the 1500's is used in this thesis as an example for it would also have been appropriate to explore culture and architecture with any number of groups--Native Americans and Europeans in the U.S., pre-Roman Italy, Incan-Mayan Peru, etc. I acknowledge my limitations as a person of one culture exploring another and for that reason state that any errors or misrepresentations are not intentional but reflect my own understanding of a highly complex and subjective topic.

This document is another step in this journey although from a much larger, panoramic view. It is not primary research, for I have not spent years in Africa and so have had to depend on others to be my eyes and ears on that continent, and my short time in the Caribbean was only enough to gain an abbreviated appreciation of the region--qualitative rather than quantitative exposure. But I have experienced subjugation and I know dominion and have watched that dynamic unfold untold times in a society and its architecture. So I'm looking into the past in order to go forward with a greater understanding and appreciation of the role of architecture in society.
PART ONE: SETTING THE CONTEXT
INTRODUCTION

Architects, being human creatures, normally use forms familiar within their own culture regardless for whom they are designing, or, attempt a type of 'overlaying' by borrowing forms and motifs without a more complete understanding of the meaning of these elements. If the field of architecture is to remain a viable profession in other than monumental structures, it is important to either cultivate a greater variety of practitioners or to cultivate a better understanding of culturally based design parameters. One way to enhance present understanding is to look at what past people have done to preserve the built landscape of a culture in the face of great odds. In order to do this one must have some understanding of what constitutes culture in general, the particular culture(s), and what that culture as a whole may perceive as valuable within its architecture. It is also helpful to understand that what one segment of the population may say represents the culture may only be a reflection of that segment's contribution to the larger society, i.e., be aware/beware of the 'experts' and spokesmen/spokespersons.

Architects are trained to read the built environment, however, this reading often is only a comprehension of the formal relationships, materials present or predominant, and the general patterns of movement (human and mechanical) through that environment. This type of comprehension leaves the architect free from any responsibility for the impact his/her design(s) may have on the actual existing social order. Fortunately, this is changing although grappling with the social complexities of architecture remains a lower priority perhaps due to the increasing technical and financial aspects of the field. Still, this aspect remains primary for architecture is a very powerful symbolic language from which people take clues for appropriate behavior within the social and physical landscape. By understanding past cultural precedents, the architect may perceive what is of importance to the actual users, what changes in the architecture may be expected over time, and plan/design for them in a meaningful way that augments the development and empowerment of...
the user.

Architecture seems to impact people's view of themselves, the world and their behavior within it. If the architecture celebrates the inhabitants by supporting their cultural values, upkeep of the structure and surrounding territory and improvement in it is the normal response. If the architecture functions merely as shelter with no attendant augmenting or possibility of augmenting the culture through form or decoration, possible responses range from anti-social behavior, loss of cultural identity (or the identity becomes difficult to maintain), vandalism, and finally, to the possible total destruction of the architecture. For example, contrast any planned middle class community with a low income housing project (e.g., Oak Bluffs with Pruitt-Igoe).

This thesis deals with the changes in architecture that resulted from the confluence of two cultures in an unequal dynamic, and the obverse, the transferal and transformations of culture as it is expressed in architecture. The information in this document was drawn from a variety of resource material representing several disciplines (architecture, sociology, anthropology, cultural geography, psychology, et.al.) and from field observation and family folklore. The following two chapters set the theoretical premises and basic context with the remaining chapters presenting more specific architectural information. Within the chapters dealing specifically with architecture, the African precedents are expressed first followed by Caribbean examples and their transformations over time.
Chapter I: COLONIZATION/ENSLAVEMENT

Structure on Rt. 187 between San Juan and Loiza Aldea, Puerto Rico.
COLONIZATION/ENSLAVEMENT

Culture exists primarily as a conceptual model of the world. It is as John Habraken states in Notes of a Traveller (On Research):

"...It is to a large extent what makes them a tribe. The interpretation of the accumulated facts in a theory is what makes a culture. The map of their world holds them together, while at the same time it makes individual movement possible as well as easy communication."

[Habraken, 1981, p.2].

In this respect it is a very dynamic entity that allows for individual expression, input, and flexibility; yet because it encompasses a mass consciousness, a sense of comparable distinction remains. It is this distinctiveness that makes possible the identification of different cultures. Brazilian anthropologist, Darcy Ribeiro writes in "Civilization and Creativity," a contribution to Latin America In Its Architecture, that:

"Culture, viewed critically, constitutes a conceptual model of the world constructed by each human community as the very condition of its being and existence. This model reflects the previous experience of the society as well as its structural characteristics...the stratification of classes, conditions of dependence appear as differentiated variants of that culture. Only in the case of a society that is ideally homogenious, and for that reason simple and rudimentary, does culture take on the configuration of a coherent and uniform entity. In all other cases...cultures are always complex entities, differentiated and made dynamic by intense, traumatizing processes."

[Segre, 1981, p.27].

As one can see, several levels, scales, of contribution are important in the formation of such an entity: individual, subgroup, large community, and interaction with others with a different conceptual model. For the sake of clarity in this document only the last two levels of identification will be discussed in order to bring forth the more prominent elements of a culture(s), to make comparison more clear, and to lessen the need to introduce a more convoluted, highly qualified/limiting language. For these reasons only the most prominent aspects will be discussed although it is realized that these may be a gross oversimplification of an extremely intricate process. However, by
presenting information in this manner it is possible to see the major effects of the interactions between two cultures when their dynamics of power are unequal.

Paul Bohannon writes that "...all elements of a culture are encoded twice, once in reality and once in the mind." [Vlach, 1978, p.2]. Richard Hull supports this by stating that "...Architecture...is the making visible of the 'ethnic domain.'" [Hull, 1976, p.76].

This encoding process enables the stabilization of a concept by allowing realization in tangible form of an intellectual/emotional/psychic concept. This process works in the reverse also; that what one observes in the physical landscape is abstracted through the symbology of language into a functional method of understanding and locating oneself within the physical realm. Thus it operates in a cyclical manner and any disruption in that cycle makes it possible to fundamentally alter a people's concept not only of themselves and their place within the universe but also to alter perceptions of the universe itself. This is extremely important in understanding how colonization and enslavement are possible,
for those forms of domination can only be temporary unless the above stated conditions are incorporated into the psyche of the subjugated group. In order to do so it is important, if not imperative, to affect the language of a group and its architecture.

Colonization and enslavement are closely related. In fact it can be seen that the only difference between the two concepts is a matter of semantics; that the word colonization is often used by the intruding group while enslavement is used by the subjugated people. Inherently, both are expressions of power, real and perceived, as a means of affecting the 'shared map' and social/physical environment. Throughout, these terms will appear but more often dominant and subjugated people will be used to describe the groups involved as this writer is aware of the internal images and connotations conjured that ultimately affect the attitude through which the information is filtered.

Colonization/enslavement has two basic forms: 1) The dominating group intrudes upon an indigenous people and overlays a new cultural map upon a pre-existing one; and,
2) The intruding group forceably removes people from their territory into an alien world. In the first, the process is usually slower for the establishment of a new culture in an existing physical landscape must be done by dismantling old structures (both physical and mental) and then replacing them with new models. No matter how immediate and profound the initial intrusion (barring the almost total destruction of people and buildings), the process must be generational for memories, language, buildings, and the subjugated people's actual location remain.

In the second form, the ability to obliterate a culture is comparatively less difficult for in the relocation two important elements, place and buildings, are removed. It becomes even easier if the subjugated people come from several distinct language areas. Power over, control, is not as difficult for the captured people are confused by a new environment and emotionally depressed, a condition amplified by the inability to verbally communicate in any meaningful way. A new cultural model can then be implemented based on the 'map' of the dominant group.

Areas of slavery (African and Indigenous) in the Western Hemisphere, 1500's-1800's. See Appendices for further graphic distribution.
It may be said that three aspects must be present to enslave a group: physical dominion/subjugation; mental degradation; and a re-ordering of the physical/built environment.

With the European Slave Trade that began in the 1500's, millions of people from Africa were forcibly brought to what has euphemistically been called the 'New World' (new to whom?). This area consisted of the eastern and southern part of North America, Central America, the Caribbean islands, and parts of South America. It was the most massive relocation of any racial group by another in that during it over seven million people were brought to the region. (Estimates range from Mintz's seven million to Gosner's fifteen million). Of those, approximately 2.5-3 million ended up in the Caribbean between the first decade of the sixteenth century and the end of the nineteenth. [Mintz, 1974, p.46].

How is it that so many people could have arrived in a new location and so little of their original culture(s) remain? The problem is twofold in that much may have remained but been ignored/suppressed/translated until it either disappeared or became attributed to the dominant group, and, that the subjugated people had few mechanisms at their disposal to perpetuate their 'world map'.

Subjugation of one group by another has always been the result of economics. Enslavement/colonization may be presented in terms of the desire to better the lives of those under attack or in terms of furthering the influence of a religion (codified cosmology) (1), but the fundamental fact remains that no profit = no war/no domination. In the Caribbean and elsewhere, Africans were brought in efforts to increase the exchange of goods with the respective 'home' countries. Gold, tobacco, and sugar were the goods and Africans were incorporated into the means of production only after the indigenous people either died from imported diseases, violence, or ran away. The numbers transported attest to the immense scale of production. West Africans were brought because they were easily identifiable and were primarily agrarian, which therefore reduced the need to teach them cultivation techniques. (This actually worked in reverse as the enslaved taught improved cultivation methods to the
slavers [Vlach, 1978, p.8] although without any real benefit to themselves other than less inately frustrating work). Religion was used to morally justify such inhuman behavior and its use/effect was seen in the mental degradation of the enslaved.

Mental degradation is the second aspect of subjugation (2). In order to affect the internal values of a culture it becomes necessary to call upon a higher power. That higher power belongs to the dominating group and visible physical differences is used to heighten the power image of the dominant and to lessen that of the subjugated. This gives rise to mental degradation through racism; by assigning negative images of self and abilities, the values held by the enslaved gradually become eroded under such intense attack. Additionally, a sociological point must be labeled as biological or (preferably) metaphysical. Therefore, with the help of religion, the subjugated can never achieve parity, discrimination is seen as fundamental, and a foundation is laid for the immutability of this lifetime if not all eternity. These elements, coupled with severe physical and economic limitations/abuse will eventually make a people forget who they are.

Ribeiro speaks of cultural obliteration in this manner:

"Certain socioeconomic conditions represent such extreme cases of limitations on cultural creativity that the society subjected to them is deformed, oriented in directions opposed to affirmation and survival. In these circumstances the society itself frequently disappears, not through the physical extermination of its members, but by their subjugation to the oppression of a foreign group that views them as enemies, and can therefore exercise a despotism more fanatic than would be possible within a homogenous society. This is the case in the process of loss of culture in which a population, or a part of that population, is subjugated and used by another as a mere source of energy for its system of production. Torn out of its context, that population loses its culture as a necessary condition to its integration into a new cultural construct. The first result of the confluence with the dominant society is the eradication of the original culture; later a new and inauthentic cultural construct--a spurious colonial culture--is created." [Segre, 1981, p.25-26].
But there were too many Africans present in the New World, especially in the Caribbean, to totally eradicate their cultural contributions. Many chroniclers have written of the profound influence of Africa upon Caribbean dress, music, and even the persistance of religious forms (3). However, there is little written about the third aspect of subjugation: the re-ordering of the physical/built environment.

As architecture is perhaps the second largest thing that humans do on a continuing basis (language as the first), what can be expected as the result of subjugation and repression of a group's physical model of the universe? The most major impact is that the original models of the less socially powerful group become modified or obliterated as the dominion proceeds. This process continues as the socioeconomic factors increase until the subjugated group, quite literally, are no longer living in their own houses. This reflects the architectural order in which the physical landscape changes.

First, it is important to claim the monumental architecture of a group either by reassigning the rights to its use by the

15th century Timbuctoo. Note both round and rectangular forms and their relationship to volume and form of mosque in background.
invading culture or by constructing new ones whose scale and position within the built environment take precedence over the older forms (i.e., the Great Mosques of Djenne and Timbuctoo with the introduction of Islam to Mali). Secondly, it is necessary for the overtaking culture to learn the symbolic meaning of the architecture (or to just learn that certain elements hold significant meaning) and then either squelch it by forbidding its usage or through reassigning those symbols by propping them to have been derived by or from their own culture.

