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# The archaeology of Iwokrama and the North Rupununi

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ABSTRACT—Archaeological investigations within Iwokrama Forest document significant Archaic and Horticultural occupations throughout the Reserve. Significantly, no evidence of earlier Paleoindian occupations (pre-7,000 B.P.) is documented. The Archaic Period from 7,000 to 3,000 B.P. (before present) is characterized by a variety of site types including artificial stone depressions and sharpening grooves, petroglyphs and a lithic tool manufacturing station. Petroglyphs reflect the Enumerative and Fish Trap Petroglyph Traditions better known from the savannah and rivers in southern Guyana. Archaic Period sites are found along major rivers and in the Iwokrama Mountains. Horticultural Period occupations dating from 3,000 B.P. to the Historic Period (mid-18th century), include eight archaeological sites that have produced a wide range of vessel forms similar to Koriabo, Taruma and Rupununi types found elsewhere in Guyana. The occurrence of polychrome types by 3,000 B.P. indicates an early arrival of such styles in the area.

## INTRODUCTION

The archaeology of Iwokrama and the North Rupununi, Guyana (Fig. 1) is relatively unknown but has great potential for addressing important research questions in north-eastern South America. Investigations within the region are intended to provide much needed chronological control in establishing changes in the historic developmental periods of Guyanan prehistory and in assessing settlement pattern changes through time. Further, investigations in Iwokrama Forest and the Rupununi potentially can provide insights about transitions in food procurement strategies between early hunting and foraging groups and later populations. In this context the archaeological record provides knowledge of how and to what extent these transitions are associated with long-term environmental changes within the region. In the case of Iwokrama Forest, research provides important regionally comparative data necessary for developing broader analyses of the prehistory of the Guiana Shield (cf. Vacher, Jérémie, Briand 1998).

This paper first gives a brief overview of the history of archaeological investigations in Guyana. That, in turn, provides a basis for the second and third parts of the paper, which will summarize the prehistory and archaeology of the North Rupununi and Iwokrama Forest and develop important research questions relating to their archaeological records. These questions concern the antiquity of early human occupations, the origins and distribution of early hunting and foraging groups, and the beginnings of horticulture. I review major historical periods and the settlement-subsistence of the areas. Where possible, I discuss local and regional research questions and relate them to what is currently known of the archaeology of Iwokrama Forest and the Rupununi.

For newer work reported here, standard archival and literature searches and field investigations that include both survey and test excavations were used. This work was conducted between 1997 and 2000. The archival and literature reviews are based upon study of archival materials in the Walter Roth Museum of Anthropology, the Amerindian Research Unit, University of Guyana, as well as published and unpublished data from the region. I have also relied heavily on published and unpublished data from two field trips to Iwokrama (Plew 2002a, 2002b) and several visits to the north Rupununi (Plew & Pereira 2001, Plew & Saras 2001) and further unpublished data (Williams 1996) from surveys within Iwokrama. Unless indicated with a supporting reference, observations reported here are newly derived from recent survey work.

Surveys relied upon local informants to identify known archaeological sites. They were augmented with intuitive inspection of high probability areas primarily along river corridors. An exception is the recent survey along the western flank of Iwokrama Mountain (Plew 2002a, b). Test excavations have employed standard archaeological methods. The sizes of test units and of arbitrary excavation levels varied with setting and material densities. Methods of artifact analysis have included evaluation of technical properties of ceramics including hardness and temper, assessment of manufacturing techniques and the development of lithic and ceramic typologies as the basis for regional comparisons. Chronological determinations are based on typology and upon radiocarbon dates for two sites near Kurupukari Falls (Williams 1996).

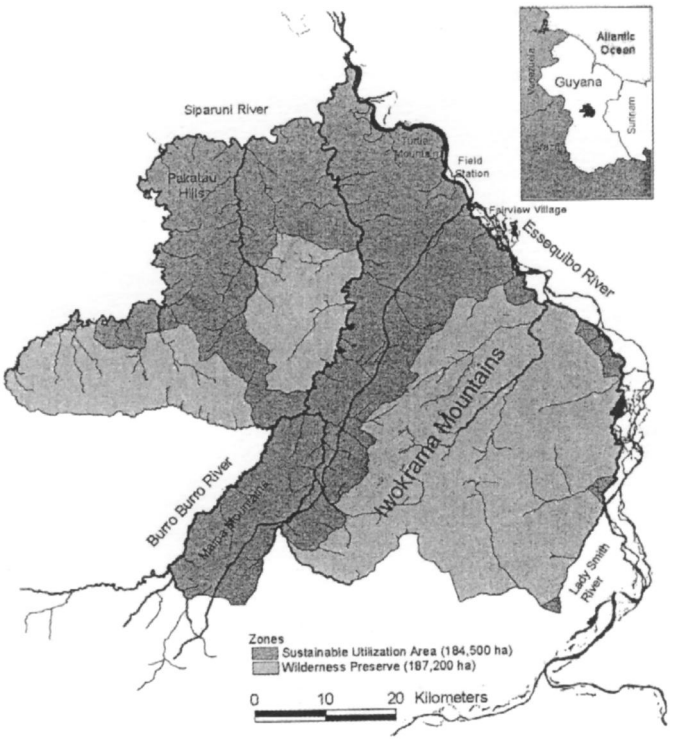


Fig. 1. General location of the Iwokrama Reserve.

