ON METHOD

ANALYZING AERIAL PHOTOGRAPHS OF TRADITIONAL MAROON SETTLEMENTS

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Compared to cartographic maps used by geographers or site-planning schemes produced by architects, aerial photographs seem to provide an appropriate tool for the analysis of traditional settlements. This tool was found to be very effective in studying the Maroon settlements of French Guiana, as this paper demonstrates. The resulting comparative examination of the traditional rain forest villages and the semi-traditional suburban migrant settlements revealed commonalities which identify a unique "Maroon" pattern. This pattern contains a mixture of semi-circular and linear arrangements of dwelling units combined with a reticulated structure of paths and open spaces. But while the traditional village appeared in a secondary forest in various stages of agricultural exploitation, the suburban settlement contained some element of artificial patterning like the large houses and the French-imposed circulation grids. Like all techniques used in field research, aerial photo interpretation can only be significant if it is coupled with other culturally-based approaches.

Techniques of architectural representation based on the documentation of pertinent structural and morphological details have long been adopted by anthropologists for the description of traditional constructions. These descriptions are generally developed through first-hand surveys in the field. The organizational patterns of communities, ethnic enclaves, villages, and entire cities have also been documented by methods borrowed from the techniques of morphological urban analysis. But in order to establish the analytical layout which is at the base of such a study, it is essential to go beyond mere on-site observations. Topographical maps and

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village cadastres representing the form of the site as well as public and private constructions should also be consulted, for it is often from these pre-existing sources of information that more specific hypotheses can be generated.

Unfortunately, anthropological analyses of traditional communities often deal with sites which have never been the object of systematic or even partial morphological representation. In such cases it is sometimes possible for researchers to create their own documentation of a delimited zone or site. Another possibility is the utilization and analysis of pre-existing aerial photographs of various scales, or when feasible, the creation of a series of such photographs. In practice, the utilization of cartographical sources and aerial data in the study of the structure of traditional settlements are complementary but not equivalent techniques. Cartographical documentation yields precise topographical information, whereas aerial photographs provide more specific morphological details.

This experiment in photo-interpretation, conducted using a group of traditional Maroon villages in French Guiana, has demonstrated that it is possible to establish a valid morphological model illustrative of the spatial organization of the villages themselves. It should nevertheless be emphasized that such "laboratory" techniques are inherently limited, and only take on their full significance when confronted with the information and insights generated by more classical methods of ethnological investigation.

This study is part of a larger program of research dealing with the development and transformation of Maroon settlements in French Guiana. In the course of a previous research principally concerning migrants' villages in the same territory, we were struck by what appeared to be a discernable logic in the structure and internal organization of the make-shift habitations of the spontaneous peri-urban communities. At that time, however, we were unable to initiate a systematic analysis of these settlements due to the lack of relevant morphological documentation.

As an aerial photographic survey of Maroon villages was made in French Guiana in 1984, we could later investigate this initial hypothesis concerning the existence of a traditional pattern of structuring of Maroon villages, partially maintained in the present-day migrants' communities. Only the traditional forms of Maroon villages will be treated in the present report along with the corresponding information furnished by aerial photographs, and only a passing mention will be made of the relative permanence of such traditional structuring in the most recently formed communities.

THE DEVELOPMENT OF TRADITIONAL SPACE

The Maroon populations of present-day Surinam and French Guiana are the descendants of African slaves who escaped from Dutch plantations established along the coastal regions in the seventeenth and eighteenth centuries. Fleeing the plantations, individuals and small groups eventually found refuge within the forest of the Guianese plateau, and from 1684 to 1773 diverse groups such as the Sara­maka, Djuka, Paramaka, Matawai, and Aluku (or Boni) constituted independent tribal communities. The Boni found themselves in open conflict with the other tribes in Dutch Guiana, and were obliged to take possession of the territories bordering the upper reaches of the Maroni (Lawa) River in French Guiana (FIG. 1).

The expression "traditional civilization" seems rather inappropriate to describe the cultural originality of the Maroon communities. The members belonged to a variety of African ethnic groups, but since they did not reproduce the cultural characteristics of these groups to any marked degree, it would be preferable to consider their communities original social creations. They were founded on a heterogeneous African heritage, more or less influenced by a prolonged exposure to colonial institutions during the period of plantation slavery.

The specific cultural identity of the Maroon communities could not have prevailed and developed had it not been for the favorable environmental conditions in Guiana. The dense rain forest offered an ideal haven against punitive raids by the colonial authorities. It also enabled the population to exploit the natural resources and ensure their survival. The habitat and residential system adopted by Maroons would thus appear to be decisive factors...
in their social history. The communities were able to maintain a stable ecological and social structure by associating the activities of fishing, hunting, fruit-gathering, and shifting agriculture on burnt lands. This organizational model, described by Hurault in his study of the Boni communities of French Guiana, also seems applicable to the Maroon settlements in Surinam.4

The Boni communities of the Lawa river region in French Guiana were constituted by tribal clansmen and women of the same lineage, for the tribe was and still is subdivided into matrilineal clans. Each matrilineal clan possessed exclusive rights over a portion of the tribal territory. Each portion corresponded to a "large" village (kondre), inhabited in theory by members of the same matrilineal clan (bee). In reality, the unequal demographic development of the diverse clans, as well as the relative mobility of the Maroon population even before the perturbations of recent migratory movements, created a diversity in the resident population by the presence of inhabitants belonging to other matrilineal clans. The inhabitants of a given village, whatever its composition, are designated by the vocable lo. Members of the Maroon communities also periodically reside in agricultural camps often situated relatively long distances from their village of origin, where they construct temporary habitations known as kampu.