The third, and most important aspect was described in the beginning. It is only when the housing models preferred by the dominant group become the standard for the subjugated that the process is completed for it is one thing for the monumental architecture to reflect the values of a dominant group and quite another for the actual interpersonal/familial modes of relating that are augmented and reinforced by residential architecture to reflect this also. One can choose whether or not to identify with an architecture to whom access may be limited, rigidly controlled, or restricted but to choose not to identify with one's abode only increases inner and social alienation. When it can effectively determine the basic house plan, the dominant group has effected control of a culture (4).

But it is not a human trait to willingly give up power in any form, it has to be taken. When it is taken away, the will to impact the physical environment continues as a means of warding off the individual and/or group insanity that may result as the effect of a destroyed 'map'. Five basic responses to this operate in the architectural realm.

First, the enslaved, oppressed, group simply refuse to go or cooperate in any manner with the aggressor. This resistance, whether passive or active, is usually met with total destruction (if possible) of the person/group and their built environment. Secondly, if the person/group survive or more is more valuable to the aggressor alive, then the efforts are directed toward sabotage. Not only are there numerous accounts of slaves poisoning the slaver but also of burning plantations or sabotaging the structural
integrity of buildings or devising other methods to impact the architecture. For this reason alone the opportunity to build was often denied to slaves for it gave them access to weapons and allowed them to visually impact the environment; two very empowering things.

Another counteraction is a type of architectural 'double-speak' whereby the subjugated keep alive the important symbols co-opted by the colonizer through the education of new generations to the original meanings. This is a way on continuing the culture by verbally claiming something in the built environment. The risk to this is that if the 'folklore' link becomes broken, generations of information become lost and almost totally irretrievable. This was another reason that it was important to destroy the language(s) of the enslaved; no communication=no memories=no past=no alternative identity=a self view only as a slave, a commodity, and a tool of production (5).

A fourth counteraction is the modification of the architecture and architectural meaning. This reflects an attitude of adjustment to new conditions and also a way to keep some...
meaning rather than to lose it all. As an example, the African custom of decorating the main entry zone of a house remained although the type of decoration may have changed to reflect the limits allowed by the dominant group (i.e., no snake motifs or 'devil' masks).

The ultimate counteraction, however, is similar to the first. A person or group denies the aggressor the right to determine the manner of their destruction by doing it themselves when it becomes clear that it is the only alternative to enslavement. Three million Africans were brought to the Caribbean and yet only approximately 1.5-2 million were alive at the end of slavery. (Estimates vary according to source but the numbers indicate an overall net loss of lives). Over a period of three hundred years, it would be normal for the original amount to have multiplied at least twice rather than decrease by half. This reflects the harshness of the condition of enslavement. It also reflects that the accounts of suicide and infanticide have been grossly minimized.

This thesis documents, in an admittedly abbreviated manner, what has remained of the architectural contributions by Africans to Caribbean architecture. These contributions are not to be found in the monumental structures of the region but in the building over which they could exercise the most control: the housing.
SUMMARY

Whether a group can be said to have been colonized or enslaved is a matter of perspective and highly dependent upon the orientation of the observer for embedded within that perspective are attitudes toward not only the contributions of a group to the new society but whether the ability to contribute exists. It has been seen that for a group to be subjugated three aspects must be present: 1) a break in the mental encoding/reality cycle; 2) mental degradation enforced by whatever means possible; and, 3) alteration of the physical/built landscape. There are also several counteractions to attempts at subjugation as it is not a human trait to willingly give up power. Some of these are refusal, sabotage, a type of double-speak (cultural maintenance by folklore), modification, and destruction. Of these counteractions, all but refusal have a direct impact on the architecture and any assigned architectural meaning. This gives a greater emphasis on the third aspect of subjugation, the alteration of the physical/built landscape, as important if a dominant group is to successfully overlay their conceptual map upon another.

The concept of culture functions on several levels of which only two, the large community and interaction with other groups, are to be addressed in this document. Any strong interaction will have an effect on both groups as a culture progresses or maintains itself by encoding information in a cyclical manner and any disruption or new input into that cycle will alter the process. This process of cyclical encoding was profoundly impacted with the colonization/enslavement dynamic of the Atlantic slave trade which produced a new culture and architecture in the Caribbean.

To be successful in colonizing/enslaving another group it is essential that the invading one claim the monumental architecture by destroying the existing models and/or claiming it as their own. They also may learn the symbolic meaning of the architecture (monumental and other) and reassign that meaning or totally squelch it by forbidding its usage. And, finally, to be totally successful, they must in some manner change the housing and impact
the daily living patterns of the subjugated group.

In the arena of the Caribbean one may ask are there any examples of contributions by Africans to the architecture and/or how did so little of the African contributions remain? Again, it is a matter of perspective for although the first question is moot (there are examples of African contributions to Caribbean architecture), the second question is directly related to conization/enslavement and that is where the orientation of the observer is critical for in the world of architecture there are only a limited number of forms appropriate for housing in a non-technological society and assignment of meaning is always subjective. However, the question may be answered by understanding that: 1) the enslaved Africans were in an environment with a similar climate and building materials even though they had limited ability to perpetuate their overall world 'map'; and, 2) meaningful contributions of a subjugated people are often ignored or reassigned to the dominant group.
Chapter II: THE CARIBBEAN REGION

CARIBBEAN

The region of Earth known as the Caribbean is an area of more than 2,000 miles of sea located to the south of the continental mass of North America, north of South America and east of Central America. Today it contains perhaps fifty separate societies on as many islands. [Mintz, 1974, p.46]. The climate is tropical and the islands range in size from the few square miles of St. John in the Virgin Islands to the 44,000 square miles of Cuba.

The islands represent a wide range of cultures and architecture yet there is present within the entire region a particular sense of overall cohesiveness, for regardless of each island's present socio-political climate, they all share a common past of colonization and enslavement. That past coupled with the region's generally benign climate enhances the possibilities for similarities in residential architecture.

The demise of indigenous societies began when Columbus decided to build a settlement on Espanola (today Haiti and Santo Domingo) and reportedly left thirty-nine crewmen from the Santa Maria. [Mintz, 1974, p.46]. Other European societies soon followed Spain's example, drawn to the area by tales of gold and other possible riches. Prior to this time, there were no European overseas colonies and as a result they needed large quantities of laborers. From general research it has been found that, at first, these were the indentured servants, convicts, petty thieves, et al., who were sent to the region as well as the native people who found themselves drawn into this morass.

Gold, however, was never found in great quantities and the island's production soon turned to the exportation of tobacco and sugar. This necessitated an even larger labor force and by the end of the sixteenth century, slaves from Africa were being brought to the islands in ever increasing quantities as the native people were pushed to the point of extinction.

Cuba, in 1886, was the last to abolish slavery, more than 380 years after it began in the Antilles. "Denmark had made slave trading illegal in 1802, England in 1808, Sweden in 1813, France in 1814, and Spain in 1820; but the illegal trade continued at least until the 1860's, and free (or freed) but contracted African laborers were also imported during
much of the nineteenth century." [Mintz, 1974, p.49]. Hence, the region presents a unique opportunity for this type of study as these people replaced the indigenous people rather than augmented the overlaying process of cultural change (which is what occurred in the continental areas).

The architecture of the region is a reflection of this replacement process. Although African and Caribbean empirically based building techniques and attitudes share similarities that are to be found among tropical cultures, it is the continuation and modifications of these techniques and attitudes that resulted from the social counteractions, augmented by climate and environment, which enabled Africans to make architectural contributions in the residential architecture in the face of the immense social stress imposed by enslavement. The architecture of the region reflects the stress/counteraction cycle and may be one reason that such a term as "Caribbean Style" [Slesin, 1985] can even be applied to the region's architecture (1).

Caribbean architecture reflects the colonization/enslavement period of its entry into world consciousness. It was born of the confluence of two primarily different conceptualizations of the world, European and African. (Although other groups, mostly Asian, enter into this mix they did so after the slavery era when the basis for the present day Caribbean built environment was formed). This meeting of worlds can be most pointedly noted by observing the architecture of the main cities and that of the villages and surrounding countryside.

The architecture of the cities reflect the attitudes of the dominant group(s). They are based on European city plans and the architecture feature designs that augment the conceptual views of the home country. The particular scale shows them to be colonies for their politically astute designers never constructed any monumental buildings that rivaled those of the main country since the colony's reason to be was to economically enhance the coffers of the home country, not to establish themselves as equal entities. The scale, however, did need to symbolically demonstrate the dominance/subjugation dynamic and as the cities grew from small trade and defense areas into
cultural centers, the scale and building type reflected this transition and resulting enhancement of power by the dominant group (2).

The vast majority of the people did (and still do) live in villages and surrounding countryside. This reflects the plantation, agricultural economy of the Caribbean. It is here that the residential building types can best be observed for African contributions as this is where they resided and could exercise whatever modicum of power to influence the architecture.

The hut forms the basis for residential architecture in the region. As such it is a part of the "Caribbean Garden" [Berthelot and Gaume, 1982, p.63] (4). The house had to respond to climate and economics and it had to not make a too offensive statement to the slaver. As it was a part of the production process, it had to be moveable yet not easily destroyed by the environment. To this end the building knowledge of the shifting cultivators of West Africa was employed. Yet the hut could not be too African or make too great a cultural statement. This last aspect of muting a cultural statement has enabled the contributions of Africans to New World architecture to be obscured and ignored for centuries for it is not blatant in the way that Old San Juan is instantly identifiable as connected to Spain or Martinique to France.

Old San Juan. Las Monjas Street at night.
PUERTO RICO

Puerto Rico, an island approximately 100 miles long and 35 miles wide, is located to the east of the Dominican Republic and to the west of the Virgin Islands. It is the fourth largest of the Antilles Islands and has the second longest history of European and African settlement as its position in the Caribbean was quite advantageous for Spanish military defense of the region. [Plaque at El Morro, San Juan, Puerto Rico].

The Spanish, through Ponce de Leon, began settlement in 1508 after gold was discovered to exist on the northeastern part of the island. [Tovar, 1973, p. 18]. Two years later in 1510, the first African slaves arrived having been brought to the Spanish by the Portugese. [Tovar, 1973, p. 29]. It was not until eleven years later that Africans were brought to Puerto Rico in great numbers, however, as in the interim native people (Taino and area tribes) were used as the primary labor force. Federico Ribes Tovar states in A Chronological History of Puerto Rico that: "It was not until 1521, however, that the importation of blacks actually began, but by 1530 the slave trade was plied freely in Puerto Rico, as the Indians rapidly died out and new hands were needed to work the land." [Tovar, 1973, p.29]. This replacement of indigenous people with Africans continued well into the 1860's when importation ceased. It was not until 1873 that Puerto Rico abolished slavery, an act that did not end subjugation, as the 'freed' persons "were obligated to sign contracts with their former owners...for a period of not less than three years..." [Tovar, 1973, p.324].

During this interval of 363 years, almost a million Africans were brought to the island to work on the plantations. Many of these achieved a somewhat free status and worked as artesanos/craftsmen as carpenters, smithies, and masons. The census of 1860 reported that Puerto Rico had 580,329 inhabitants; 300,430 white, 241,015 free "colored persons" and 41,736 slaves. [Tovar, 1973, p.291]. As can be seen, the white population exceeded the total "colored" (black and mulatto) by only 17,679. Evaluating this information solely on its numerical basis, one would assume that African influenced architecture would be more prominent but other
factors bear a greater influence.

The effects of the mental degradation aspect of enslavement cannot be underestimated. One element is to convince the subjugated of the undesirability of themselves and their history/'map'. This has been so pervasive that today most black Puerto Ricans do not identify themselves as such but as Puerto Rican then Latino(a). [Lassen, 1986, Interview]. (Also see Chapter I, (5)). Attempts to gain information on family traditional building practices during interviews was met with blank stares if the words African, black or Negro were used to allude to the interviewee's obvious racial heritage. [Author's field notes]. Nonetheless, African based design and building practices exist on the island, it was just not possible to gather sociological information on its dispersal and perpetuation.