## Cultural Historical Background

The prehistory of Guyana has three major periods. The Paleo-Indian Period is the earliest and dates from at least 12,000 years ago to 7,000 B.P. or perhaps earlier. It is associated with the end of the last great Ice Age and the hunting of large animals such as the giant ground sloth. During this period, early peoples appear to have intruded into and through southern Guyana as they moved into northeastern Brazil. Though little is known of them, they produced well-crafted, triangular-bladed projectiles sometimes made from quartz. After modern environmental conditions appeared some 7,000 years ago, the second period, the Archaic Period, saw the first Meso-Indian hunter-gatherers appear on the northwest coastlands and in the Rupununi savannah. On the coast and around the swamps of the northwest and Pomeroon areas, numerous shell middens reflect the extensive use of a variety of shellfish. As a hallmark of this Archaic period, multiple resource use becomes increasingly common (Williams 1985b). It is assumed that a variety of plants were used for food and construction materials. Because the Archaic period reflects considerable use of the forest, a range of new "groundstone" tools including axes, adzes and other woodworking and plant processing tools, appears in the archaeological record for the first time (Evans & Meggers 1960). In the Rupununi area various additional resources were seasonally available within microenvironments. Particularly important were the seasonal fish resources of the savannah. Archaic peoples also produced petroglyphic and pictographic rock art throughout Guyana. It appears that they also began the practice of preferential treatment of the dead. At the Barabina shell mound in the northwest, individuals were interred in flexed positions and with grave goods. In the southern savannahs, people were buried in a variety of contexts that these included burial urns and cairns.

The final period in Guyanan prehistory, the Neo-Indian or Horticultural Period, was from 3500 to historic contact. Peoples in the northwest, the Pomeroon, and in the coastal hinterland began cultivating several varieties of wild manioc. Many of the best known archaeological sites in Guyana date from this period and include Barabina, Hosororo, and Mabaruma, Tiger Island and Seba. During the Horticultural Period, populations became increasingly sedentary and began to produce a broad range of polychrome ceramics and griddles used in processing and preparing manioc.

## ARCHAEOLOGY IN GUYANA: AN OVERVIEW

The history of archaeological research in Guyana, though brief and inconclusive, provides a chronological/developmental framework for the second part of this paper, which will examine the archaeology of Iwokrama and the North Rupununi. Schomburgk (1841), Farabee (1918, 1924) and Roth (1924) all referred to archaeological sites, particularly petroglyphs, in Guyana but the pioneers of Guyanan archaeology were Brett (1868) and Im Thurn (1884). Their early excavations, including Waramuri mounds, and observations about the distribution and relatedness of material cultures, mark the beginning of scientific archaeology in Guyana. Early accounts of prehistoric cultures brought several excavators to the northeast and northwest regions of Guyana where a number of coastal sites were investigated early in the 20th century. Many of the early accounts, (e.g., Toro 1905), report elaborate sites characterized by quartz utensils, pottery adornos, and burial urns, but they provide little descriptive context. Guyanan archaeology in the late 19th and early 20th century is generally characterized by a lack of systematic investigation, and so must be considered a period of considerable speculation.

Verrill (1918) was among the first archaeologists to bring descriptive synthesis to the prehistory of Guyana. He discussed the material and geographic variability of Guyanan mounds. Defining variations in "hill top" and "shell heap" sites, he provided the first good descriptions of notable sites such as Akawabi, Kumaka, Koriabo and Barabina. He estimated shell mass at some 5 billion shells. Furthermore, his excavations indicate the enormous dimensions of the northwest Guyanan shell mounds. Most importantly, Verrill concluded that two distinct patterns existed: a lowland coastal pattern, like those in the Pomeroon region, and a second one found on inland hilltops. His speculations regarding the origins and migrations and habits of early coastal peoples are untenable but his descriptions of site contexts and material remains are important. Equally important are his investigations of sites in the Demerara area, particularly along the Abary River (Verrill 1918).

Cornelius Osgood's 1944 explorations in the northwest and Demerara regions begin the descriptive-historic period in Guyanan archaeology. Asserting an Arawak affiliation for the peoples of the northwest District, Osgood noted similarities between Demerara-style potteries and the Los Barrancos style to the west. He argued that people lived on hilltop sites rather than using them exclusively for ceremonial functions, as suggested by Verrill (1918). Osgood's (1946) investigations are the first to adequately document excavations and suggest the need for a more rigorous and systematic approach. Next, and Meggers (1960) undertook the most regionally comprehensive investigations to that date. Spending several months in the field in 1952, the two visited the Rupununi Savannah, the Mabaruma area in the northwest and the Abary River area. Their work led to the development of several phase chronologies, including the definition of the Rupununi and Taruma phases, among others, and the description of many ceramic types.

After Evans & Meggers (1960), little archaeological research was done in Guyana until the 1970s when Denis Williams initiated a series of studies in both the north and south of the country. The range of Williams's (1982, 1985a, 1992) work is broad, but his more important contributions include his discussion of petroglyphs associated with fisheries management (1985a) and the origins of horticulture in the Northwest of Guyana (Williams 1992), particularly as related to technological change. Though his work has been largely historical, his ecological perspectives provide insights regarding the varied use of resources within the tropical environment. In spite of these innovations, the history of Guyanan archaeology is founded in the tradition of culture history. As a result, the prehistory of the region remains very much in a pioneering stage.

### Early Peopling of Guyana

Pressure-flaked triangular points, endscrapers, hearths, diverse extinct and modern fauna, and pigments in stratigraphic relation to rock art characterize many of the earliest assemblages. In addition, large stemmed points are associated with contexts generally dating between 15,000 and 7,000 B.P. (see Meggers & Miller 2003 for discussion). Further, Late Pleistocene assemblages dating between 13,500 and 11,800 B.P. in Venezuela and Chile document a range of bifacially prepared projectile series including willow leaf forms similar to the El Jobo type of the Rio Pedregal sequence and contracting stemmed points commonly known as El Inga, and Pali Aike fish-tail points (see Lynch 1998).