Nevertheless, the lineal village of origin, with its shrines consecrated to the matrilineal ancestors (fraga tiki) constitutes one of the most important elements in the Maroon social structure even for the migrant workers separated for years from their village of origin. It is their membership in the specific matrilineal clan associated to a specific village which determines their relationships with other members of Maroon society.

RECENT MIGRATORY PATTERNS

Since the 1960s the Maroon population of Surinam and French Guiana has increasingly abandoned their villages in the interior for the coastal region from Paramaribo to Cayenne. The cessation of gold mining activities (which had created an equilibrium between the subsistence economy of the population and the exchange economies of Western society), the appearance of outboard motors and the establishment of interior air transport facilitating the communication between the forest communities and the coastal cities, and the demand for workers for the huge construction projects such as the new town of Kourou have all contributed to an apparently irreversible migratory movement away from the traditional villages.

The migrations not only engendered new settlements that are generally composed of hastily-constructed, makeshift habitations, but they also provoked the destructuralization of the traditional villages of origin. Nevertheless, the migration to the coastal regions is not the sole contributing factor in the transformation of the traditional villages. French governmental agencies have for many years
imposed cultural and social models foreign to the Maroon population.

**Maroon Villages and Planned Developments**

In 1946 French Guiana abandoned its former colonial system of administration for the statute of "French Overseas District." For decades the ancestral territories of the Amerindians and the Boni had been accorded a special status due to the "Tribal Policy" of colonial administration. In the lands delimited by the "Inini Perimeter" the indigenous population was accorded the right to observe their traditional customs, and the inhabitants were not subjected to the national system of law and jurisprudence.

The status of exception was abolished in 1969, but even before that year numerous actions based on a program of assistance and assimilation had been undertaken. The series of interventions and regulations concerning the Boni villages, along with the creation and modernization of public services, constituted an ever-increasing influence by the dominant culture upon the social structures of the Maroon population. There also appeared a number of planned housing developments designed and laid out by the Territorial Administration, and even entirely new villages such as Pompidouville on the Lawa River, constructed after the former village of Papaiston had been destroyed by floods.

But the modernization of the Boni tribal lands is not only due to the actions of the territorial authorities. The Maroon populations themselves are also attracted to nontraditional styles of life, and those who now live in the coastal villages often construct habitations based on the Creole model.

The traditional Maroon village appears according to Price as "an irregular arrangement of small habitations." For Hurault, "the inhabitants construct their dwellings wherever they wish, since there is no tradition or custom which imposes any sort of pattern." Statements of this nature can be said to reflect a certain cultural bias, although it is certainly true that a traditional Maroon village situated on the Lawa of Tapanahoni does not generally correspond to any of the aesthetic or architectural categories immediately familiar to a European observer. It is only through systematic analysis of the morphological organization of these settlements that some patterning effects can progressively reveal a specific structure of Maroon habitat.

The aerial photographs which were taken in 1984 enabled us to study five culturally and geographically homogeneous villages situated in the most ancient of the Boni territories on the Lawa River, those extending from the Cottica Rapids (Abattis Cottica) to the confluence of the Inini.

**Interpretation Protocol of Aerial Photographs**

For each of the sites studied we obtained stereoscopic aerial views of 1:8,000 scale, which were enlarged into 1:2,000 scale nonstereoscopic views for the constructed areas. The three-dimensional effect of the stereoscopic photographs produced sharp discrimination when applied to differences in vegetation, soil use and condition, and siting of constructions. The series of images in 1:2,000 scale permitted the measurement of precise distances in constructed zones and the identification of roofing materials. The photos were later used to draw analytical layouts of the settlements studied.

The test sites, Loca and Cormontibo, were chosen for aerial observation independently by a geographer specialized in photo-interpretation and myself. The empirical categories that resulted were in both cases identical, and the following zone system was established: 1) dense rain forest; 2) stratified and open forest; 3) dense and high second-growth forest; 4) regenerated undergrowth with tall shrubs and thriving palm trees; 5) dense, low, second-growth vegetation with young palm trees; 6) dense, low, second-growth vegetation without trees; 7) open zones with clearing operations; 8) light, low vegetative covering; 9) slight traces of vegetation; 10) bare soil.

The physical details of the constructions revealed in aerial photographs were relatively limited but were exploited thoroughly according to the following system of classification: a) dimensions of the constructions; b) distance of constructions from topographical reference points; c) distance between con-
structions; d) roof orientation; e) degree of roof slope; f) roofing materials; g) orientation of principal facade (based on visible signs of utilization).

The following categories permitted the creation of a morphological evaluation of the form of the settlement: A) perimeter of village, form and aspect; B) access system; C) path system; D) continuity or discontinuity of constructed areas; E) variations of density by sector.

By applying the above three systems of analysis and classification to the sites studied, we established a series of descriptive notes along with plans and schematic diagrams. I shall now demonstrate how these were applied to an actual site, the village of Loca.