The impact of environmental factors also have played a role in reducing the impact of the numerical information. Throughout its history, Puerto Rico has been subjected to numerous hurricanes, earthquakes, and fires (both in the cities and the smaller villages). These factors plus the natural lifespan of wood has greatly reduced the available examples which may have been more prominent in the physical landscape. Additionally, there have been several social movements, including slave uprisings and plantation burnings, that have nearly erased a critical link in the architectural discovery/observation/documentation chain.

Puerto Rico's architectural/cultural history (5) is one of the most fascinating transformations in the Caribbean and the area of Loiza Aldea on the island's northern coast represents an example of the confluence of cultures showing the architectural implications.
Loiza Aldea is an area bounded by the Rio Grande River (west), Highway 2 (south), the town of Rio Grande (east), and the Atlantic Ocean (north). It contains the coastal village of Loiza and is approximately ten miles west of San Juan. The town of Loiza began as a Taino settlement at the mouth of the Rio Grande which was later settled by the island's African descendants and Europeans. Prior to the nineteenth century it was a small village of only seven to ten residences and served as a trading center for the surrounding plantations. It has always been an area of black settlement and is second only to Santurce as being the first black town. [Morales, 1985, p.82].

Que Pasa, Puerto Rico's official visitor's guide describes the area:

"Loiza's history dates back to the sixteenth century...Loiza retains one of the highest percentages of African descendants of all island towns. A large number of slaves were brought here to pan gold in the river and to work sugar cane fields; other blacks found refuge along the coast after an eighteenth-century decree freed all non-Spanish incoming slaves." [Que Pasa, 1986, p.43].
The basic town plan was linear and differed from other Spanish settlements of the time. Although the regular system of a town plaza surrounded by governmental and church buildings remained, the residential area, rather than radiating from this began a north-south linear pattern that followed the river's course, as much of the produce travelled to San Juan via the Rio Grande and the Atlantic Ocean.

Loiza also has the oldest parish church on the island which began in 1645. According to descriptions, it was a wood frame building with plaster walls and a thatch roof until its renovation in the early 1800's when its roof was changed to vault construction. [Rivera, 1986, Interview].

The housing prior to 1820 was primarily madera and paja (wood and straw thatch) although tabla (boards) were occasionally used. Records indicate that there were 10 casas, 16 bohios, and three carpenters in the village at that time. [Morales, 1985, p.35]. It is not clear what constituted the difference between a casa and a bohio; whether it is the type of construction (wood poles or board siding), or plan type but it does appear that the
designation holds an implication of social status and the numbers of each are reflective of the racial distribution of Loiza at that time.

A new town plan was devised in 1821 which reflected the Spanish system of a plaza surrounded by a grid of residential housing. The town grew from the late 1830's until the early 1840's when the region's governmental center was moved closer to the main road. [Archival Records]. At that point, the town's development ceased and the architecture remained much the same, madera and tajamanil (raised construction), until the building revitalization program of the 1950's.

Loiza was chosen as the place to focus the field observation for the area's long history of extensive settlement by African descendants coupled with the town's economic isolation that began in the 1840's and its yearly festival based on African traditions, 'La Bomba', made it ideal for possible examples of African building traditions that may have survived. These traditions could then be used to augment documentation in other areas. Senora Pica's house is used in this thesis as an example for it incorporates several African based building traditions and attitudes although it is by no means the only example of its type found in Loiza.

Senora Pica's house. The facade gives few clues as to the internal plan.
SUMMARY

Overall, the Caribbean region has a consistency of architecture due to its cultural and economic past. It is a region where native influence was soon silenced, to be replaced by European and African concepts. It was a colonization/enslavement region whose architecture reflects its economic satellite basis. Additionally, the climate played an important part in allowing for the continuation of African based architecture as it is similar to that of West Africa.

Puerto Rico was among the first of the islands to be colonized and although its architecture reflects the dominant group, examples of African contribution have been found to be present. It was this author's basic contention that if examples of African design could be located on this island after several centuries of Spanish (and later U.S) dominance, they, by extrapolation would be present throughout the region. The architecture of Loiza Aldea and other coastal villages showed this to be a workable concept.

The questions for this thesis remain:

What did Africans do to contribute to the architecture of the Caribbean; how did they say, "We are here?"

What may have been present in the physical landscape, built and natural, that gave Africans brought to the New World any sense of familiarity of place in an otherwise alien environment?

What are some of their contributions that have survived, either through transferal or transformation, physically tangible or attitudinal, that are present in the Caribbean today?

In general, what do people do to affect the physical environment when they are in positions of social and economic powerlessness?
PART TWO: THE ARCHITECTURE
Chapter III: PLAN

Fruit stand. Rt. 187, Puerto Rico.
COSMOLOGICAL FACTORS

There is a great variety in the architecture of pre-colonial West Africa in plans, structural systems and decoration which seem dependent upon the prevailing cosmology and environmental conditions. It is clear that the architecture is based on a cultural conceptual map of the universe which holds that the earth is a living entity as the architecture appears to be derived from and fully incorporated into the surrounding natural environment. This factor prevails and sets the basis for the development of a binding cultural determinant. By viewing the numerous cultures in this manner, a basis for tracing African contributions in the Caribbean and also in contrasting African and European spatial systems can be made.

There appear to be two primary conceptual models of the universe present on earth:

1) That the earth is a living supreme entity and as such her cycles are of cosmic significance; that human beings are a product (children) of this entity whose birth-life-death cycles follow those of the earth (this allows for the consideration of ancestors, those 'dead', to still impact the lives of the living); the group is more important than the individual; and, that one is to live in accordance and harmony with the earth.

2) That the earth is to be subject to the will of humans, that it is not a sacred entity; that the conditions of life are temporary; that the focus of this life is to prepare for the real life in the here-after; that the individual is most important; and, that living in accordance with the earth is far less important than living in accordance with future expectations of ways of being.

These two fundamentally different conceptual constructs form the basis for cultural development and its translation into architecture (1).

In the face of such a great variety of architecture in West Africa, what becomes most
Grass steppe
Savannah--dry
Savannah woodland--moist
Tropical forest--savannah mosaic
Moist tropical forest

Form
1 Cylindrical; circular or oval plan
2 Cubic; square plan
3 Cubic; rectangular plan

Roof
4 Conical
5 Flat
6 Pitched
7 Hipped
8 Undifferentiated structure
9 Ogee
10 Acorn section

Materials
a woven mat
b wattle frame
c mud wall, mass or adobe
d reinforced mud
e bamboo or pole frame
f grass or reed thatch
(now often corrugated iron)
h stilts or piles

Distribution of housing types in West Africa.

clear is that the conceptual map is based on a world view of the earth as a generative, active, force and that attention to the earth's cycles is paramount. Throughout the entire West African region, a square, or nearly square, unit plan dominates. The circle is also a predominant plan type that, perhaps, has dominated western conceptualization of West African architecture. These two shapes correspond to abstracted conceptual models of the universe and are seen repetitively throughout (2). (For example, the square in plan Dogon granaries with conical roofs, the myriad round houses of the southern Sudan, the rectangular two unit basic house of the Yoruba, Hausa, Ibo, Mandingo, Bambara, et. al., etc.)

This conceptual model is most important for in it are incorporated environmental and social factors that influence the transformations of an architecture. It is nearly impossible to discuss whether the cosmological basis preceded the environmental response or whether the cosmological premise resulted from empirically developed structures. However, it is possible to acknowledge their
interconnectedness and to trace the results. A cultural given that results from the 'earth as supreme life force model' is that every person is related and that the particular bonding of families is only a matter of scope. Within the private family dwelling this need for personal spatial distance/closeness narrows to become almost non-existant, which is a factor that augments the view that a hallway is a superfluous spatial device. Privacy is gained by visual rather than structural means. Also, the territory surrounding the house is seen as an extension of the family space and, in tropical climates, may be used whenever extreme privacy is needed (3). From a functionalist perspective, the interior space of the dwelling is used for sleeping, personal storage, and, in inclement weather, for cooking. Therefore, in societies where year round agricultural production is the primary focus, the house only needs to be large enough for these functions. Also, with a benign climate, there are no climatically enforced periods of interpersonal closeness which contribute to overcrowding and resultant behavioral responses.

According to several anthropologists and cultural geographers, most West African societies of this time functioned collaboratively and a cosmology based on natural cycles augmented and perpetuated this type of societal functioning. Ritual burial practices based on the sun's path and the positioning of doorways that enhance ventilation are but two of numerous examples that also have cosmological and religious significance in the region. Another is the practice of building a house within a single period of daylight as it is thought that evil spirits will enter a house if it is not completed by darkness. A house not completed within the time frame is rendered useless and therefore, a waste of a community's time and energy. [Denyer, 1978, p.93].

Most rain forest houses are constructed in a day although the family may have spent several weeks preparing the materials. [Denyer, 1978, p.93]. It is a communal affair and progress rapidly as the houses are usually similar, if not identical, in design due to the general social egalitarian attitude (chief's and mystics excepted). In an agrarian society, the housing needs were remarkably similar whether the society was sedentary or shifting.
House under construction in West Africa. The entire community assists in the actual building although the residents may have prepared the materials for several weeks prior.

cultivators. Since many activities could be performed outside, a two or three room house was suitable. Also, a 10'x 20' house can be constructed in one period of daylight. This practice also enhances the sense of community while allowing for a construction time that lessens the time away from food production labor. Not only does a belief such as this encourage social cooperativeness, it also presupposes that the architecture will remain constant as the builders work under the pressure of a supernatural consequence. This may lessen the desire to alter an empirically proven design. As Equino of the Ibo tribe stated in the eighteenth century: "Everyman is sufficient architect for the purpose. The whole neighborhood afford their unanimous assistance in building...and in return receive and expect no other recompense than a feast." [Denyer, 1978, p.4]. Only so many people can build at once and time limitations will determine how large a structure can be built in a day's duration in a non-technological society using lashing and other basic joining techniques. The society determines the type of needs to be housed and the goddesses/gods, climate, and materials determine the time frame, forms, and sizes.
AFRICAN PRECEDENTS

From Senegal south along the Guinea coast to the Zaire River basin, exists an area of fairly consistent tropical rain forest. This zone reaches far inland in Central Africa almost to Lake Victoria. The area generally receives over 60 inches of annual rainfall with consistent morning and nightly temperatures of over 85 degrees F.

In this area of over 4,000 linear coastal miles there also exists remarkable consistencies in the agriculture (root crops such as yams and cassava) and musical systems (4). It also features a fairly consistent architecture which is often called the "gable roofed hut" [Vlach, 1978, p.124]. This housing consists of two adjoining rooms as the basic unit with a 2'-3' overhang for shade and rain deflection. In areas where flooding is prominent, the house is elevated and a third room or partial enclosure for cooking is added. In this zone, the rectangular house with gable or saddleback roof appears to have been the most prevalent housing form for centuries. This area is also the one where the overwhelming majority of Africans resided who were taken as slaves.

In such a climate physical comfort depends upon the dissipation of heat from the body to the surrounding environment and with such high humidity, ventilation through the building becomes crucial. An elongated plan with a single row of rooms which face the prevailing winds and has large openings suit this particular climatic need especially well.

Also within this large area of rain forest there exists a consistency in room dimensions. According to Vlach in Afro-American Tradition In Decorative Arts, "...9'x 9' units are continually used in the Bight region of Benin with only a small variation to 10'x 10' and 8'x 8' in Angola." [Vlach, 1978, p.124]. This African based dimensioning remained constant when brought by African builders to the New World and appears to have held true as tradition for black builders into the 1950's (if this writer's family may be used as an indication of such). Reasons for this particular dimensional preference may be strongly culturally based for such a room arrangement provides for communal-type spatial encounters and the lack of a hall implies that the concept of
privacy holds a different meaning (5). It may also be a result of cosmological factors or it may have developed for technological reasons or some combination of the above.

Whether this particular dimensional system is an aspect imposed upon the architecture by a culture or upon a culture by the environmental requirements can only be speculation. Whatever the reason, room dimensions, usually square in plan, averaging 9'x 9' ± 1'-2', arranged in an adjoining linear pattern, crossed the Atlantic Ocean with Africans in the European Slave Trade.