In general, considerations of early human occupations in South America have largely ignored Amazonia. This has arisen in part upon the longstanding biases of anthropologists and archaeologists regarding the nature of the Amazonian environment. Traditionally viewed as an ecological barrier providing scarce resources (Meggers 1971), the Amazon Basin was seen as having limited the potential of aboriginal peoples for cultural development. Meggers's (1971) developmental model, which broadly reflected the diffusionist models current in archaeology of the 1950s and 1960s, implicitly reinforced the view

that there was little likelihood of discovering evidence of Paleoindians in the Amazon. In addition, the commonly held view that the Amazon Basin lacks the necessary lithic sources for tool production conveniently fit the debate regarding Clovis technology. Despite the bias of North American archaeologists, scholars who have recognized the richness of the Amazonian environment and the innovation of technologies adapted to the utilization of arboreal fauna have argued for a cultural pattern co-existing or coeval with the North American pattern (see Bryan 1991).

Roosevelt et al. (1996) provide convincing evidence of a pre-Clovis occupation from sites along the lower Amazon at Pedra Pintada near Monte Alegre, Brazil. Based on 56 radiocarbon dates from carbonized plant remains and 13 thermoluminescent dates from burned lithics and sediments, they document an impressive series of occupations between 16,000 and 10,200 B.P. Most importantly, the majority of dates fall between 12,000 and 10,000 years ago, a period contemporary with the North American Clovis. The occupational levels are characterized by the following: bifacially produced quartz spear points of the type found at Lagoa Santa (Hurt 1960; see Lynch 1998 for discussion) and elsewhere in Late Pleistocene/Early Holocene contexts, other bifacial implements, pigments in stratigraphic relation to cave paintings, and a wide variety of plants including fruits, berries, and palm, and faunal remains that include fishes, mollusks, turtles, tortoises, birds, rodents, and small and large mammals.

Roosevelt et al. (1996) demonstrate that some Paleoindians were contemporary with North American Paleoindian cultures and that they were rock-painting, river foragers of tropical forests. They provide evidence that Paleoindians were more complex, widespread, and diverse in their adaptations than formerly believed. Their work strongly implies that the North American Clovis pattern is not the sole source of migration into South America. Notably, it suggests that early human development was not limited to or impeded by the tropical environment.

In Guyana, little technology and no faunal remains have been found which suggests a megafaunal pattern (see Williams 1985b: 6). Suggestions that this pattern exists are based in part on the convention that the Rupununi is a remnant of a larger Pleistocene Savannah extending along the periphery of the Amazon during glacial maxima when Amazonia was substantially smaller than at present (Van der Hammen & Absy 1994) and that it served as a corridor through which early peoples migrated into Brazil. Williams (1985b) argues that so-called Meso-Indian or Archaic hunter-gatherers emerged on the Savannah ca. 7,500 B.P. and were characterized by bifacially worked projectile points, crudely chipped stone implements, and elaborate petroglyphs. The chronology of the "Rupununi Archaic," which may be correct, is at present based on typological comparisons with relatively older assemblages in other areas of South America. This is particularly true of many of the simple tools reported for the region.

Williams (1985b) argues that an early occupation in northwest Guyana beginning around 7,000 y BP would have originated in the vicinity of the Aruku Hills and Barima River. It was distinct from the occupation of the savannahs in its emphasis upon littoral resources and in particular upon the molluscs of mangrove swamps. Its material culture is composed of the simplest chipped stone tools and a few simple woodworking tools adapted to forest exploitation.

However, the Im Thurn collections (Museum of Anthropology and Archaeology, Cambridge) suggest that an early Paleoindian-like occupation may have existed in Guyana. Contained within the collections are three triangular-tanged and bifacially worked projectiles made from quartz crystals, and numerous small relatively amorphous chipped stone items that fall within the range of materials typologically characterized by the "Edge-Trimmed Tool Tradition" (Hurt 1977; Plew 1997). Two specimens were collected near the Barima River and an additional specimen is from the Essequibo River. In addition, Williams (1985b) reports a similar projectile from near the Ireng River on the northern perimeter of the Rupununi. These projectiles are virtually identical to the Paleoindian specimens recovered by Roosevelt at Pedra Pintada on the lower Amazon, by Hurt (1960) at Lagoa Santa in Brazil, and at several other locations east of the Andes (see Lynch 1998; Simoes 1976).

Williams's (1985b) description of the Archaic lifeway is strikingly similar to Roosevelt's description of a "broad spectrum Archaic foraging strategy" typical of some tropical forest peoples during Paleoindian Period. In light of these recent studies, the antiquity of this pattern in Guyana may prove to be greater than thought. Hence, the discoveries at Pedra Pintada suggest the possibility of a more extensive use of the tropical forest of northern Guyana and of the bush forests of the Rupununi in the earlier Paleoindian Period.

## Archaic Shell Mound Pottery in Northern Guyana

As it becomes clearer that early Paleo-Indians were more varied in their adaptations than previously thought, so too it is obvious that later, Archaic peoples also exhibited considerable variation in their adaptive strategies. This is particularly well demonstrated by the specialized shell midden adaptation

and the apparently early production of pottery. Excavation of the shell mounds of northern Guyana forms the core of the archaeological investigations conducted in the country. As an early focus of archaeological excavations, the mounds were generally considered to be of preceramic age. Though ceramics have been recovered from a number of sites including Hosororo Creek (Williams 1992), these materials have been interpreted as belonging to the Alaka phase (*sensu* Evans & Meggers 1960) and dated between A.D. 1 and A.D. 500. Currently, the earliest dates for shell mounds in Guyana are uncalibrated dates of 4,115 ± 50 and 5,950 ± 50 B.P. for levels from Barabina mound (Roosevelt 1995: Table 1; 1997a). If the dates are accurate, the occupations of the shell mounds predate the ceramic horizon. This is of note as Roosevelt (1995) has argued that secure radiocarbon dates from shell mounds in Amazonia establish the presence of pottery in the region earlier than the mounds in northwestern South America from which the earliest potteries are believed to have derived. This assertion contrasts with Evans & Meggers (1960) who felt that ceramics and agriculture were introduced to the Amazon Basin from the Andes in relatively recent prehistory.