**MORPHOLOGICAL DESCRIPTION OF LOCA**

Using the above-mentioned analytical system, we generated four themes concerning the environment, the organization of village space, its subdivision into compounds and quarters, and the typology of the constructions.

The village of Loca is situated in a forest clearing on the banks of the Lawa River. The village of Agode is located some 700 meters to the north on the same side of the river, and the village of Assissi is constructed on an island 600 meters to the south. Because of the proximity of the three villages, the total land surface appearing on the series of ten aerial photos covers an area 4.8 kilometers long by roughly 2.8 kilometers wide.

The opposite side of the Lawa River constitutes one of the borders or Surinam, and is covered by dense rain forest (zone 1), as are the series of heavily forested islands situated in the river itself. Conversely, the French Guianese side of the Lawa is characterized by extensive patterns of deforestation behind the villages bordering the river (FIG. 2).

The size of the deforested zone is approximately 4 kilometers long by 1.3 kilometers wide. The zone runs parallel to the river but is separated from the river bank by a band of compact undergrowth (zone 2) approximately 200 to 300 meters wide except to the south of Agode.

The deforested zone is marked by a characteristic pattern of aureoles formed by multi-lobed clearings. The basic unit of deforestation is a circular clearing 100 to 200 meters in diameter, which sometimes can be isolated. But, generally, adjacent clearings are opened simultaneously, and the connection of two, three, or even four, five, or six of these circular clearings creates resultant forms of bi-lobed, tri-lobed, or multi-lobed areas visible on aerial photographs. The largest aureolar clearing is 600 meters in diameter (FIG. 3).

Certain of the plots are undergoing agricultural exploitation, other ones display uniform levels of second-growth forest, and others appear to be in diverse stages of reforestation. Some different patterns of cleared areas are visible also, such as oval or crescent-shaped plots of 20 by 40 to 160 meters.

FIGURE 2. Loca — The environment.
views of forest clearings can be perceived axonometrically and traces of paths appear, but these don’t constitute a complete network, being limited to short segments. Beyond the cleared zones there extends a dense area of rain forest (zone 1), unbroken to the northeast and manifesting signs of isolated agricultural exploitation to the southeast.

For each village the lineage territory delimited by tribal law is much larger than the framing of aerial photographs. But the visible portion which could be studied appears to be a characteristic and homogeneous part of the global environment, illustrating the structure linked to the agricultural activity of any Maroon settlement. Even the distant plots of lands which are cultivated out of the limits of tribal territories and far away from any village produce the same typical aureolar patterning.

A principal characteristic of the village of Loca is its intimate relation to the river. The portion of the village bordering the river front is punctuated by three landing sites, visible from the air as clearings along the river bank with a network of well traced access paths and the presence of beached pirogues. The landing sites are of unequal size and would also appear to be of unequal importance.

The principal site is large and well delimited, with a system of interconnecting paths leading to a dense group of habitations some 30 meters directly behind. A second, smaller landing site is found 100 meters to the south, serving a less dense but equal-

It seems that the oval clearings are opened at the junction of two circular regenerated agricultural plots and that the crescent-shaped forms are located at the exterior perimeter of a circular regenerated area.

The circular and modular pattern of cleared agricultural plots is extremely visible in the aerial photographs. The effect of stereoscopic relief also permits the reconstitution of the volumetric variations in vegetation levels as well as the diverse stages of second-growth forest (FIG. 4). Frontal

FIGURE 3. Forms of agricultural clearings.

FIGURE 4. Form of the clearing front.

FIGURE 5. Loca -- river landing sites.
ly numerous group of habitations. At the northern extremity of Loca a much smaller landing site is prolonged by a narrow path leading to a group of five houses separated from the main body of the village by barriers of vegetation (FIG. 5).

The edge of the river bank between the three landing sites is steep, inaccessible, and heavily overgrown with forest vegetation. The total length of the village waterfront comprises some 250 meters. There is no evidence of a clearly delimited zone existing between village and forest. To the north and east, a dense, low covering of second growth vegetation (zone 6) creates an irregular demarcation between the inhabited areas (zones 9, 10) and the forest perimeter (zone 2) (FIG. 6).

The dwellings themselves are mainly located between the principal landings, in an alveole-shaped zone of bare soil (zone 10) parallel to the river front. The total absence of vegetation and the extremely worn surface of the ground surrounding the habitations would indicate that this area corresponds to the most ancient portion of the village. On the northern and eastern sides of the village a few dwelling units are scattered in extension areas which are opened in a second growth vegetation zone (zones 6, 4), with paths showing traces of vegetation (zone 9) (FIG. 7). Planted trees, like mangoes, coconuts or various palms, are associated with domestic constructions and bands of heavier vegetation which form natural divisions between various sectors of the village.
The village of Loca contains 76 constructions which can be grouped in "compounds" and "quarters." The "compounds" are composed of densely grouped constructions oriented towards a common open space. They are characterized by an identical orientation of roof lines and of entrances on the main facades. The compounds comprise from five to ten habitations arranged in three main types of geometrical patterns: circular, linear and parallel (FIG. 8).