Plan of Yoruba rural village (above) and Ashanti village (right). Note that the basic module is square in plan and that all extensions to it are linear. The resulting rectangular forms may be arranged additively into courtyard or L-shaped schemes but all arrangements maintain the linear attitude.
CARIBBEAN PROTOTYPES

Slaves who first arrived in the Caribbean were primarily from areas dominated by the Yoruba Tribe. This information is consistent from several sources but a numerical account has only been found in Vlach stating that:

"...In any given decade between 1760 and 1790, from twenty-eight to forty-two percent came from areas dominated culturally by the Yoruba; slaves of Angola-Zaire origins, the next largest group, made up between thirty-two and thirty-seven percent of the total imports...The Yoruba architectural repertoire is quite extensive, with structures ranging from common houses to palaces. But despite the variety, all of the buildings are based on a two-room module which measures 10 x 20 feet." [Vlach, 1978, p.125].

This two room house with a gable roof appears as the most common form of slave quarters and was generally built of the same wattle and daub construction and roofed with thatch. The similarity of environments may explain the similarity in materials but what is most notable is that these buildings continued to conform
Arawak bohio with timber column construction, woven vertical infill, thatch roof, and small porch under front overhang. This type of dwelling consisted of a singular undifferentiated interior space.

to the same 9'x 9' ± 1'-2' plan dimensions. According to information in Kaz Antiye, the basic plan unit present in the Caribbean during slavery was based on the '9x 9' module. [Berthelot and Gaume, 1982, p.80 and p.108]

Throughout the period of slavery, this basic house form was modified through what may be presumed to be a three-way interaction of the indigenous people who survived, African slaves, and Europeans. The Arawaks (also the Caribes and, to a much lesser extent, the Taino) used a rectangular form with gable roof, called a bohio, although usually with only one undifferentiated interior space and high, small windows. What is most notable about these dwellings (bohios) is that the door is placed in the gable end and a small porch made under the roof overhang. The Europeans, in later years, contributed to the construction techniques by a more extensive use of milled lumber, fired brick (when available), and the later use of metal roofing. What resulted from this interplay of cultures was a building type that in Haiti is known as the caille. This particular house form has the door in the gable end (Indigenous), the basic 10'x 20' dimension (Africa) and,
today, is made from milled wood (European).

In Africa most of the cooking was done outside or under a partially enclosed addition. As the convergence of cultures occurred, this partial room became more formally incorporated and resulted in the typical three-room arrangement with a small porch that in the U.S. south became known as the shotgun house.

Haitian caille. The plan (above) and construction (left) of this dwelling is virtually identical to Yoruba prototypes. A small porch has been added to the front and the entry changed to the gable end.
GENERAL PLAN TRANSFORMATIONS

As stated prior, the basic unit that arrived in the Caribbean was 9' x 9' ± 1'-2'. Essentially square in plan with openings in all walls for ventilation, it was easily extendable and could be roofed by either a simple gable, cone, or other shapes. This unit was also found among the indigenous tribes of the area such as the Arawak and so its use as the standard housing unit was reinforced by two cultures. The unit was doubled as the need for sheltered space increased and as a reflection of the cultures present.

At this point, it would be a gross misrepresentation to omit noting that the basic two room configuration was also known and used in European areas prior to its use in the Caribbean and U.S. south. In the British Isles this elementary form was known as a hall-and-parlor house which was the primary housing of much of the Caribbean and U.S. folk architecture from the 1700's until the advent of the twentieth century [Vlach, 1978, p.133]. What was different about this, however, was the spatial dimensioning and its transformations over time.

The hall-and-parlor house used the same basic form as the initial African model with the entry perpendicular to the interior passageway between the two rooms; however, the dimensions were much larger for each of the rooms. The basic dimensions found in northern Europe and in colonized New World areas average between 16' x 16' and 18' x 18', giving a much larger floor area. [Vlach, 1978, p.133]. It is possible that the colder climate coupled with increased interior storage needs and the human need for personal space when forced to remain in close proximity for longer periods, augmented this development. Additionally, different construction techniques were used such as hewn and mortise-and-tendon joints which increased the structural stability and allowed for greater uninterrupted spans. (Wattle and daub infill was known and used by both cultures). These techniques and spatial dimensions, brought as tradition to the New World, gave an architectural landscape of similar buildings whose use and spatial sensibilities differed.

Following is a series of diagramatic
representations of the transformations of the basic plan prototype and its attendant cultural implications for housing types found in the Caribbean. Bear in mind that these types of transformations are possible only when there is sufficient land, i.e., low density rural or urban settings, and that only one, the basic shotgun (three or four rooms) can, and has, made the transition into high density urban areas where the average plot has at least a 2:1 length to width ratio.

As a matter of cultural contributions to the transformations of the basic unit, it can be noted that the development of the shotgun house is generally attributed to African origin (Vlach, Berthelot and Guame, Chase) and is identified by the linear arrangement with the entry in the gable end. This is contrasted with the European based transformations which has the entry located along the long side of the dwelling which according to Berthelot and Guame, is the primary element that determines future transformations:

"...These features [jalousies, shipbuilder's carpentry, corner veranda/porch, etc.] were borrowed from the architecture of the colonialists. Their absence in Boni architecture confirms this origin...In some, the entrance is on the gable end, but for the most part, the entrance is on the long side (which is thus the main facade). This orientation is the one constant in popular rural architecture in Europe." [Berthelot and Gaume, 1982, p.20].

Also, bear in mind that these diagramatic representations show the transformations as additive when, in fact, some houses may have began as the basic unit then were subdivided. However, the intention is to present transformations in the modular construction methodology that began to appear in the early 17th century with increased production [Berthelot and Gaume, 1982, p.22]. Additionally, the module shown is approximately 9' x 9' and the openings in each wall may represent either windows (as in Puerto Rico) or doors (as in Guadelupe and Haiti).
Example of module
Example of basic unit
*increased outside activity area (work and social)
*undifferentiated interior access along front
*veranda modifies interior micro-climate
*veranda defines social transitional zone
*house oriented within landscape

*entire unit gains social focus
*total modification of micro-climate
*increased opportunity for infill
*requires increased initial building capital
*house becomes separate from natural environment

*increased interior activity space
*partial veranda maintains transitional zone
*possibility for enhanced (better defined) entry
*infill occurs primarily at rear reflecting increased public-private distancing
*increased initial number in household
*particular room use socially defined
*entry undifferentiated

*veranda defines social transition zone
*house oriented within landscape
*entry focused to street along long side

*increased outside activity
*modification of interior micro-climate
*increased opportunity for infill
*relationship to natural environment and infill pattern begins to follow A)
SAINT VINCENT
Découverte par Christophe Colomb 1498
Colonisation anglaise 1763
ANTIGUE
Découverte par Christophe Colomb 1493
Colonisation anglaise 1632
Indépendance 1981
GRENADDE
Découverte par Christophe Colomb 1498
Colombie espagnole
1502
Colombie française
1650
Indépendance
1763
Independence
1974
possibility for total privacy for at least one room

*increased number of household or possible additional activity (work, small shop, etc.)

*house oriented within landscape
*porch allows future infill
*porch becomes more 'private'/'claimed'
transitional zone

entry focused to street along short side
*house becomes more internally focused
*addition to rear of house increases public-private distance
*increased opportunities for individual privacy
*house begins to be zoned for specific uses and dimensions vary from basic module to reflect use
*house has basic linear orientation
*opportunity for individual privacy limited
*entire house essentially private

*house gains social orientation in landscape
*entry focused to street along short side

*variation:
*essential double shotgun plan
*shared veranda links two separate houses
*community dwelling focus augmented through shared veranda
variation:
*increased housing capacity
*opportunity for several smaller family groups with shared internal communal space
*opportunities for privacy defined by primary entry (user choice)
*privacy defined visually
THE SHOTGUN

A particular contribution to the Caribbean and later, North America, is what is commonly known as the shotgun house. It is distinguished by the lack of a hallway, the entry being from the gable end, and three or more adjoining rooms. This particular house is sited perpendicular to the street and usually has a small porch which runs the entire width of the front. This type of housing stock was fairly common among the poorer classes until the advent of modernization in much of the Caribbean and the U.S. south. The house is particularly well suited to hot humid climates and enhances communal rather than individual privacy. The genesis of this plan type comes from the forest zone of coastal West Africa with the particular room dimensions being a borrowing of structural norms developed in the region.

This housing became a prevalent form throughout the Caribbean during the early and mid-nineteenth century. Based on the early slave quarters, it grew in use as housing for free blacks, artesanos, and other segments
Haitian urban house, half timber construction. Note solid shutters, above door ventilation, aperture positioning, linear plan and gable entry.
of the population. [Vlach, 1978, p.124] (6). The dimensions and form gave a flexible inner space which required no special construction techniques or materials and it later became an inexpensive rental property.

Variations on this basic house began appearing around 1870-1880. More rooms were added, again keeping to the linear format, as former slaves moved from the plantations to the cities and the need grew for inexpensive housing that could simultaneously house larger family groups and fit the narrow, yet relatively deep, city lots. One such transformation was the double shotgun which consisted of two single shotguns that share a common wall. This limited the four-way ventilation properties of the initial plan although good ventilation remained by maintaining the same room configuration. Another transformation was called the camelback, which was a shotgun with a two-story section added to the rear.

Around 1880, the house became a standard city form and elaborate jigsaw-cut 'gingerbread' decoration was added. At this time the house also became referred to as a "...'Victorian cottage' and its alternative ethnic identity
Author's childhood home. The original structure was a garage which was subdivided with an addition of three small bedrooms in a linear pattern. The lack of a hallway shows a conscious choice based on traditional family building practices. Eleven people resided here.

became obscured." [Vlach, 1978, p.131]. It was then further modified to fit the requirements of the more dominant society by placing a hallway along one side to reflect a different sense of privacy by making the rooms individually accessible. Also at this time, the individual room size was enlarged to 12' x 12' and 12' x 14' with this transformation. [Author's observation].

This particular house type was a familiar form for this writer as many urban relatives and members of the black southern urban (and northern) population resided in these dwellings. The concept of a private bedroom was not possible and even the room closest to the street edge (commonly called the 'front room') was used for sleeping, thus functioning as a dual purpose space with either a sleep sofa and/or roll-away bed depending upon family size.

The kitchen, generally the last room in this linear arrangement, was the only room not used for sleeping. It functioned as the 'heart' (hearth) of the home. It was where most social activity occurred within the family and also where other kin (blood related or not) were invited to gather. The dual purpose
front room was only used for guests (those who would not be invited further into the house and, therefore, would not be allowed access to a greater understanding of the way the family actually lived.

The linear progression of the space augmented this social delineation for although the front room became a privacy area, the most private room (the kitchen) was actually the most social. The kitchen was where most of the kinship bonding rituals occurred such as food preparation/feeding/eating, emotional nurturing, grooming (hair cutting/pressing), sewing and clothes fitting, and sometimes laundry (especially in the colder seasons).

This progression of space from the most public to the most private architecturally augmented a culture. The parents or adolescent males usually slept in the front room (last to sleep/first to rise/traditional place of the house guardian) with the children in the next two rooms which were followed by the kitchen. The toilet, if there was one inside, was usually adjacent to the kitchen. The entire house reinforced familial interconnection and the concept of family was not defined solely by blood relationship but also by other bonding factors.

How far one was invited into the space spoke more loudly, and more clearly, than words. It was only when one was invited to 'call' directly at the kitchen door was a kinship status complete. This cultural behavior was clearly augmented and perpetuated by the residential architecture.

Public-private spatial diagram of a typical shotgun house.
House in Loiza Aldea, Puerto Rico.
SENORA PICA'S HOUSE

Another such house that demonstrates a transferral of African based dimensioning and plan is the home of Senora Pica in Loiza Aldea, Puerto Rico. As noted prior, Loiza is a coastal town that was settled almost entirely by persons of African descent. Much of the housing stock has changed since Munoz's 'Operation Bootstrap' in the 1950's, but there still exists numerous examples of the two and three room houses that were the dominant housing stock since the town's inception.

Senora Pica's house is over one hundred and twenty years old and is recalled as a typical house by Senora Pica's mother (who is around 100 years old as are several of the village elders). The house was built in its entirety and is of wood construction with a metal roof.