Of further importance in establishing the early presence of Archaic shell mound pottery is evidence from excavations at Hosororo Creek (Williams 1992). Hosororo Creek is described by Williams (1992) as consisting of a Mabaruma phase component stratigraphically situated above an Alaka phase Archaic pottery shell mound component (see Roosevelt 1997a:358). If correct, the dates at Hosororo Creek would again suggest a longer chronology for Archaic shell mounds in Guyana. Radiocarbon dates and associated cultural materials from two trenches (Cut 3 and Cut 2) indicate that the majority of pottery is from pre-4,000 B.P. levels (see Roosevelt 1997a:358–360 for discussion). Indeed, the greater number of sherds (373 vs. 218) was recovered between 60–110 cm in Alaka Phase levels.

Williams (1996) offers a "re-characterization" of the Mabaruma phase as an *in situ* development on the lower Aruka River associated with a Proto-Maipuran Arawak intrusion around 1,600 B.C. He argues for three periods of development, which include an Early Formative culture between 1,600 B.C. and ca. A.D. 500, a Classic Mabaruma period between A.D. 500/700 and A.D., 1,000, and a Late Mabaruma period between A.D. 1,000–1,600. The Early Formative Period is characterized by broad line incising characteristic of the Incised and Modeled Traditions, whereas the Classic Mabaruma Period exhibits evidence of Barrancas Incised and Barrancas Modeled Incised. The Late Mabaruma is characterized by the appearance and predominance of Aposteederan ceramics, which combines elements of Araquinoid and Barrancoid ceramics. Williams's (1997b) recent work seems to indicate that pottery may exist earlier than the A.D. 1–A.D. 500 estimated by Evans & Meggers (1960:334). Williams's reconfiguration of the Mabaruma phase suggests the possibility of a longer chronology of the Guyana shell mounds than has been traditionally accepted. This possibility establishes the need for additional investigation of Roosevelt's (1997a) assertion that the Guyana pottery may be older than that of the Mina phase at the mouth of the Amazon. Williams's (1996) recent reassessment of the Mabaruma phase, however, has in this context significant implications for the Pre-Formative/Formative interface and thereby for the debate with Roosevelt.

## Human Ecology and Horticultural Origins in Northwestern Guyana

The past two decades of archaeological research in Amazonia have emphasized the nature of early human ecologies and the emergence of horticultural patterns throughout the region (e.g., Roosevelt 1991; Stahl 1994; Versteeg 1984; Williams 1992). These analyses have documented a greater complexity and range of human adaptations. In this regard, Williams (1985b, 1992, 1996) addressed the emergence of the Archaic Tradition and the beginnings of horticulture in northwest Guyana. Williams (1985b) observes the complexity of the littoral ecosystem and notes a number of commensurately complex exploitive strategies. In large part these are based upon ethnographic and historic depictions of resource use for the region. Williams (1992) asserts that adaptation to a complex environment led to the development of highly specialized lithic tools that changed little over time (Williams 1985b:22).

The transition from the Archaic to the pottery-producing Horticultural Period must also be documented beyond the traditional presence of ceramics, grinding implements and griddle fragments. As the horticultural Mabaruma pattern in the northwest dates relatively early, evaluating the emergence of horticultural strategies that reflect the optimality of resource use by Amerindian populations is essential. Since Williams (1985b) has already demonstrated the nutritional importance of shellfish, future questions may reflect why native peoples shifted their focus from the productive exploitation of such resources and to investment in horticulturally based economies. A further question may address one of the definitive hallmarks of the Formative period, in particular, whether pottery, occurs much earlier than its presumed appearance and not in the context of what has been believed to be a horticultural pattern. The relationship then between material cultures and

subsistence strategies must be understood through multiple integrated matrices. The assertion that tools reflect the environment is convenient for the cultural historian but fails to assess the varied complexity of human adaptive strategies.

## ARCHAEOLOGY OF THE NORTH RUPUNUNI

The Rupununi savannah comprises nearly half of Guyana (Williams 1979) but its archaeology (see Evans & Meggers 1960, Williams 1979a, 1985b) is relatively unexplored. The archaeology of the North Rupununi is inextricably connected to the archaeology of Iwokrama Forest because peoples of the forest and savannah moved widely in early prehistory maximizing their use of both environments. Developing an understanding of the range of sites and cultural materials found in the Rupununi provides important comparative data necessary to assess the use of the Iwokrama Forest. Hence, review of the archaeology of the north Rupununi provides a framework for evaluating the cultural context of Iwokrama. In the context of the general questions posed in the Introduction, this evaluation addresses issues of chronology, material assemblage diversity and settlement.

### Paleo-Indian Period

Evidence of the Paleo-Indians in the Rupununi is limited to a few discoveries including Williams's (1985b) report on a Paleo-like point from the Ireng River. Additionally, Plew (1997) identified a second triangular quartz specimen from the Im Thurn collections (Cat. No. Z997) that was collected on the Ireng River. An additional specimen from the Mariwau area in the Rupununi has been identified (Plew & Saras 2001).

### Archaic Period

*Sensu* Williams (1985a), Archaic artifacts include chipped and groundstone artifacts (Evans & Meggers 1960, Roth 1924, 1929, Williams 1978); features include rock alignments (Brown 1876, Henderson 1952), rock circles (Brown 1873, Henderson 1952) and rock piles (Henderson 1952), grinding surfaces or depressions and sharpening grooves (*pollisoirs*) and petroglyphs. Earlier explorers in the area noted petroglyphs in the north Savannahs (see Hortsmann and Tollenaer in Harris & Villiers 1911), while additional glyphs have been described by Brown (1876) on the Kwitaro. Petroglyphs have also been reported by Dubelaar & Berrange (1979), Hanif (1967), Poonai (1970) and Goodland (1976) at Aishalton and at Shiriri Mountain (Plew & Pereira 2001). The extensive studies of the rock art at Aishalton and on the Essequibo and Kassikaityu rivers by Williams (1979a, 1985b) lay the foundation for rock art studies in Guyana. They also are the basis for his thesis that the sign-posting of petroglyphs served an important function in fisheries management. Williams (1985b) considers these artifacts and features to date to the pre-horticultural (Archaic) period. It appears likely that many of the Archaic artifacts and features are also associated with later horticultural communities.