The most remarkable form is a roughly circular or semicircular pattern, generally 30 meters in diameter with the habitations arranged along the perimeter. An isolated structure is sometimes found within the interior of the central common space. The linear compound consists of a short alignment of habitations oriented along either side of a central path. The alignments are not perfectly parallel and often produce a slightly inflected V-shaped configuration. As for the parallel series which can be observed at the southern extremity of the village the habitations are here disposed in short slightly curved segments, all the main entrances opening towards the river. The exceptions to those basic patterns are an isolated construction and the small group of five units at the northern extremity of Loca which looks like a strict alignment produced by a planned project.

The "quarters" comprise a few compounds in close proximity, each being separated from the others by an open space or a barrier of vegetation. Three main quarters of this type were identified within the most ancient portion of the village clearing. The first is composed of 27 habitations situated in proximity to the principal landing site. The distance between the structures is small, being generally on the order of two to three meters, with occasional examples of habitations with touching lateral walls. The second is adjacent to the secondary landing site, and also comprises 27 structures with a greater separating distance than those of the first. A third connects the two others and contains a dozen structures without direct access to a river.
In the extension areas, two different quarters are developing in the eastern part of the village and in the northern part (quarter 5).

The interpretation of aerial photographs generally provides little information concerning the typology of village architecture. Nevertheless, the analysis of the dimensions of the ground surface occupied by each construction indicates the existence of precise modular classes permitting a differentiation between several types of structures.

The dimensions of the ground surface occupied by the constructions is calculated by a measurement of the roof projection (FIG. 10). The basic rectangular dimensions correspond to modules of four and six meters, as observed in a series of constructions of 4 x 6, 4 x 8, 6 x 8, and 6 x 10 meters in roof projection. In these examples the entrance is located under a gable extending over the main facade. The absence of entrances on the lateral facades can be confirmed by the close proximity of the habitations to one another, which can be noticed in a few densified compounds. Relatively square roof projections correspond to basic modules of eight meters, producing dimensions of 8 x 8, 8 x 10, or 8 x 11 meters. The only exceptions to these basic modules are a very large and isolated construction, more than four hundred meters from the southern extremity of the village, known as "Habitation Creole" (whose roof projection measures 11 x 15 meters), and the...
few "planned" constructions located at the northern extremity of Loca which have identical 5 x 7 meter roof projections.

Thin parallel strips of corrugated iron roofing are distinctly visible on some constructions, and most of the structures are probably covered with this material. However, thatch roofing, which is less visible in photographs, could be used occasionally.

The village also contains structures which are too small to be habitations, whose roof projections vary between 2 x 4 meters and 2 x 5 meters. When separated from the compounds, they were generally classified as shrines, covered altars, or small huts containing ritual objects. When in direct proximity to the compounds, they were assumed to be shared kitchens.

The results of this purely visual analysis of the spatial organization of the village of Loca by means of photo-interpretation permitted the identification of some spatial effects of patterning. The environment of the village and the settlement itself seem to illustrate characteristic forms. But this information can only contribute to a valid anthropological hypothesis if it permits the constitution of a working model of the morphology of Maroon villages in general and allows an explanation of some particular aspects of the social and cultural structures of Maroon society.

A MODEL OF THE MAROON VILLAGE

Our comparative series of aerial photographs included four traditional Boni villages situated along 15 kilometers of the Lawa River: L'Enfant Perdu, Agode, Assissi and Cormontibo. We also included Cottica, located approximately one kilometer downriver from L'Enfant Perdu on the opposite side of the river, in Surinam. Cottica was formerly a Boni village and may be considered as being culturally and physically homogeneous relative to the other sites. An additional site was also included to serve as a control, and it consisted of an oblique aerial view at approximately 1:1000 scale which appeared in a previously published study by Price in 1980. It was identified as being "a Djuka village in the Tapanahoni region in 1972."7

The region of Tapanahoni is difficult to reach and was less affected by the phenomena of migration and modernization than other areas of Maroon habitation. Conversely, the Boni villages situated along the Lawa River have been greatly modified by migration and the interventions of the territorial administration. It therefore appeared necessary to utilize a relatively intact village as a point of reference and comparison.

In comparing the observations made about Loca to the morphology of the four other Boni villages, we integrated elements common to each site as being significant components in a model of the traditional village in general. A comparative table indicates the constancy of formal characteristics as well as variations in villages' organization (FIG. 11). On the basis of these characteristics we formed explicative hypotheses relating the morphological model to the Maroon social structures.

AN ECOLOGICAL MODEL: VILLAGE AGRICULTURAL CLEARINGS

The characteristics chosen to represent the village environment include the localization and size of the agricultural clearings, their specific aureolar form, and the presence of zones of second-growth forest vegetation. To fully comprehend the formation of the agricultural clearings, references to ecological and economic factors were made.

The presence of agricultural clearings in the form of aureole-shaped units of 100 meters in diameter is common to all of the sites studied. This pattern may thus be considered a fundamental element of the model of Maroon villages, and represents a basic cultural constant.