The house is essentially square in plan and consists of five zones: two bedroom zones; a common area; and two porches, one front and one rear. The house is sited on one of the town's main streets and is closer to the street edge than the others in the area which also indicates its age.
The house may be viewed as two, three-room houses connected by a larger, spatially differentiated zone. These three room sections approximate the spatial distinctions of the shotgun house. The two rows of bedrooms are identical in sizes and linear arrangement, therefore, the discussion of one is sufficient.

The rooms within the bedroom zone are connected in the same fashion as the Haitian caille except that there is no rear exit and reflect the basic 8' x 8' and 9' x 9' square dimension system. The openings are arranged to facilitate maximum cross ventilation as there is one opening in each wall except for the rear room. Also the window that opens to the front porch was once a door as the clapboards have been modified to reflect this change. The positioning of wall openings that differ from the location identified in the original module may be seen as a reflection of the fact that changes occurred as the use of standard furniture (beds, dressers, wardrobes) became more prevalent and the furniture dimensions then dictated aperture positioning. This basic building form can be seen to have been incorporated into this example of larger,
or compound, housing.

It is interesting to note at this point that when Puerto Ricans are asked how many rooms are in their house/apartment, the response comes in the identification of the number used as bedrooms. Speculatively, this may be a reflection of the fact that the earlier housing of this type was used almost entirely for sleeping with the rooms reflecting either male/female or adult/children division.

The larger common area reflects a spatial attitude that allows for two possibly distinct spaces to be considered as one larger space. It is a spatial dividing technique that incorporates low walls and posts to create two smaller zones that may be given two separate uses (living and dining rooms in Senora Pica's house) yet, are flexible enough to allow for one singular use. Obviously, Senora Pica's home was constructed to house a large number of people with a variety of interpersonal/familial connections although the house is currently occupied by only two persons at this time. A large space as this would be a very astute design decision reflecting a knowledge of living patterns and the primacy
Solid shutters on Senora Pica's home. These were changed to louvers on several of the windows during the 1950's.

of communal space so often seen in the black community. Jorge Rigau, President of the Colegio de Arquitectos in Puerto Rico (the island's counterpart to the A.I.A), stated that he was informed that "...this type of spatial division was of African origin although more complete research on the topic had yet to be done." [Rigau, 1986, Interview] This particular architectural zoning of one larger space became more elaborated, as did the general housing prototype, during the era of the Victorian style and its genesis remains unclear.

One remarkable aspect of this type of 'one as two' room type is that each area is essentially based on the square and the same 2:1 overall length to width ratio remains. Also, as seen in Senora Pica's house, there are doors to the outside aligned along the same axis with attendant side openings to facilitate good ventilation.

In general, Senora Pica's house presents an example of an attitude toward plan design that strongly focuses on the communal nature of a culture that, in the face of great adversity, was able to preserve and maintain its social values by incorporating them into the architecture.
SUMMARY

Overall, a sense of plan, spatial, and dimensional stability appears to have crossed the Atlantic with Africans who found themselves as slaves in the New World. As they were able to impact the physical environment through their housing, they left a tradition of house planning based on climate and traditional living patterns which was continued as a culturally based methodology. Even though slaves were brought from an architecturally diverse region of the African continent, there was a sense of shared cultural perceptions regarding housing for the common people. As Vlach states, partially quoting Edward T. Hall's "The Language of Space":

"...People take very strong cues from the space around them, space can crowd or overawe. It can irritate and it can be designed to serve a job, a personality, a state of mind." The cultural identity of a house thus lies deeply within it, changes of exterior materials and additions cannot dislodge the primary spatial statement." [Vlach, 1978, p.123].
Chapter IV: STRUCTURE

AFRICAN PRECEDE NTS

Structural systems in West African architectural technology of the period were based on two principles: weaving, the addition of pliable elements on a rigid frame (which includes lapping), and/or a type of masonry stacking. [Fraser, Hull, Oliver, et. al.]. Another system which was employed far less was a method of molding wet clay or puddled mud in a manner following pottery techniques. A wide variety of systems, pure and hybrid, were based on these concepts.

As iron was not used for common housing, weaving and/or lashing was an extensively employed system for constructing housing and also as the primary system on larger community buildings. The materials were those found in the rain forest environment: split bamboo, all parts of the palm, raffia, creepers, cleft wood, etc. Construction of a dwelling consisted of erecting a basic frame by implanting long sticks into the ground thereby making a rough type of loom and then interweaving the vegetable material around it. This gave a dwelling a basic structural integrity similar to a basket.
African system of diagonal bracing between first and second vertical members (above) and similar building attitude present in Senor Pica's house (right). On the above example also note raised foundation of packed earth and stone.
In order to increase this stability the interior walls were often plastered either with a dung/mud mixture or with kaolin, a hard drying clay. Some roofs were also made in this manner; however, due to the need to effectively shed water, roofs were more often constructed by a system of overlapping pre-woven palm fronds that were tied to a rigid structural member.

Another wall system that borrowed on this combined method of lapping and weaving used cleft planks, and other more rigid secondary members, that were tied together. Again a system of vertical poles would be erected and planks would then be attached either vertically or horizontally by a lashing system that gave tensile integrity to the structure. Lateral stability for this type of construction was achieved by placing diagonal members in the corners and lashing them between the first and second vertical members. As the method of inlaying, "letting in", diagonal supports into vertical wall members by forming an interlocking joint was not used, this technique for lateral stability was sufficient only for dwellings that were not subject to high wind loads and/or the pressure of supporting a heavy roof. For those that were, a combination system was employed that consisted of diagonal members, lapped horizontal planks, a more dense roof framing system that was securely attached to the walls, along with interior plastering for compressive strength.

Martinique house showing solid shutters and interior plaster over wood/weave frame.
The use of puddled mud or molded clay was a system used mostly in transitional dry zones that experience a period of seasonal rain. Large areas of topsoil were removed during the rainy period and allowed to become mud which was tamped by foot or with tools. This was then allowed to dry to a point of malleability and shaped into bricks which were then laid in courses. Roof supports were laid directly into the semi-set mud to enhance stability. The structure was then plastered to retard disintegration.

Other than the weave and/or lap method, the system most widely used was a stacking of stone or sun-dried brick and mortar combination. In this system roughly dressed stone or bricks, (which were a variety of shapes depending on the specific area) were embedded in a mud mortar and then plastered over on both sides. Entire rubble and/or rubble and dressed stone walls were made using this technique. Dry set stone also was used as facings over rubble cores and a method that used rubble reinforced with wooden planks and short cross pieces, or dressed stone imitating this technique, was an additional widely employed structural system (1).
From research materials, both the simple gable and the two sloped roof form were prevalent in West Africa. Buildings where the simple gable prevailed were usually store houses of some type or where the basic module was combined into a larger rectangular and/or courtyard form. This roofing system was used when the overall height of the building from floor to peak was not much greater than that of an adult male. This facilitated construction of the end walls and is seen in areas where there is not a notable problem with wind driven rain.

In areas where wind and rain are problematic, the two sloped roof predominates as the preferred form for square and rectangular dwellings. In these buildings, the four side walls are often higher than those of the simple gable and the roof is constructed at a more gentle slope than in the simple gable as it has a greater independent structural integrity. The slope of these roofs develop an overhang angle and length sufficient to protect the walls during rain storms while also allowing an outside work or sitting area of adequate width for use as a sheltered outside activity.
Boise Verna #15, Port-au-Prince, Haiti.

Benin palace, Nigeria. 15th century.
zone. The construction of the two sloped roof also allows for conservation of wall materials and facilitates construction by giving a more stable roof structure which may be climbed upon during the building process. This particular roof type also does not need a ridge pole that spans the entire length of the structure and employs fewer internal cross braces.

Obviously, this roof type is very common in areas of the world that have tropical climates and its genesis as an African system is not being purported. However, its continuation as a dominant roof system in the Caribbean slave and common housing stock until the 1950's is of note as it is a construction system that was previously known by Africans and that they (both the 'freed' black artesanos and slaves) did much of the construction of dwellings. It is both an appropriate climatic response and a structural system that was able to be maintained by a pre-existing tradition.

Typical housing in Cuba around 1900. Note hip roof, woven walls, and Yoruba plan type.
From research it has been found that the house is placed directly on the ground when made of mud or stone with no internal flooring other than tamped dirt smoothed by a cow dung hardening/polishing mixture [Hull, Prussin, Oliver, Walton, et. al.]. This is also found in some houses made in the woven or wattle and daub technique when the wall framework is of poles driven into the earth. However, as wood is an organic material that disintegrates when in periodic contact with moisture and the high humidity of the West African climate increases ventilation needs, houses were often elevated. The amount of elevation depended upon environmental conditions such as the amount of flooding experienced, height needed for adequate ventilation, and safety requirements. Types of elevation included wooden piles, stacked stone, and/or compressed earth platforms. These then became incorporated as tradition and were readily transferable into the Caribbean.
Several of the previously discussed construction techniques and formal responses can be found in the architecture of the Caribbean. At the beginning of the colonization and slavery period, the basic dwelling was based in the logic of exploitation and was linked to the development of the land. There were few, if any, large "manor" houses. The large or monumental architecture, located in the cities (trading centers), was based on European models for defensive architecture and/or other European public buildings. The majority of the population was to be found in the countryside, widely scattered. [Serge, 1981, p.80]. In this early 'pioneer' environment, the house of the owner was not notably different than those of the workers for, prior to the advent of large plantations, the slave owner was included in the primary physical labor force. These houses were based on the examples of the indigenous inhabitants and were modified in internal volume to reflect the specific cultural sensibilities (see Chapter III). In composition, these houses varied...
Early Cuba. Note plastering over woven frame, hip thatch roofs with overhang.

little from the empirically developed African examples for adaptation to local climate and wind was of great importance. Toward this combination of climate and tradition determinants, a basic house evolved that was oriented toward the sea, had a separation between private and communal spaces (or two rooms), and had the kitchen or hearth space separated from the house. Father DuTertre, contemporary with the early years of colonization, notes in Kaz Antiye that:

"The huts of the simple inhabitants are still only protected by reeds...; these dwellings on have "salles basess," or a ground floor, separated inside into two or three sections...The poorest dwellings are covered with cane, reed, latan palm or palm leaves...Since there is no winter in the islands, there is not a single fireplace in any of the houses...The kitchen is always separated from the hut. It is a little lean-to five or six steps down-wind." [Berthelot and Gaume, 1982, p.50].

One can see from this verbal description that the houses of both slave and slaver were similar to African precedents possibly due to the fact that they were, in actuality, the two primary cultures in the area and that African building is similar to that of the, by then decimated,
indigenous people.

The construction used was also similar, if not the same, as earlier African examples for the same materials were to be found in both locations. Satineau described it in this manner:

"Posts made out of very hard wood are planted three feet in the ground, four feet apart and six or seven feet high. The interstices are filled in with a trellis of slats in palm, or some other very hard and inflexible wood." [Berthelot and Gaume, 1982, p.51].

The huts of the two groups were not fundamentally different as they had the same materials and overall conception. It was only as the slave trade increased when sugar replaced tobacco as the dominant crop (around 1660) that the houses of the two groups diverged.

Notable changes occurred in the way of living at this time also. With the advent of allocating large spaces for crops, the settlement area became more constricted. The slaver's house became larger, based more on European models, and permanent while that of the slave remained essentially the same--mobile and small. Construction of slave dwellings became standardized, a standard based on and/or
consistent with African spatial models even though by that time the frames of such housing was often assembled by hired laborers with the slaves providing the secondary structure and infill. [Berthelot and Gaume, 1982, p.56]. These buildings were usually elevated 1'-3' from the ground on wooden piles or rocks as they needed to remain mobile in order to follow the crops as the land became depleted. These shelters had shutters that sealed shut, an African model which proved to be the only effective aperature protection against cyclones (slaves were not allowed into the plantations' hurrican shelters); roofs of cane tops, reeds or palm leaves; and walls that were woven or were of wattle and daub covered with a lime plaster. As Debien reflects on the early slave dwellings: "In the form and plan of the huts, there was more than one echo of Africa. Their silhouettes evoked the origins of their construction." [Berthelot and Gaume, 1982, p.55]. There are also accounts of slave housing made of "cut rock" in Santo-Domingo, Martinique, Guadeloupe and the Grenadines, all islands where stone predominates as a building material. Unfortunately, these accounts are without much

Caribbean sugar plantation around 1784. Note square plan of one room slave dwellings.
With the abolition of slavery this African model changed very little (2). The two-sloped roof, now a dominant form throughout the entire region became the standard construction for dwellings and even numerous public buildings. The use of wood shingles or metal roofing (depending on island) replaced the earlier palm versions. Also wood boards gradually replaced the initial wattle and daub or wickered wall even though the same type of diagonal bracing system remained for the structural frame (although now nailed rather than lashed). The houses remained elevated on either wooden piles or stone although today the use of concrete is rapidly replacing these materials even in the most remote regions. The use of materials once reserved for the ruling class may be seen in the light of assimilation attempts or as the enhancement of status. Nonetheless, the basic construction techniques followed the African precedents and did so until the 1950's when concrete became the primary building material.