### Horticultural Period

Evans & Meggers (1960) identified site types and pottery forms that serve as the basis for definition of the Rupununi Phase. Two pottery types, Rupununi Plain and Kanuku Plain, were described. They account for the majority of ceramics from the area. The seriation of these types suggests that Rupununi Plain becomes increasingly common over time. On the basis of associated historic items and the assumption that the Rupununi Phase was associated with the historic Makushi and Wapishana, Evans & Meggers (1960) concluded that the phase dated from the end of the 18th century. In this regard they viewed settlement of the savannah as a post-European phenomenon (Evans & Meggers 1960:326). Site types described by Evans & Meggers (1960) include habitation, ceremonial, cemetery and petroglyph sites. Habitation sites include open villages such as Moco-Moco near Lethem and the Maubi-Wau villages to the south on the eastern Rupununi. The use of caves and rockshelters for habitation and perhaps other activities was noted at a number of sites including Wie-Wie-Tau Cave located to the south of Shiriri Mountain area. Wie-Wie-Tau represents a common pattern of sparse distributions of materials consisting primarily of a few sherds and occasional animal remains.

Cemetery sites are common in the Rupununi. They are either caves and rockshelters used for burials or ledges and walls of granite boulders upon which or adjacent to which burial urns were deposited. The former is well represented by Moco Moco, Bei-Tau and Tamrio-Wau shelters whereas the latter is characteristic of Upper Karakara. In the south Rupununi, ceremonial sites included locations adjacent to granite boulders where large shallow bowls of the Kanuku Plain type were found (Evans & Meggers 1960). Ceremonial locations, which included Marikanwauda and Mache-En-Tau, were not associated with other materials though a few white trade beads were found in the inside of the Marikanwauda vessel (Evans & Meggers 1960). To the north in the Annai area, ceremonial sites were reported to include stone alignments of the types described by Brown (1876)

and Henderson (1952). Evans & Meggers (1960: 300) failed to locate alignments of this type during their survey. They note, however, that alignments were reported to them by local residents. Equally important but not recorded were petroglyphs which are well known in the vicinity of Aishalton (Williams 1979).

Evans & Meggers (1960) described 76 chipped and groundstone artifacts defining the material culture of the Rupununi Phase. Made predominately from syenite, quartzite, sandstone and felsite, these include anvils, grooved axes, choppers, hammerstones, hoes, manos, metates, cores and flakes and two stone bowl fragments. More prominently represented are pottery vessels (N = 26) and sherds (N = 8,468) of the types Kanuku and Rupununi Plain. The pottery, which is found in a variety of surface colors from orange to reddish orange to reddish brown, is made by coiling and is characterized by three forms. One form has shallow to deep bowls with outsloping to almost vertical walls, direct rims and flattened to rounded lips. A second has globular bowls and jars with walls rounded and incurving with rounded lips. The third has bowls and jars with a ridge of carination forming sharp to rounded shoulders, above which walls incurve before expanding to direct rims having flattened or rounded lips (Evans & Meggers 1960:307–308). Kanuku Plain is distinguished from Rupununi Plain by the absence of a gray core. In addition to a few unclassified cariape-tempered sherds, a number of unclassified decorated sherds were noted. Techniques include incision, applique, punctate, white paint, white slip, and red film. The almost complete absence of decoration in the Rupununi Phase makes these finds particularly notable. Pottery artifacts included three fragments of a pottery rest, crude anthropomorphic figurine fragments, a coiled ceramic disk, nineteen shaft polishers made from both Kanuku and Rupununi Plain sherds and a cubical rubbing tool (Evans & Meggers 1960).

Plew & Peirera (2001) identified four Rupununi Phase (*sensu* Evans & Meggers 1960) sites in the Shiriri Mountain area. Though absolute dates are not available, Plew & Peirera (2001) follow the presumption of Evans & Meggers (1960) that the Rupununi Phase dates to the Late Prehistoric or Early Historic period. Their survey, though limited in scope, identified a greater degree of variation in settlement type. They recorded a workshop/manufacturing station, a rock alignment, red pictographic rock art and an unusual cemetery, which produced evidence of painted pottery. Evidence of manufacture of chipped stone tools is probably represented at sites previously described by Evans & Meggers (1960). At Site IX-2:77, however, a small lithic tool manufacturing area appears to be the first such station located away from a habitation site.

Discovery of a stone alignment near Lukobar Mountain broadens the range of ceremonial sites. Stone alignments are known throughout the area, having been reported by Evans et al. (1959) in eastern Venezuela and in Amapá, northeastern Brazil (Meggers & Evans 1957), the Sipaliwini and Parú savannahs of Surinam (Boomert 1975, 1977; Frikel 1961, 1969) and in granite outcrops atop the Mitaraka Massif in French Guiana (Hurault et al. 1956). In the Rupununi, a range of alignments have been recorded by Brown (1876), Farabee (1918), Henderson (1952), Roth (1929) and Williams (1979a).