The division of the Boni tribal lands into independent matrilineal villages corresponds to precise ecological limits of agricultural exploitation. According to Grenand, "an indigenous community comprised of more than 120 persons in Guiana cannot hope to maintain a sufficient level of subsistence by the four traditional activities of hunting, fishing, fruit-gathering, and shifting agriculture . . . an agricultural plot cultivated for more than three years becomes not only unproductive, but also unregenerable."8
The localization and size of village agricultural clearings would therefore seem to be determined by factors of accessibility and the possibility of the regeneration of the vegetation. It is significant that the agricultural clearings of Loca, Assissi and Agode correspond to this model, whereas the overexploitation of the lands surrounding the modern housing development of Pompidouville has engendered a near sterility of the environment, and agricultural activity has all but ceased in the village of l'Enfant Perdu. These variations in the Boni village landscape reflect the perceptible transformation of a traditional subsistence economy into an exchange economy characterized by an abandonment of small scale agricultural activity in favor of intensive exploitations that are ultimately destructive of the village environment, or by the mere suspension of agricultural exploitation of the rain forest.

If the size of the traditional agricultural zone corresponds to precise ecological constraints, the circular form of the individual plots constitutes a specific cultural trait. A comparison of the Boni agricultural clearings with those of the Wayapi Amerindian tribe reveals that the latter clear their plots into irregular forms. The repetition of the circular pattern and the constancy of dimensions of the Boni agricultural clearings can thus be considered basic elements of a model of the ethnic organization of space.

VILLAGE CLEARING AND AGRICULTURAL CLEARING

An understanding of the process of formation of the Maroon residential clearing must take into account both the global form of the inhabited zone and the existence of the circular compounds. All of the villages studied are constructed in close proximity to the river, either upon its banks, as with l'Enfant Perdu or Assissi, or slightly set back when
the banks are steep, as in the other villages. In general the villages always utilize the greatest possible area in direct contact with the river. The residential clearing of Loca contains a transitional zone of heavy undergrowth separating the constructions from the forest, which appears to be an atypical characteristic.

In Cormontibo large open spaces separate the village of the modern development of Pompidouville, but nevertheless the northern limit of the village still appears like a clearing opened in dense vegetation. All of the other villages occupy cleared areas enclaved within a dense forest environment without intermediary zones separating the residential area from the forest. All of the villages studied are of multi-lobed form, recalling the aureolar pattern of the agricultural clearings (FIG. 12). This pattern is less visible in Loca, where it can only be seen from the air in the traces of the path system traversing the oldest portion of the village. In the other sites, including Cormontibo, the series of circular residential clearings appear as a basic element of the inhabited area.

The circular disposition of the constructions arranged in groups of five to ten around a common space of 30 meters in diameter also constitute a basic form visible in all the sites studied. The rather small and nondensified village of L'Enfant Perdu gives evidence of the making of the village form by the development of modular circular units, adjacent or connected by linear segments. In this case only three main areas of 30 meters in diameter have been cleared in the dense vegetation. Another circular clearing commences just behind one of these units, and a short linear segment connects the two other circular clearings. This simple form is perfectly illustrative of the process which results in more complex multi-lobed organizations in large and densified settlements.

The development of a village by the multiplication of circular clearings of habitation producing a multi-lobed residential area set within a dense forest environment resembles the pattern already identified in the agricultural clearings. The residential pattern is of a smaller 30 meter diameter, as opposed to 100 meters for the agricultural units. Its development is always associated with the availability of one or more river landing sites, which is a determinant for the initial implantation of the village. The circular pattern would thus appear to be a common element of agricultural and residential clearings and explains the similarity of both. The village is thus in many ways a variation of the agricultural clearing, characterized by its proximity to the river and the presence of habitations.

The almost invariable dimensions of each -- 100 meters in diameter for the agricultural clearings and 30 meters in diameter for the circular residential compounds -- suggests a hypothesis concerning the social structure of the Maroon villages. The composition of these compounds containing from five to ten constructions, of which one or two are probably kitchens, would in our opinion appear to correspond to that of the groups which exploit related agricultural clearings. The agricultural plots would thus furnish a part of the alimentation necessary for the subsistence of its corresponding unit of production and consummation.
The hypothesis seems corroborated by congruent field observations concerning the composition of Boni villages. The studies by Hurault\(^9\), or our own recent surveys\(^9\), suggest that the unique factor determining a preferential localization of habitations is the existence of a direct uterine link between the respective neighboring households of a compound. It is exactly this same uterine domestic unit which cultivates given agricultural plots, which in general are cleared by the husband of the lineal mother, or in his absence by a son or brother. The matrilocal residential system implies that the mother’s children live in close proximity to the maternal household. The mother, her children and grandchildren would thus constitute a domestic unit of consummation and production cohesive within the residential and agricultural space.

The hypothesis also appears coherent in relation to two fundamental aspects of the traditional social structure, namely the presence of a subsistence economy and the matrilineal family organization. It should nevertheless be noted that this model corresponds only to the compounds which have not become dense, and does not explain the presence of heavily constructed sectors resulting in the englobation of the basic households by a proliferation of additional units.

**The Village and Tribal Unity**

To comprehend the diverse aspects of the forms of the villages studied, their social structure must not be reduced to a mere interconnecting system of matrilineal family compounds despite the explanations thereby provided. The joint possession of the soil, the discontinuity of the quarters, and the presence of dense sectors of population also appear as constant elements of the village model even in the most traditional example of residential organization offered by the Djuka village in the Tapanahoni region.

The absence of delimited parcels of land within the village clearing is common to all of the sites studied without exception; fences or pre-established limits between habitations appear only within the context of the government housing projects, and were not observed in the older villages we studied. The discontinuity between quarters composed of a few compounds is a characteristic of all of the sites with the exception of the smaller village of l’Enfant Perdu which is comprised of a single quarter.