During the 1950's, the common housing stock in the Caribbean changed to reflect the properties of concrete construction [field observation, Rigau, Berthelot and Gaume, et.al.] (3). Housing was no longer elevated to take advantage of the ventilation opportunities or, if it was, it often went an entire story rather than the customary 1'-3'. Also, the inception of a more developed infrastructure which facilitated better surface drainage, eliminated this minimal elevation as a necessary protection from flooding in urban developed areas. (This is not to say that the customary 1'-3' elevation no longer exists for it does, rather that the newer construction is often concrete block on slab which reflects a building methodology developed in cooler climates which has been transferred). The roofs of the newer concrete housing also generally have a shed, flat, or single gable roof, once again reflecting changed construction techniques.
Guadeloupe, 1980's.

Martinique, 1894.
Overall, however, the housing of the Caribbean currently still maintains the flavor of its earlier years. The two-sloped roof is still very much in evidence, even on some concrete structures and the once wooden piles have been replaced by concrete posts that now are often found at the height of an entire story which later often becomes a new 'first floor' via an infill process as the family's means increase. The African attitudinal precedents remain although, in keeping with the ability of language to distort/hide/obliterate, they are now described under the term of Creole architecture (4).
"Hat" roof types found in Haiti (left) and Benin (below). The Benin example is from 1965 (note wooden shingles) but expresses a general building attitude which has remained from an earlier era.
Chapter V: DECORATION

Bakuba funerary box embroidered with beads and cowries. Made in the shape of a Bakuba coffin which is also the form of the housing type.
AFRICAN PRECEDENTS

Prior to delineating the specifics of African contributions to the decorative aspects of Caribbean architecture, it may prove helpful to consider the attitude toward decorative elements in West African society. Decoration was not considered an addition to a building, rather it was considered to be an integral part of its construction; a house (or any other building) was not complete and functional until its decorative elements were finished.

African architectural decoration was used for territorial demarcation, common and/or private; as an indication of the structural soundness of a building; as a means of denoting a connection with a higher power, cosmology; and, as a means of denoting social status. [Adams, Denyer, Fraser, Prussin, et.al.]. Decoration was considered extremely important and as such it was often found as an integral part of the structure and/or applied (or incised) directly on the building. Also, it should be noted that both the actual decorative pattern and the color were important as these, in many ways, performed the same function as does the written word on buildings found in cultures that use an alphabet. Decoration was a highly developed, symbolic means of communication and many of the same patterns that were to be found on the architecture were also to be found in the clothing, pottery, music and dance (see Chapter III).

As architectural form and building methods serve to augment the development of a culture as well as to serve as a reflection of the values established by tradition, it would follow that the decoration of buildings further enhances the opportunities for the development/continuation of this tangible mode of communication. The use of decorative motifs to designate specific territory is a concrete transferal of symbols that allow a community member to function in the built environment with a minimum of social stress. Decorative elements in West Africa were used as demarcations of territory on two levels: public and private.
As an indication of collective territory, architectural decoration bearing the symbols of a specific tribe were used on the low walls that often marked the entrance to their claimed space. [Denyer, 1978, p.117]. This same type of demarcation was to be found on defensive structures such as city walls and other types of fortifications that developed around African villages as the slave trade intensified. [Denyer, 1978, p.117]. During this period of particularly intense intersocial stress, it appears to have become extremely important to codify, through symbol, the identification of a tribe. In this manner, it was possible for the stranger to identify his/her exact location within the human and built landscape for direct access to a specific people was not easily achieved (1). These patterns were often based on a particular tribe's cosmological belief system and in this way served a dual function; one of identifying tribal territory, and, another of psychic protection.
In a manner similar to the use of decoration as an intergroup communication, it also served to define private territory within a tribe. From the literature read it appears that the actual living patterns of West African tribes varied greatly; some organized into extended families who defined actual sectors of the village while others, who had a larger territory for habitation, were able to live in smaller relational groups with a greater physical separation between families. Still others divided villages by age groups with adults, married people, elders, and young women occupying one section while adolescent males occupied the other. [Denyer, 1978, p.19]. These are but a few of the examples of social organization found in pre-colonized West Africa. In all of these social systems it was important to define personal or family territory in order to keep social stress at a minimum and to define exactly whose territory one was entering. Architectural decoration served this purpose well for in placing the individualized motif upon a structure, it identified place and its exact location defined the degree of transition possible from that place.
Decoration also served to denote social status within a tribe. At times the status of a person(s) was defined by a special type of building (i.e., chief's house, elders, etc.) although in many instances, form and volume remained constant throughout a tribe and architectural decoration provided the only clues as to whether one was approaching the residence of the tribal healer or entering a women's compound.

As Susan Denyer notes in *African Traditional Architecture*: "...Clearly decoration is of considerable psychological significance, and it is interesting to note that it tended to occur at points of potential social stress." [Denyer, 1978, p.117].

With these aspects in mind, the use of decorative elements is of immense importance and very telling of the nature of a culture. Decorations were found at tribal territory entrances; homestead entrances; on granaries and grinding sheds; sacred, ceremonial, and community buildings; wives' rooms; doorways; inner walls; and roof pinnacles. The type of decoration also varied greatly and included relief mud/plaster, murals, the pressing of
natural objects into wet clay (pottery, mica, pebbles, cowrie shells, etc.), applied tiles, and sculpture.

Decorative elements were integral to the functioning of the building itself. [Prussin, 1973, p.4]. Often assigned great cosmological significance, and therefore reflecting this in the specific form/motif, these elements were considered responsible for communication to the user the actual state, condition, of the building. It needs to be noted at this point that buildings were often considered to be living entities and had more than a purely shelter relationship with the inhabitants.

These motifs and elements were found on structures as clay forms placed at specific points, as patterns woven into the walls, as designs incised into the building's plaster (foundations and walls), and as metal symbols placed at the roof peaks. Viewed structurally, it can be seen that these pieces of the architectural vocabulary are found in places of high stress. Clay pots or other elements can signal potential structural failure by cracking or becoming dislodged as can a torn or warped weave or cracking in an incised design.

Buildings were considered capable of speaking and the use of decorative elements helped them to do so. Whether this attitude developed from a shared mass consciousness/'map' or whether from an empirically tested methodology is not for this writer to speculate. What is clear is that decorative motifs were found in places of structural stress and assigned great significance for, at times, their location and condition was actually a life and death matter for the inhabitants.

Dogon menstrual hut with chameleon decorative elements. Form, decoration and placement within the village denote this as a special building.
Decorative motifs in West Africa generally adhere to two distinct categories, cellular and linear. [Denyer, 1978, p.122]. Those within the cellular category are usually composed of two alternating units, one 'positive' and one 'negative', such as one light and one dark or one raised and the other incised. A West African cellular design is based on geometric shapes and covers the entire surface on which it is found.

The second category, linear motifs, is based on curved lines which are often very intricate with much interlacing. This type of design is applied to a neutral ground and is mostly used to emphasize a specific area although it is also seen covering an entire surfaces (this seems closely related to social status and/or wealth).

The use of color was also of great importance. Tribes were identified by color combinations in addition to patterns and color often carried cosmological significance as well. The use of color was one element that could be easily transferred to the Caribbean. Generally, bold colors of deep hues and heavy saturation have been documented as the most prevalent ones used on West African architecture. [Denyer, 1978, p.118]. Also in addition to red, yellow and green, black, ochre and white were often used.

In general, architectural decorations in West Africa were a result of several factors: cosmological, structural, and social. Designs became standardized through generations, a process that was possible due to relatively little interference from outside forces until the advent of the slave trade. They expressed personal and community identity as well as signalled assertive/protective messages. Additionally, the decorations were more open to variation and change than architectural form and so more easily accommodated changes in social/cultural interaction, an aspect very important in their transferal to and transformation in the Caribbean.
Southern Nigeria, Ibo house. Mud walls inset with cowrie shells, carved wooden doors, and thatch roof.

Ganvie. Elevated house with cellular pattern in yellow, red, and green.

See Appendices for a more complete listing of African decorative motifs.

Southern Sudan. Lafofa granaries.
Cuba. Note non bearing wall pattern in lower left corner.
CARIBBEAN

Cellular Motifs

The most striking architectural decoration found in Puerto Rico was the use of cellular design motifs. This pattern of alternating light/dark, raised/incised, solid/void was a very strong theme throughout the island, especially along the coast in areas that were the locations of black settlement. Again this pattern was found in locations that defined territorial limits or transitional zones such as low walls that defined a private yard, retaining walls, and porch walls and floors. This pattern was also seen on the parapets of several commercial buildings and seemed to be a popular decoration for residential masonry foundations.

This particular type of cellular design was a checkerboard pattern of a type closely resembling that of the Dogon (Bandiagara Plateau, Mali), and other tribes that resided along the Niger River. These tribes followed a cosmology based on natural cycles and often used this type of decorative motif as a symbolic representation of such. The checkerboard pattern
uses an orthogonal square grid base and many examples of this found in the Caribbean use this grid. Also several of the examples use saturated contrasting colors to further highlight this design. In addition to the typical black and white, which was often noted on floors, red and white, and blue and yellow seemed to be favorites. Textually contrasting masonry, sometimes in addition to color was also seen, primarily on older dwellings. This used a rough faced or patterned block that was juxtaposed with a smooth faced one.

The cellular design is not limited merely to square grids but also was noted in patterns that were elongated along the horizontal axis. Sometimes this was accented by the addition of color or the particular manner of stacking the blocks themselves. This pattern was seen on non-bearing low walls that often acted as a type of fence around a yard and was a direct correlation to an earlier African pattern that used rectangular blocks. This pattern not only conserved the overall amount of material used to enclose an area but allowed for good ventilation while projecting an very strong solid/void image.
The use of a cellular grid cannot be said to be the result of African influence only. Much data exists to support its existence in early Asia (which also has a similar cosmologically based system of geomancy for the planning of cities and dwellings) and also its use in European design (2). However, the concept of dual development exists as a distinct possibility in relating its presence in Spanish dominated New World colonies. It may be seen as an element which was familiar to Africans, as it appears in Spanish colonial architecture (although usually based on the diagonal to orthogonal human movement [field observation]), and also as a symbolic communication representative of past ways of being which could be perpetuated without fear of reprisal. In this manner the 'language' was preserved even though it held dual meaning and, perhaps, because it did.

Puerto Rico. Cellular grids on commercial buildings. Top photograph shows a painted pattern. Lower shows two types; left, a ventilated parapet wall and, right, alternating raised blocks.
Animal Symbolism

The snake is a universal symbol which is given a variety of meanings. Among the Yoruba it represents the power of Oba and python cults are common and important from the Niger Delta to Benin. In pre-colonial Africa it was generally seen as a positive regenerative force, a view much different than it was assigned in Christian Spain (i.e., snake=evil=devil), and as such it is easily seen how this particularly powerful symbol would not be considered appropriate architectural decoration in New World slave societies. Other reptilian images, however, do not generally elicit such powerful reactions, one of which is the use of stylized lizards, chameleons, and geckos.