Meggers & Evans (1957) note the similarity of structures from the Aruã Phase in Amapá, Brazil with those of Guyana. Suggesting movement into the mouth of the Amazon, they presumed that stone alignments were not of Rupununi Phase origin. In contrast, Boomert (1977:144–145) argues that stone alignments could have originated independently from similar socio-religious concepts. The most useful classification of regional alignments has been provided by Boomert (1981:144). He describes five categories of stone alignments including rows of spaced stones, circles of spaced stones, single standing stones known as "menhirs" piles of stones, stone figures, and walls of stone. The Lukobar Mountain alignment is a single row of spaced stones and stone figures. The single row of stones is comparable to those described by Brown (1876) east of the Ireng River and those reported by Williams (1979a) near Makatau Mountain south of Aishalton. Williams reported linear rows of spaced stones measuring 106 and 75 meters in length. The larger was 750 quartz cobbles and the smaller was 122 granite cobbles. The larger alignment situated on a small hillock to the east of Makatau Mountain ends in a short fork enclosed on its third side to form a triangle. The Lukobar alignment (48 meters) is smaller than those reported by Williams (1979a) but like the larger of the Makatau alignments is configured into circular and rectangular forms constituting part of the same alignment. The function of the alignments remains speculative though the locations and the material associations would seem to support the ceremonial/ritual function ascribed to them by Evans & Meggers (1960). Roth (1929) reports that the alignments served as a reminder of the numbers of individuals slain in battle, a report reiterated to us by Wapishana informants. Roth (1929) also observed that alignments may have served as "signs or signals on the road." Regardless of function, Rupununi Plain sherds recovered from the Lukobar locality indicate that stone alignments of the types

described by Boomert (1981) are associated with the Rupununi Phase.

Recent work also recorded an important cemetery on Shiriri Mountain. This indicates variability in mortuary practice. Evans & Meggers (1960) note the use of ledges and walls of granite boulders for placement of burial jars. They are typically few in number, occasionally isolated, and in some instances accompanied by large vessels of the Kanuku Plain type. They are inverted relative to burial jars and so serve as lids. Though the vessel types reported by Evans & Meggers (1960) are relatively similar to the range of vessels present at the Shiriri Mountain cemetery, Shiriri appears to represent a funerary context used many times over an extended period. The Shiriri cemetery consists of vessels with constricted necks but of variable sizes. There is no evidence of the use of open vessels to serve as lids. In contrast, small ceramic disks measuring 4–6 cm in diameter served as lids fastened or sealed over the lip of the vessel by small daubs of yellowish clay approximately 1–1.5 cm in diameter. While Evans & Meggers (1960:295) report that the only cremated remains from the Rupununi Phase were found in a single vessel from Tamiro-Wau cemetery, it appears that all vessels at Shiriri contained cremated remains. Hence, the Shiriri cemetery is distinct with respect to context, sealing of vessels and in the common practice of cremation, a form of disposal not practiced by the historic Wapishana. It appears that the remains had been exposed to high temperatures with only distal ends of upper and lower limb bones present. Several individuals are represented. One small vessel appears to contain the remains of an infant.

In addition, the face of the rockshelter is covered by red pictographs. These include a geometric configuration of connected rectangles and a series of dot and line patterns. The geometric motif is located just above the stone platform at the base of the shelter where the vessels were placed. Above the rectangles is a series of fine red lines in lateral groupings. To the east a group of lines and dots were found in variable configurations. Lines are often situated one above another. Four ceramic vessels were recovered from the cemetery. These include four small globular vessels. Surface and core color indicate that three of the vessels are of the Rupununi Plain type and one is a Kanuku Plain vessel.

The Shiriri cemetery is of still further interest because it is associated with pictographic rock art. This is of particular note since pictographic rock art has not been reported in the Rupununi and consists of motifs not common in petroglyphic panels of Aishalton (Williams 1979a) and of the Essequibo and Kassikaityu Rivers (Williams 1979b and 1985b). The exceptions are Brown's (1876) and Baldwin's (1846) passing references to painted figures. The Shiriri cemetery pictographs consist of red painted lines and dots which appear to be grouped together and also of a fairly large panel of connected diamond motifs just above the floor of the shelter. Diamond motifs of this type are not common in the area. Though Williams (1979a: 22–24) describes two small isolated motifs at Makatau Cave to the south, the motif is clearly insignificant in its presence in the Aishalton style. The presence of pictographic figures at the Shiriri cemetery is of note because it implies that red pictographic art may be associated with certain burial contexts in late horizons.

Of further significance is the possibility that the red painted vessel from Shiriri reflects additional aspects of Rupununi ritual. Williams (2004) has described a Classic period Mabaruma hands-to-face funerary motif similar to that recovered at Shiriri Mountain and common throughout portions of Amazonia. The figurine, which was recovered from Mon Repos, a Post Classic cemetery of the Abary phase and from Kumuku Hill in an Apostederan assemblage on the Demerara coast, is distinctive in the wavy locks motif placed on the back of the neck as a directional device in mortuary ritual (Williams 2004:301). The presence of the motif in the Rupununi suggests that a broad pattern of mortuary symbolism was shared by many peoples over a large area for an extended period.

In general, Plew & Pereira (2001) confirmed earlier observations by Evans & Meggers (1960) and Williams (1979a) regarding the distribution of cultural materials and site types. The survey suggests, however, greater variability in site types as indicated by the discovery of a lithic workshop station, the Lukobar Mountain stone alignment, and by the Shiriri Mountain cemetery. This suggests a more elaborate set of ritual and mortuary practices. Whereas recovery of red painted pottery, the description of pictographic rock art, and association of a stone alignment complex with the Rupununi Phase are of specific historical interest, much additional work is required before a complete understanding of the use of the south savannahs and of the Rupununi Phase is possible.

Although previous research shows the wealth and variability of archeological resources within the region of the south Savannahs, it is unclear whether patterns described by Evans & Meggers (1960), Williams (1979a) and Plew & Pereira (2001, 2002) are consistent throughout the area or whether a greater variability in of hunter-gatherers lifeways is to be found (see Williams 1985b).

Reconnaissance of areas along the western flank of the Kanuku Mountains in the vicinity of Moco-Moco village and the Sawariwau River near Imprenza recorded several archaeological sites (Plew, Mercer

and Sundell 2001). These include a lithic workshop/manufacturing station, groundstone features, burial localities and a probable 19th century village site containing Rupununi Plain pottery. The groundstone features include grinding/processing areas and sharpening grooves.