Distances between constructions in traditional villages vary from one quarter to another and appear to be the result of a process of gradual densification. Beginning with an initial group of constructions spaced from five to ten meters apart, the addition of new structures creates in certain cases a total saturation of the habitable space, as can be seen in certain quarters of Cottica and the Tapanahoni village. But in sectors which can be considered as village extensions the basic five to ten meter distance is always respected.

It would be logical in a society dominated by a consistent lineal institution that the organization of the village should correspond to the social divisions in separate kinship classes. The Boni matrilineages, for instance, are subdivided into fractions referring to distinct ancestral lines explicitly mentioned in genealogies. But in the actual organization of the settlements, it is in fact the matrilineal community or even the tribal solidarity which dominates over any kind of institutional segregation.

There appears to be no relation between the existence of discontinuous quarters within a village and the reference to different fractions of the matrilineage. Even when some individuals or entire households belonging to another matrilineage decide to settle in a village they are not separated from the other villagers in a distinct quarter. They just build a new house in one of the existing compounds.

As the densified compounds may include households of various origins, uterine kinship thus constitutes the preferential rather than the exclusive form of social neighboring organization. The relative absence of influence of kinship structure on residential localization indicates that in Boni society tribal cohesion prevails over all other partial forms of solidarity between kinship groups.

Nevertheless, a more traditional model of residential organization may have existed anteriorly, and would probably have resulted in the constitution of compounds composed of uterine kin exclusively,
with quarters organized into lineal fractions and strictly matrilineal villages. The model corresponds to the traditional lineal classificatory schemes and would have left lasting traces only in the composition of compounds for economical reasons. The uterine group is both a lineal group and an agricultural production unit. Contrary to the lineal fractions which existed only in relation to a system of rights and duties of a symbolic order, the uterine domestic unit would have been capable of offering greater resistance to the forces of disintegration present within the rapidly transforming traditional Boni social structures in French Guiana.

THE INFLUENCE OF COLONIAL URBANISM ON MAROON VILLAGES

The linear arrangement of constructions visible in the organization of the village residential areas were unlikely to have been derived from the circular patterns of the agricultural clearings. We attribute its origin to the influence of colonial urban patterns which may also have formed the basis of the typology of the "traditional" Maroon habitations.

The construction of slave quarters upon the colonial plantations resulted in the erection of identical series of small cabins arranged in precise rows in a quasi-military pattern. According to Buisseret "... it is difficult to determine the nature of the construction materials utilized to build the cabins, but it is noteworthy that they were rectangular and arranged in precise rows." The form of these quarters may have varied from one region or even one plantation to another, and it would be necessary to inventory the precise patterns existing on the Surinam plantations from where the slaves marooned. As a drawing by Stedman illustrates, the characteristic arrangement in "precise rows" used in the military settlement constructed at "Devil's Harvar" on the Cottica River in Surinam, we already know that this basic form was current in these regions, and would appear to have been retained as a model after the slaves fled the plantations. The presence of linear alignments of habitations in unique or face-to-face orientation in Maroon villages may thus be derived from the colonial model.

The actual form of the Maroon habitations may also have been adopted from the typology of the colonial slaves' cabins, which were small, rectangular, and covered by a double-sloping roof with a gable extending over the entrance on the main facade. The presence of semi-enclosed kitchens situated in proximity to the habitations in the traditional Maroon villages, a common characteristic of the slave quarters, may also have been derived from the colonial mode.

The most ancient Boni habitations consisted of several types of more or less elaborate constructions which all supposed the same distribution of domestic activities and focused on the central open common space of compounds. The habitable space of dwellings was always limited and comprised two small rooms separated by a low partition. The smaller front room contained the domestic utensils, while the second served as the bedroom. The threshold was protected by a long prolongation of the roof gable, and the facade was decorated with inlays, carvings, or painted designs. Cooking was done in a separate semi-enclosed kitchen located in close proximity.

According to Berthelot, Boni habitations are in several ways similar to the habitations of Caribbean populations of non-crossbred African origin residing in Haiti, Puerto Rico and Saint-Lucie, and are significantly different from Creole vernacular architecture. The similarity would appear to result less from the common African origin of the population than from the influence of the institutions of slavery. The question thus arises as to whether Maroon habitations can be qualified as "traditional" constructions. It is our belief that it would be more accurate to designate them as "initial" models of habitation, derived and progressively adapted from the colonial slave habitations (FIG. 13).

In present-day Boni villages the small and medium sized habitations also comprise two rooms under a gabled roof. Larger and approximately square constructions based on the exogenous Creole model contain four rooms often enclosed by a porch or veranda, and are often slightly elevated upon piles. The spatial organization as well as the larger dimensions of these habitations suggest that domestic activity is oriented more towards the interior than the exterior, which is the contrary to traditional Boni habitations. The presence of exogenous mod-
els of habitation such as the Creole-styled constructions within the Maroon village environment would appear to be a factor in the destructuralization of the organization of the residential areas by the reduction of what were formerly common open zones to the function of mere circulation. This probable transformation is a contemporary example of the dependence of Maroon society upon culturally exogenic models, a dependence which had already determined the formation of their initial habitations.