Stylized images of this creature were present in great abundance both in decorative ironwork and in cement block. The small lizard is a very prolific creature in Puerto Rico, as it is in most tropical climates. The Taino (indigenous people) used it as a symbolic pattern and it is a motif very much in evidence in West Africa. All examples of this particular motif were found on housing built within the last fifty years but its great abundance points

Ironwork with snake motif. This was the only example found of this type of animal symbolism. It was done by a slave blacksmith named Simmons in the mid-1800's.
Lizard motifs found in decorative ironwork and concrete block.

to a possibility of it being a traditional motif perpetuated by the artesanos that found new materials. (Either that or a result of periodic mass consciousness). However, its definite omission from the ironwork in Old San Juan, Ponce, and Mayaguez, and its popularity in largely black areas gave this writer reason to ponder the mysterious interrelatedness of architecture, symbolism, and culture.

So much is unknown about the cultural transformations of the island, especially regarding the attitude of racial assimilation over the centuries, that it is difficult to make any statement other than that reptilian decorative motifs are present both in Africa and in the Caribbean in areas of black settlement. Also, it is known that the Free Masons, a powerful part of the artesanos, were strongly anti-Catholic, that they built much of the ante-slavery/pre-industrialized Puerto Rico [Rigau, 1986, Interview], and that alternative religious practices existed throughout the entire Caribbean during and after slavery. [Mintz, 1974, p.74].
Color

It is difficult to present the use of color in the Caribbean in a document such as this and so it will be discussed minimally.

Color in Puerto Rico and throughout the Caribbean follows a general pattern of being very light and translucent in the town centers then becoming darker and more saturated as it moves outward. [Rigau, 1986, Interview]. This follows the general settlement patterns of the dominant groups and the subjugated.

Ponce, Puerto Rico. Parque las Bombas. This building is painted in red and black. The only example observed of this type of coloring on a public building. Approximately one mile away is a row of houses painted in the same manner.
The authors of Kaz Antiye attribute the decoration of the gable end of the house to African origin [Berthelot and Gaume, 1982, p.16]. They also attribute entries in that end to the same. This writer's African precedent research has not been able to verify that at this time other than in examples of ceremonial and storage buildings. However, due to the intense ceremonial/symbolic regard in which the entry is held in African society, it would follow that a gable end entry would be decoratively celebrated.

The gable is made from wood, a warm but light material in which it is easy to cut designs or to create patterns by layering in a manner that the bright sun's angle gives the intended effect by creating shadow lines. The actual decoration does not appear to be of primary importance as the motifs range from rigidly geometric to scroll work. The practice of decorating the gable end seems to have transformed through the ages from a celebration of the entry zone to a celebration of the gable for examples are readily identifiable where the entry is perpendicular to the gable and/or
where the gable is parallel to the street edge yet still is highly decorated. This may be a reflection of transmuted, though not translated, architectural language where a tradition remains that has lost its original symbolic meaning.
SUMMARY

Overall, the seemingly less 'important' architectural elements were able to be influenced by the contributions of African people in the Caribbean. The use of highly saturated colors for decoration; the use of cellular design motifs on walls, fences, foundations; the use of the small lizard motif; and, the celebration of the entry zone by intense decoration both in the materials and by color are usually considered secondary, and at times almost inconsequential, in housing although not in monumental or 'statement/image' works. Yet it is these same elements that give the dwelling its greatest identity within the built environment. The framework of slave dwellings at times were not built by them but were completed by weaving techniques and/or other African based building technologies in which decoration played an integral part. This kept alive ways to claim and identify territory through the use of remembered and transferred decorative practices. These practices have obviously transformed through the ages (including the remembered reasons for their use) but are still very much alive, possibly due to their being considered inconsequential by the dominant group. It, perhaps, is these very same architectural decorative elements that give so much of the sense of visual richness often associated with Caribbean architecture and societies.

Coastal area, Puerto Rico. Linear decorative motif in concrete porch wall.
Chapter VI: CONCLUSIONS

What was this all about anyway?.....
Village of escaped slaves.
CONCLUSIONS

1. People will always build what they know as representative of an affirming reality when they have the opportunity to do so. In a repressive socio-economic climate as that of the early Caribbean, the dominant module for housing was 9' x 9' which was also present in Africa. The fact that this module was present and used for the housing, allowed Africans a sense of familiarity in an otherwise alien environment and also a means to impact the built environment.

2. Africans contributed greatly to the residential architecture of the Caribbean in form, use of materials, decoration, and color which have been continued over time. However, documenting these contributions are difficult due to the length of chronological time between the beginning of the cultural confluence and today; the limited amount of early documentation which, perhaps, is a result of this type of early housing not being considered significant as it was not based on the conceptual map of the dominant group; the habit of reassigning elements which were/are of significance to the dominant group; and, the present day culture that exists in the region which, among the general populace, does not consciously celebrate the earlier African heritage.

3. The use of color and the types of color used are two very important African contributions which, unfortunately, due to the particular restrictions of this document are not possible to address in any meaningful way. The colors of the Caribbean and the prolific intentional decoration is the most visually arresting aspect of
African contributions. It is this visual celebration of the interconnectedness of humans and the earth which still prevails today.

4. Due to the very meaning of dual development, it is quite difficult to assign the use and proliferation of any universal symbols (such as cellular patterns and reptilian motifs) to any particular group. However, perhaps precisely due to the nature of dual development certain African patterns could continue, although with different symbolic meaning, until the present day.

5. This document, hopefully, shows how one may approach the documentation of contributions by a culture involved in an unequal dynamic and, in that respect, presents a methodology for research. The particular approach used here is based on the premise that the two groups had diverse cultural constructs/conceptual maps of the universe to allow comparison of how these views impacted an architecture. This may be of future use to those in the profession of architecture who desire to consciously and conscientiously design for groups who are of a different ilk. This is true not only for groups in other countries whose housing is rapidly becoming based on Western models, but also for the widely divergent populations in this country who reside in housing that neither affirms nor augments their growth and empowerment.
APPENDICES

House ruin, Loiza Aldea. Raised construction, solid shutters with vents above (side), cellular windows with openable panels. Part of the primary structure is visible where the wood siding has been removed. Estimated age, 130 years.
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CHAPTER I:

(1). The theme of religious education/conversion of 'heathens/pagans/etc.' has often been used as a means to morally justify the enslavement of a group. This is seen repeatedly when one examines the European Crusades, the Islamic Jihads and it was even an element present in the rationale of the U.S. Civil War. Religion augments social control without physical force as it relies upon the concept of an omnipotent higher power which reinforces the conceptual 'map' of the dominant group. Therefore, it has been seen repeatedly that if the priests of the invading group are not present during the initial take-over, they arrive very soon after. For example, Franciscan monks arrived in Puerto Rico in 1512, just two years after the first African slaves. [Tovar, 1973, p.45].

(2). For a more detailed discussion, see Mimmi p. 71 and Serge, p.101, and Maldonado-Denis' chapter on cultural assimilation.

(3). For a more complete discussion of this, see Chase, Mimmi, Mintz, and Vlach.
(4). One need only to examine the impact of the U.S. government supplied housing on Native Americans or the boxes supplied to South African 'homelands' (see Ross/Telkamp, p.26) or even the transformations of the kitchen in middle class residential architecture (see Hayden's The Grand Domestic Revolution) to see the impact on indigenous people and the lives of women.

(5). This type of stripping one of identity is exemplified by Mintz during an interview with Parmasad, a Trinidadian of Indian descent who states that "...the entire social system of Trinidad was geared to strip each Indian of "his name, his religion, his culture, his language, his history and become what the system demanded--that is, Christianized, Westernized, colonized, dehumanized." [Mintz, 1974, p.58].
CHAPTER II:

(1). Jan Morris in a review of the book, Caribbean Style, describes the architecture as a result of climate, materials and purpose:

"Then of course there is the Style of Purpose. There is no pretending that the functions of the Caribbean have generally been very inspiring. Except for the Caribs...the people of the islands went there in the first place in search of power and wealth, or because they were obliged to...Slaves, slave masters, money-makers and hedonists--such have been the shapers of Caribbean society, as of Caribbean forms." [Slesin, 1985, p.viii].

(2). Graziano Gasparini in "The Present Significance of the Architecture of the Past" in Latin America in its Architecture states that:

"Architecture has always reflected the supremacy and extent of power in its monumentality. The monumentality of the main square in Mexico City...produces the greatest sense of the presence and strength of power; however, in comparison to the European palaces of the seventeenth century it is clear that the capital of Mexico, besides being the seat of the power that rules, is at the same time the seat of power ruled by the European capital. The palaces in America were built to a human scale." [Serge, 1981, p.80].

Gasparini also notes that the opposite occurred in religious
architecture:

"On the other hand, religious architecture enjoyed special privileges; its buildings had to demonstrate the power won back by the Church, make visible the triumph of Catholicism over pre-Columbian idolatry, keep the work of evangelization and indoctrination alive in the indigenous population while, at the same time, it overwhelmed that population with the exuberant opulence of its gilded alterpieces." [Serge, 1981, p.81].

It can be seen that both the municipal buildings and churches, while perhaps not being of the same scale as their European counterparts, were certainly volumetrically overwhelming when compared to the very modest scale of slave housing.

(3). Maroon societies, the buildings of the Surinam, Boni, and other escaped slaves represent the most pure examples of African building in the Caribbean. They are not included in this document as their buildings were not a part of the confluence of two cultures. However, they are referred to in Kaz Antiye as a basis for comparison and are used as such.

(4). The hut or small house is considered a part of the landscape, the natural environment. This is due to it being linked primarily to a society which evolved based on mining and agricultural production for a far-distant
entity. Also it was made from readily available materials whereas (as the slave trade increased) the houses of the slavers began to be constructed of imported materials. This architecturally symbolic distancing firmly embedded the view that the hut was linked to the earth and to production and that those who inhabited these dwellings were a part of this production also.

(5). For a more complete discussion see Baralt, Mintz, Nazario, and Tovar.
CHAPTER III:

(1). Rapoport expands on these conceptual constructs to include a third which is a sort of 'middle ground' wherein he describes it as "...Symbiotic. Here man and nature are in a state of balance, and man regards himself as responsible to God for nature and the earth as a steward and custodian of nature." [Rapoport, 1969, p.75]. His intermediary construct corresponds with, and by inference, is included in the author's first model as both assume that no human can control nature but only modify the effects of it by human response.

(2). For a more complete discussion see Adams, Denyer, Fraser, Moughtin, Prussin, and Rapoport.

(3). David Kithyake, an architect and visitor to MIT from Kenya who works in Central and West Africa, explained that in African society the territory around the house is not considered as being separate from it but, rather, a part of the overall living area. He stated that "...the first thing a woman does in the morning is to sweep the entire area that surrounds the house for it is considered a part of the home..." [Kithyake, April, 1986, Interview]. Also, this attitude that the house is a part of the environment can be seen in Chapter II as a part of the 'Caribbean
Garden.' This may be a transferal of an attitude from Africa to the Caribbean which remained and was able to influence the resultant architecture as Berthelot and Gaume state that "...The hut and its annexed spaces form a whole." [Berthelot and Gaume, 1982, p.66].

(4). The climate of the area may be a major factor in this development. Also, the exchange of information and goods through the trans-African trade routes of the 11th-13th centuries may have augmented this development as they were the mass communication lines of the era. Sources for further reading on this matter are Murdock's Africa as well as Davidson's A History of West Africa.

(5). There exists a fairly massive body of information on issues surrounding and concepts regarding the meaning of privacy. For beginning reading as this relates to architecture see Rapoport beginning on p.67 as well as Sandra Howell's Private Space.

Chapter IV:

(1). The basic 9' x 9' ± 1'-2' module can be seen to have been derived from either of these two basic structural systems. In the rain forest zone, the materials used were capable of supporting relatively light dead and live loads. Being very flexible, these materials had more tensile than compressive strength and being organic vegetable matter, this tensile strength was extendable only for relatively short distances. To increase the usable length in the compressive range, increased diameters would be necessary. Given that most of the housing was erected in a very short time, larger members (hence increased spans) would have increased the time necessary and also would have necessitated different joinery techniques.