Four types of groundstone features were noted at two sites along the Sawariwau River near Imprenza. Type 1 features include shallow circular to oval basins measuring 15–30 cm in diameter while Type 2 includes elongated features having widths of 8–9 cm and lengths between 18 and 20 cm. Type 3 features consist of narrow elongates measuring ca. 20 cm in length, 3–4 cm in width and 2 cm in depth. Type 4 features include large shallow trough-like features set end-to-end and measuring 20 by 30 cm. Over sixty individual features were noted. Groundstone features have not been routinely described in the Rupununi, making the Sawariwau finds relatively unique. The presence of these features at differing depths in the river channel suggests a pattern similar to that descibed by Williams (1979a) in which fish petrogylphs were positioned to coincide with variable water levels.

East of Moco-Moco is what appears as an abandoned village site covering an area of 100 × 60 meters. Though no evidence was found of house floors or remnants, fragments of wattle and daub and brick were noted. Two archaeological features that were documented consisted of an apparent hearth and refuse dump and a possible stone-lined cooking feature, which includes the remains of a pottery vessel. The site contains historic bottle glass, metal fragments, and both plain and decorated porcelain of types similar to those described by Evans & Meggers (1960) and considered to date to the early 19th century. Most notably, twenty sherds of the type Rupununi Plain were recovered at the location. This supports Evans & Meggers's (1960) assertion that the Rupununi Phase extended into the Historic period.

In addition to recording a significant number of groundstone features and an important 19th century village site, the survey identified a burial locality unlike those previously described by Evans & Meggers (1960) and by Plew & Pereira (2001). Situated north of Moco-Moco are two large boulder shelters. Along the south edge of the more northern boulder is a cairn burial. The burial contains the remains of a robust male placed on a stone slab and covered by stones to a height of some seventy centimeters. Kanuku Plain pottery sherds are scattered about the burial area and the slope of the Rockshelter.

The findings of the west Kanuku survey reaffirm what is currently known of the prehistory of the Rupununi but suggests that the record is considerably more varied than previously known. Discovery of new site types will allow assessment of the greater variability of the Rupununi Phase identification, but evaluation and dating of additional habitation sites would permit a more compete understanding of the Rupununi Phase peoples in the early historic period.

Archaeological sites have also been identified in the vicinity of Shulinab and Mariwau Villages and near Inaja south of Lethem. The two sites near Inaja are typical ceramic scatters covering relatively small areas. They consist of a few scattered sherds. In both instances, the ceramics belong to the type Kanuku Plain. The sites appear to reflect short term uses of the area.

In the mountains east of Shulinab Village, the survey located a rock alignment complex. It consisted of stacked stones, cairns, and a rectangular feature resembling the range of features described by Evans & Meggers (1957) in the Amapá region of Brazil and the Parú savannahs of Suriname (Boomert 1975, 1977). The alignment, however, most closely resembles that described by Williams (1979a) at Makatau Mountain and by Plew & Pereira (2001) at Lukobar Mountain near Shiriri. Of still greater interest is the discovery of distinct cemetery locations on Skull Mountain near Shulinab and in the mountains east of Mariwau. The Skull Mountain cemetery is located in a rockshelter below the rock alignment/"war-bench," described above. The shelter rises some twenty meters above its floor and measures approximately 35 × 8 × 12 meters. Situated near the center of the rockshelter are nineteen ceramic vessels. The largest, which measures 70 cm in diameter, contains the remains of three males probably in their 20s at the time of death. A female mandible was situated under ceramic sherds near the back of the shelter. Vessels vary greatly in size and all but two are Kanuku Plain. The remaining vessels, which are quite large, are of the type Rupununi Plain. All are round-bottomed and do not appear to have been sealed. In this regard the ceramic vessels associated with the interments are similar to those associated with the cairn burial near Moco-Moco-Creek. The majority of vessels were open-mouthed but a few of the smaller ones possessed incurved necks. This is of note since many of the vessels at Shiriri were sealed with clay lids, though all were constricted-necked vessels. Of equal interest is the presence of pictographic rock art in the form of parallel smudges, lines, dissected circles, a U-shaped configuration and opposed rectangles. Notably, the Shiriri cemetery is the only other site that has pictographic representation in association with a burial context (Plew & Pereira 2001).

An additionally important discovery was made in mountains near Mariwau Village where burial urns were recessed into pits excavated into an open saddle some 200 meters above the savannah floor. Though

two of the features had been looted, the third remained intact. Two vessels of the type Kanuku Plain were superimposed and stabilized by stones placed around the base of the upper vessel. To date, this is the first recording of this type of burial in the Rupununi.

Recent work in the vicinity of Yupukari and Toka villages has also cast light on the nature of Rupununi occupations (Plew & Pereira 2002). In and around the village of Toka, pollisoirs similar to those at Imprenza on the Sauriwau River were noted as was a mountaintop village with cooking areas and a range of decorated and painted ceramics. In addition, a new type of cemetery characterized by earthen and stone mounds was recorded. So too were petroglyphs of the Enumerative style on Banuni Creek south of Toka (Plew & Pereira 2002).

The investigations reported here suggest a generally greater variability in site types than previously known (cf. Evans & Meggers 1960; Plew & Pereira 2001; Plew, Mercer and Sundell 2001). First, the results suggest that open ceramic scatters/sites may be expected to occur in locations other than adjacent to major water sources as is the case with the recently recorded mountaintop village near Toka. Secondly, there appears to be a common pattern of stone alignment construction in site areas locally known as "war-benches," and thirdly, pictographic rock art is associated with some burial localities but not all. The findings further suggest that burials are not gender-specific, that they are sometimes situated in open areas, and that they are again varied, as is demonstrated by the superimposition of burial urns at some sites. Though Evans & Meggers (1960) described vessels recessed into rockshelter floors, the discoveries at Mariwau appear to be the first in which vessels were placed in an open area.