**THE EVOLUTION OF TRADITIONAL MAROON RESIDENTIAL STRUCTURES**

Our study of traditional Boni villages of French Guiana revealed a model of which the essential features are probably also present in the patterns of residential organization among the Maroon population of Surinam. Directly related to the agricultural system, it would also appear probable that the traditional Maroon village structure is destined to be transformed by the successive mutations of the economic equilibrium.

The Maroon population has never lived under a system of veritable social and economic autarchy. The initial bands of fugitive slaves raided the plantations for the indispensable goods necessary for their survival; later the Europeans offered tribute to village chiefs in the form of diverse products and objects, and monetary exchanges ultimately developed between the Maroon and coastal populations. At present the economic equilibrium of Maroon society is being increasingly modified by the effects of a money economy based on wage labor, which has engendered a corresponding diminution of traditional agricultural activity, particularly in French Guiana.

During the census survey conducted in 1982 of the villages of Agode, Loca, Assissi, l’Enfant Perdu and Cormontibo, only 50 percent of the households were still present or continued to cultivate agricultural plots. The villages display a constant regression of traditional agriculture in favor of activities related to a money economy. Large numbers of village inhabitants had migrated (and continue to migrate) to the coastal cities of Cayenne, Kourou, Saint Laurent du Maroni, Paramaribo, or the township of Maripasoula, where they generally obtain temporary work as day laborers. Simultaneously, a legal form of individual property of soils is imposed on the Boni by French local authorities, which is likely to contribute to the dissolution of the form of the traditional settlements.

The French national system of jurisprudence is at present applied throughout French Guiana, result-
ing in the classification of the Maroon forest habitat as "Domainial Property" of the state. The territorial administration thus has the legal right to develop public service facilities or to allocate parcels of Maroon lands to private concerns through leasing arrangements or outright sale. In fact, up to the present no restrictions have been placed upon exploitation of forest lands by the Maroon population. Such is not the case of the Maroon villages themselves, which have undergone progressive cadastral classification initiated by local administrative units.

Such practices are the antithesis of the lineal village system and of the principle of common undivided access to village lands which characterizes traditional Maroon society. At present an unofficial compromise between official policy and tribal tradition has produced hybrid forms of residential organization in which traditional settlement patterns coexist within the formal context of the administrative planning grids.

Apart from fragmentary indications, there are no precise statistics permitting the evaluation of the extent of the migratory movements of the Maroon population from Surinam to French Guiana and within French Guiana itself. In 1980 the Maroon population of Surinamese origin inhabiting French Guiana was evaluated at 8,000. As a result of the recent civil war in Surinam, 8,000 - 10,000 additional persons have fled to French Guiana since 1986. It is possible that at present up to half of the Maroon population of Surinam, estimated at approximately 40,000 in 1980, now resides in French Guiana, the majority living in or near the coastal cities. The indigenous Maroon population of French Guiana is approximately 1,800, comprised of an estimated 1,000 Boni and 800 Paramaka. Roughly 40 percent of these individuals have migrated from inner territories to coastal towns, according to the administrative census.18

The migrants did not settle in permanent habitations but developed all sorts of minimum units of dwellings, all of them regarded as temporary shelters. Up until the early 1960s migratory movements generally concerned the male population exclusively. Migratory workers lived in cabins or barracks placed at their disposition by their employer, or rented inexpensive rooms in the cities. This is still the case for individual male migratory workers, but the arrival of a new migratory population composed of entire households has resulted in the

**FIGURE 14.** Spontaneous Maroon settlement at Kourou 1984.
have constructed a dense concentration of make shift habitations partly elevated on piles on a narrow, flood-prone strip of littoral bordering the river. At Kourou, approximately 600 Maroon migrants inhabit a temporary village erected on marshlands during the construction of the space center (FIG. 14). At Cayenne, Maroon migrants joined the shanty towns previously developed by Haitian and Brazilian transient workers in the suburbs.

Despite the varying degrees of extreme insalubrity of these sites and the precarious nature of the habitations, elements of traditional spatial organization can occasionally be observed in those spontaneous settlements. Thus at the locality of La Charbonnière, situated to the south of the urban agglomeration of Saint Laurent, the migrant population disposed of a forested zone bordering the river, which permitted the creation of a settlement whose organization was initially comparable to that of a traditional Maroon river village. An aerial view of La Charbonnière taken in 1978 indicates that the settlement resulted in a multi-lobed clearing oriented toward the river with several pirogue landing sites, enclaved in a dense vegetative environment. The small and medium-size rectangular habitations were grouped in circular or linear patterns of five to ten, with no visible evidence of land enclosure (FIG. 15).

By 1986 the settlement had undergone an extreme morphological transformation, caused by the urbanization of the surrounding environment as well as by the modifications of the inhabitants themselves, which included the erection of habitations of large dimensions constructed of concrete blocks upon cement posts. Several prolongations of the initial settlement had developed to the rear as in the village of Loca. But in this case the new habitations were oriented away from the river in the direction of an access road serving a nearby housing development. The entire aggregation is destined to receive a complete road system and community facilities, and will ultimately become a suburb of Saint Laurent.

These peri-urban agglomerations can in no way be considered Maroon villages in the traditional sense of the word, but studies which we conducted in 1981 and 1986 revealed the existence of some resi-
dential compounds based upon uterine kinship analogous to those observed in traditional villages. The studies also revealed the predictable tribal heterogeneity of the inhabitants, which, aside from the uterine compounds, were an extremely mobile migrant population.