Stacked brick and stone also had the same effect although for different reasons. These materials have greater compressive strength (making vertical unit stacking possible); however, in the areas where brick and stone predominate, there is less wood present for use as the secondary structural system (roof supports, etc.). Tribes such as the Hausa reused these wooden parts which seem to have a critical bending moment length of approximately 9'. Over the centuries, these factors may have become incorporated into the region's cosmology via empirically developed methods. For further information see Moughtin's
Hausa Architecture and Prussin's The Architecture of Djenne.

(2). Berthelot and Gaume describe this lack of architectural change in this manner:

"In fact, the hut itself didn't change or changed only very little; contemporary descriptions and photographs attest to this. It was the two room hut of wattle and dried mud, covered with cane leaves, that survived through the 19th century. What we witness is simply a progressive, if slow, use of wood boards to replace the wickering. Perhaps this can be interpreted as an external manifestation of a rise in social status." [Berthelot and Gaume, 1982, p.60].

(3). It is interesting to note that even though concrete became the prevalent building material at this time its use has been more adaptive than transformative: "...concrete reinforcement is built around the central wooden core...Where there are wood posts concrete posts are added on to them...The concrete form is thus derived from the original frame of the hut (3 x 3 meters)." [Berthelot and Gaume, 1982, p.124]. This is also true from the author's observation of building practices in coastal areas and especially in the highlands around Humacao, Puerto Rico.

(4). This term, Creole, was used by numerous persons to describe the architecture of the region. It is also a
linguistic derivative formed by the interaction of two or more distinct languages. These two, architecture and language, are closely connected and the conception of creole forms an intermediary element for interaction. For example, the authors of Kaz Antiye note that "...even though the creole term 'kaz' signifies 'lodging hut', its more specific meaning is 'the Negro hut'. The Frenchified term 'mezon' is preferred for designating the master's house, or even the modern, Western-seeming cement house." [Berthelot and Gaume, 1982, p.10]. The creole language developed in a colonial/enslavement context as did the region's architecture and both represent a dynamic that at once clarifies connections but also obscures the contributions of the less dominant group for the language and the architecture became based on the lexis and syntax of the dominant power. Berthelot and Gaume continue:

"Historically, there were always two elements in a relationship of constant struggle. One, African, is numerically superior, but dominated ideologically; the other, European, is numerically inferior but ideologically dominant. A third element was born of their contacts and their struggle. With the stabilization of this third element, cultural entities, such as the hut and creole, were produced." [Berthelot and Gaume, 1982, p.10].

With the above statement, they are not yet finished commenting on the collision for they continue:

"Beyond obvious aberrations, these 'bastard'
creations...vestiges of a long-past colonial period, are nonetheless imprinted in the private self of a whole people. To enter into Creole and into the hut...is to enter into the private space of the Guadeloupean, who experiences them not as rigid and outdated, but as living. The history of this people shows how, within a dialectic of oppression and resistance, they have been able to take structures that were initially oppressive, and transform them into expressions of resistance. Creole, at first a product of the separation of the African from his culture, is also the slave's own creation. The hut...is similarly reappropriated." [Berthelot and Gaume, 1982, p.11].
CHAPTER V:

(1). Denyer devotes an entire chapter to defense which begins on p.67. Also, Vlach discusses the transference of this type of building knowledge through relating an account by Col. Barnwell of how a runaway slave taught Native Americans to fortify their encampment: "...the Indian camp had been surrounded with impressive trenches and earthworks as well as a palisade of reeds and canes, defenses that recall the fortified villages of the Vai of Liberia. These military structures were not part of the Tuscarora building tradition..." [Vlach, 1978, p.136]. Unfortunately, it is not known whether any symbols were used on this, although, based on other cultural similarities between Native Americans and Africans (such as a shared belief in the earth as a cosmologically generative force), it would seem to be so.

(2). It may be interesting for a future researcher to compare the dissemination of both cellular and linear motifs throughout Europe and Africa. The concept of dual development withstanding, it can be postulated that the decorative motifs found in West Africa and in Spain may be more closely related than at first glance for both areas were a part of the extensive Islamic trade routes of the 11th-13th centuries which dominated Africa, the Mediterranean
and southern Europe. Also, from approximately 700 A.D. until at least the middle of the 14th century, the Iberian Peninsula was architecturally dominated by Islamic concepts. This continuation of Islamically derived decorative motif was very much present in Old San Juan, Mayaguez, and Ponce, Puerto Rico which may also be viewed in the light of one of this thesis' primary questions: What may have been present in the physical landscape, built and natural, that gave Africans brought to the New World any sense of familiarity of place in an otherwise alien environment? For further information on this aspect see Monteguin's *Compendium of Hispan-Islamic Art and Architecture.*
Rainfall map of Africa

- Above 80" per annum
- Above 40"
- Above 12"
- Less than 12" untinted
Map of West African Tribes related to Political Boundaries

Countries of West Africa
1. Senegal
2. Gambia
3. Portuguese Guinea
4. Guinea
5. Sierra Leone
6. Liberia
7. Ivory Coast
8. Ghana
9. Togoland
10. Dahomey
11. Upper Volta
12. Nigeria
13. Niger
14. Mali
The following maps and table are from *The Atlantic Slave Trade* by Philip D. Curtin. They are included here to give the reader a sense of the magnitude of the slave trade, regions where the Africans resided, and where they eventually relocated.

### Relation of Slave Imports to Population of African Descent, c.1950 (000 Omitted)

<table>
<thead>
<tr>
<th>Region and country</th>
<th>Estimated slave imports</th>
<th>Estimated population partly or entirely of African descent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>United States &amp; Canada</td>
<td>427</td>
<td>4.5</td>
</tr>
<tr>
<td>Middle America</td>
<td>224</td>
<td>2.4</td>
</tr>
<tr>
<td>Mexico</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Central America</td>
<td>222</td>
<td>0.5</td>
</tr>
<tr>
<td>Caribbean Islands</td>
<td>4,040</td>
<td>43.0</td>
</tr>
<tr>
<td>South America</td>
<td>4,700</td>
<td>60.0</td>
</tr>
<tr>
<td>Surinam &amp; Guyana</td>
<td>286</td>
<td>0.6</td>
</tr>
<tr>
<td>French Guiana</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>17,529</td>
<td>36.6</td>
</tr>
<tr>
<td>Argentina, Uruguay, Paraguay, &amp; Bolivia</td>
<td>97</td>
<td>0.2</td>
</tr>
<tr>
<td>Chile</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>110</td>
<td>0.2</td>
</tr>
<tr>
<td>Colombia, Panama, &amp; Ecuador</td>
<td>3,437</td>
<td>7.2</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1,620</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>9,391</td>
<td>100.0*</td>
</tr>
</tbody>
</table>

*Percentages have been rounded.  
† Less than 0.05%.

This table derived by Curtin shows that over 4 million Africans (43% of the total imported) were brought into the Caribbean Islands during the slave trade and that by the census of 1950, 9.5 million (20% of the total claimed to be of African descent.
Major trends of the Atlantic slave trade in annual average number of slaves imported.
Slave imports during the whole period of the Atlantic slave trade by region. Circle size is reflective of area of distribution.
Origins of slaves in Jamaica, Saint Dominique, and the United States as a part of the 18th century English slave trade.
Destinations of the Atlantic slave trade, 1451-1600.
Destinations of the Atlantic slave trade, 1601-1700.
The slave trade of the Royal African Company (English), 1673-1689.
Destinations in the slave trade, 1701-1810.
Destinations in the slave trade, 1811-1870.
Ethnic origins of captives in Sierra Leone in 1848. The names in quotation marks are census categories with no modern equivalent.
A TAXONOMY OF HOUSE FORMS

The following information is derived from Susan Denyer's *Traditional African Architecture*. This proved helpful in comparing plans and other architectural elements from Africa with those present in the Caribbean. The following information is not inclusive of all African house forms but only those that were of use to the author. For a more complete listing, please refer to the above book beginning on p.133.

1. Round plan, free-standing; flat roof; walls of mud or mud and straw; found in tight clusters, usually built into surrounding wall; painted and incised decoration on walls common. Examples: some Dogon (Mali); Lobi, Nankanse, northern Ghana; southern Upper Volta; northern Upper Volta.

2. Oval plan, free-standing; mud and/or wattle walls; thatched saddle-back roof with semi-conical ends; sometimes on stilts. Examples: pockets of coastal areas and lake shores of southern Liberia, Guinea Bissau, Senegal, Tanzania; central Ivory Coast.
3. Square plan, free-standing; conical roof; walls of mud or mud and palm fronds; thatched roof of grass or reeds. Examples: Bamileke, Bamoun (Cameroon); Abadja Ibo (Nigeria).

4. Rectangular plan, sometimes free-standing, thatched saddleback or lean-to roof; walls of planks, bamboo, cane, matting or cane and matting; walls sometimes plastered internally; roof thatch of palm leaf mats, reeds, bark, palm fronds, sometimes on stilts. Examples: widespread in Zaire River Basin; Nigeria; forest areas of southern Cameroon.

5. Rectangular plan, free-standing; thatched saddleback roof; buildings often arranged facing across a small court with some of the sides facing court open or pillared; walls puddled mud or wattle framework plastered over; relief murals common form of decoration. Examples: Ibo, some rural Hausa (Nigeria); Ashanti (Ghana); southern Togo; southern Benin; southern Ivory Coast.
6. Rectangular plan; thatched saddleback roof; units built around court or impluvium having continuous roof; walls of puddled mud or mud and wattle. Examples: Bini, Yoruba, Eko (Nigeria).

7. Rectangular plan units; one storey high but built coalescing and on top of one another; mud brick or puddled mud walls; flat mud roof reinforced with wood and palm fronds. Examples: northern Ivory Coast, Mali, Upper Volta, Northern Ghana.

8. Square plan; free standing; walls of poles or palm fronds and mud; hipped roof thatched with grass or reeds. Examples: Lozi (Zambia); Pende (Zaire); Tikar (Cameroon).
9. Square plan; free standing; thatched hipped roof framework of flexible poles embedded in bround at base and tied at apex under tension; slightly convex profile; thatch of grass; often with elaborately carved door frames. Examples: Holo, Suku (Zaire, Angola).

10. Rectangular plan, free standing; hipped roof; thatch of palm leaf mats sometimes with two long sides lapped over other two; walls of wattle and mud; sometimes with carved wooden door posts sometimes on stilts. Examples: coastal regions of Kenya, Tanzania, Nigeria, Benin Rep.; lake shores and central Zaire.
AFRICAN DECORATIVE MOTIFS

Following are representative samples of cellular, linear and animal decorative motifs which were used for comparison in preparing this document.
Although materials and building systems have changed over the centuries, it appears that due to tradition and climatic stability many of the following were in use during the slavery period and are still in use today.

Woven cleft wood, split bamboos, palms, raffias, creepers, etc. Often plastered over on inside.
Wood, bamboo fronds, grass bullmores, tied to framework, of wood bamboo or palm reeds. Stones sometimes used as infill. Sometimes plastered over on inside or on both sides.
Cleft planks, arranged vertically or horizontally between upright poles. Horizontal planks sometimes lapped.

Puddled mud laid in courses. Roof supports sometimes embedded in walls.

Roughly dressed stones or sundried bricks, either rectangular or pear shaped, embedded in mud mortar. Often plastered over on both sides.
Dressed stone blocks, dry set, used as facing over rubble core or for whole wall.

Rubble wall set with mortar plastered over on both sides. Openings and corners edged with dressed stone.

Stone rubble walls reinforced with wooden planks held in place by short wooden cross pieces. Solid rock walls sometimes dressed to imitate this technique.
Thatched roofs over rectangular plans:

Tied or woven split palms, bamboos, cleft wood or bundles of grass or reeds. Whole framework embedded in ground at perimeter or supported on forked uprights or load bearing walls. Thatched with reeds, grass, palm leaves, banana leaves, marantaceous leaves. Sometimes double thatched or covered with skins or mats.
SPANISH ELEMENTS (A SAMPLE)

The following plan, door types, and other architectural elements were obtained from the Collegio de Arquitectos de Puerto Rico. This information is a part of their ongoing cataloging project of the island's architecture and is primarily urban housing of significance in Puerto Rico's history. This information proved helpful in comparing Spanish and African contributions as it provided contextual information regarding general living attitudes as well as specific architectural information.
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p.33 Author
p.34 Buisseret
p.37 Tourism Company of Puerto Rico
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