The social and residential integration of members of the Maroon population within the dominant Guianese society is a very rare occurrence, characterized by their implantation in low-income, middle-class housing projects or older residences in the city center and the very occasional construction of modern homes in residential quarters. Up to the present, migratory patterns have still displayed a lasting cohesion of Maroon tribal groups, opposed to the residential discrimination which excludes them from Guianese society in many aspects. Their attachment to the territory and village of origin appears to be a determinant factor in the lack of assimilation of Maroon migrant population within the larger Guianese society. But children born in the coastal migrant settlement will probably not maintain the attachment to initial tribal territories and will undergo an effective and total process of assimilation to Guianese society.

THE ROLE OF PHOTO-INTERPRETATION IN ANTHROPOLOGICAL RESEARCH

Photo-interpretation is commonly employed in urban analysis as a descriptive technique completing the study of cartographical documents and site surveys. As long as the residential structures studied refer to familiar categories, morphological analysis does not yield specific problems in the process of interpretation. But when this technique is applied to structures and residential patterns illustrative of a logic foreign to the observer’s own culture, as is the case in anthropological research, the interpretation (and even the mere recognition of the forms) presupposes previous information on very specific social and cultural data (FIG. 16).

From an anthropological perspective, it is essential to consider photo-interpretation as only a technical phase in a larger process of investigation and analysis. Previous surveys and further investigations in the field are required to produce significant conclusions on residential structures, which are not only physical arrangements but determining features in a cultural context.

When using aerial photographs as basic information to develop a spatial study, the limits of the documents must also be emphasized to avoid misunderstanding the pertinence of information contained in them. The descriptive value of a view depends on the scale of the survey. The present study was exclusively focused on residential patterns in environmental and village contexts and did not treat questions of territorial organization or construction typology in a detailed manner. Such limitations were partly due to the nature of the particular photographic series utilized in our research, which was limited to 1:8,000 and 1:2,000 scales.

The stereoscopic images of 1:20,000 scale commonly employed in aerial photography would permit the representation of an entirely rural territory or ur-
ban landscape and offer a geographical overview of sites in which the typology of the terrain is clearly visible. The stereoscopic images of 1:10,000 to 1:8,000 scale, which were principally utilized in our study, permit a description of environmental structures, but were inadequate for the description of precise residential patterns. It was for this reason that we created a corresponding series of non-stereoscopic enlargements of 1:2,000 scale. But stereoscopic views of 1:1,000 would constitute the richest source of information for the analysis of residential patterns, and could be advantageously complemented by the creation of non-stereoscopic oblique aerial views which would represent essential details concerning the dimensions and the volumes of structures and habitations. However, aerial views are only a summary approach for the description of architectural typologies because they reveal only information concerning the external volumes of constructions.

Aerial photographs constitute an initial source of basic information which displays a total view of space when cartographical representation often ignores or suppresses essential elements in its coding. Such was the case for instance for the cadastral maps of Maripasoula elaborated in 1984, in which only the dwellings constructed by the administration were present with no reference to spontaneous units (FIG. 17).

With the complete information photographs provide, the quality of the morphological interpretation depends upon the pertinence of the classificatory categories employed. There is no unified system permitting the classification of the elements of space. Each corpus necessitates the creation of an individualized approach. But if the categories themselves are the result of empirical observation, their elaboration and development imply the utilization of a methodological approach analogous to the content-analysis of a given text. The classificatory categories should be exhaustive and exclusive and describe all of the visual aspects of a site without duplication. The accuracy should be such that two independent observers will produce an identical reading of all of the aspects of a given site.

It is to be emphasized that observation and classification should always be performed in blind coding by two analysts working in parallel, as was the case in the creation of our grid of categories. The recognition and delimitation of homogeneous zones is often difficult to establish since the limits between two similar sectors are usually imprecise. Laboratories specialized in the analysis of information gathered by methods of aerial detection increasing-
ly employ computerized systems of recognition and coding. In our opinion these are not appropriate to the limited scale of the phenomena under present consideration, although such techniques may be envisioned ulteriorly in the creation of more inclusive comparative analytical studies.

In conclusion, it is evident that the interpretation of aerial documentation permits only the most superficial comprehension of the physical aspects of space and cannot furnish the slightest information as to the social significance of the structures and patterns observed. But even if the documentation of morphological organization does not permit the resolution of questions pertaining to the social and institutional basis of the patterns of residential structure, it can perhaps suggest pertinent approaches to further on-site studies capable of providing the answers.

When applied to a culturally homogeneous site and coupled to a methodical procedure of investigation and analysis, photo-interpretation may constitute a decisive technological aid for the creation of a model of a traditional residential system. In a broader perspective, the same technology should also provide a pertinent method for the elaboration of a morphological classification of the forms of diverse types of villages, settlements, and residential or agricultural environments.

REFERENCE NOTES
3. J. G. Stedman, *Narrative of a five year's expedition against the revolted Negroes of Surinam in Guiana on the wild coast of South America from the year 1772 to 1777*, (London: Johnson and Edwards, 1796; reprinted 1971, Barre Mass Imprint Co.).
13. Stedman, *Narrative of a five year's expedition*.
18. Ibid.