Recent investigations within the North Rupununi area are important in interpreting the archaeology of the Iwokrama reserve. Since Amerindian peoples have utilized both areas, though variously over time, an understanding of the archaeology of the Rupununi is essential to delineating the parameters of prehistoric cultural uses of the forest. Conversely, the archaeology of Iwokrama should provide insights into uses of the north Rupununi area in earlier prehistoric times. Specifically, the relationship between the North Rupununi and Iwokrama Forest should provide insights into the methods and seasonality of resource use, the potential optimality of different resources and strategies, and the relative importance of hunting and gathering to horticulture as well as the seasonal versus annual importance of fishing to hunting and horticulture. In addition, examining the relationships between the areas should allow for a better understanding of tool stone acquisition and distribution, as well as of the manufacture of lithic and ceramic items and their distribution within the region. Also, further investigation should enhance our knowledge of the ritual and religious sites in the area.

## ARCHAEOLOGY OF IWOKRAMA FOREST

The archaeology of Iwokrama provides important data for interpreting forest adaptations in Guyana and the surrounding areas as well as the simultaneous use of the forest and savannah as part of a broader settlement regime. The following overview of Iwokrama archaeology is based on surveys and test excavations of Williams (1996) and Plew (2002).

Williams (1996) participated in two short exploratory surveys in May 1993. These served as the basis for his more formal survey of the Iwokrama Forest between 2–31 March, 1994. Relying upon work conducted by Meggers & Evans (1960) in the Pakaraimas and his work on the Mazaruni, Potaro, and Essequibo Rivers (Williams undated a-c.), he sought to predict the nature of archaeological sites and occupations within the reserve. His effort was maximized by conducting linear surveys of streams and rivers. Williams (1996) analyzed the data from these surveys within a cultural-historical framework that included consideration of the Paleo-Indian, Archaic, Horticultural, and the Historic Period. He also evaluated the nature of occupations of the Reserve with respect to the so-called "refuge theory" positing Holocene Period fluctuations in climate that reflect expanding and coalescing conditions of wetness and aridity. In particular, Williams (1978) contends that archaeological evidence from Seba on the coast and Quartz Island in the rain forest near the Mazaruni River documents these fluctuations. Williams (1979b, 1985a) further argues a fisheries management strategy identified the use of differing technologies and species at different seasons and locations along watercourses within the Reserve. Williams (1996) also argued for a relationship between forest peoples and those utilizing the savannah as part of a broader regional settlement. More recently, Plew (2002) has conducted surveys and test excavations in the Iwokrama Mountains and along the Essequibo River near the field station. These projects suggests some greater settlement variation than posited by Williams (1996).

### Paleo-Indian Period

The Paleo-Indian Period from 11,500 to 7,000 B.P., is not currently documented within the Reserve. Neither Williams (1996) nor Plew (2002) identify relevant materials or sites. If, as Williams (1985b) suggests, the economic pursuits of Paleo-

Indians are associated with a "Big-Game" orientation characteristic of more open parklands/savannah country, evidence within the Reserve may be limited. If there occurred extended periods of drought during late Pleistocene or Early Holocene, evidence may exist in some locations. The absence of data may also reflect the level of archaeological sampling within the reserve and in Guyana generally.

Since the 1950s, finds of Paleo-Indian triangular and triangular-stemmed points made of quartz crystal and other materials have become increasingly common. Noted early by Hurt (1960) at Lagoa Santa in Brazil the distribution of such points has recently been summarized by Meggers & Miller (2003). In Guyana, Williams (1985b) reports on a Paleo-like point from the Ireng River. Additionally, Plew (1997) identified three triangular quartz specimens in the Im Thurn collections (Cambridge University), one from near the Barima River, one from on the Ireng, and a third from the Essequibo. A fourth specimen, from the Mariwau area in the Rupununi, has been identified (Plew & Saras 2001).

## Archaic Period

The Archaic Period from 7,000 to 3500 y BP is characterized by a pattern of broad spectrum foraging associated with a wide range of archaeological site types. These include artificial groundstone depressions, chipping stations/manufacturing locations, petroglyphs, and isolated artifacts. Because the Archaic economic strategy reflects considerable use of the forest, a range of new "groundstone" tools including axes, adzes and other woodworking and plant processing tools first appear in the archaeological record. Some items are associated with the manufacture and use of artificial depressions (open basins) used for plant processing and for sharpening grooves.

Petroglyphs include stylistic elements characteristic of the Enumerative and Fish-Trap petroglyph styles that Williams (1985a) believes to be associated with different time periods, different cultural traditions and different subsistence strategies. Absent are design motifs characteristic of the Timehri pictographic style. The Enumerative style is considered the oldest and includes geometric, anthropomorphic and zoomorphic elements while the Fish-Trap style glyphs were "sign-posted" on rocks identifying different species and seasonal locations. The later style is thought by Williams (1985a) to be associated with periods of reduced precipitation during the late Holocene. Most notable is the reporting by Williams (1996) of what he describes as the first occurrence of the so-called Cuneiform glyph in Guyana. The glyph is a sub-variant of the Enumerative style and is found mainly on the Siparuni River. Specifically, it is an inscription technique in which a narrow "v"-shaped groove is cut into the stone in the manufacture of the glyph. As such it represents more the method of manufacture than a petroglyphic style. The Enumerative style, which is most commonly represented in the rock art of Iwokrama, is found on the Essequibo to Waraputa Falls, and on the Buro-Buro to Dakali Falls. The presence of the Fish-Trap style is known from an occurrence of the "spring-basket trap" glyph at Kurupukari on the Essequibo. As noted, glyphs of the Fish-Trap style are thought to be associated with different water levels, e.g., those at Inscription Rock on the Buro-Buro River. At Sharples, Williams's (1996) reports a unique and as yet unreported style described as including an "integrated lozenge."

Enumerative, Cuneiform and Fish-Trap styles of rock art reflect varying functions but it is unclear whether they represent different cultural traditions (ethnic populations) and/or different time periods in the Reserve. This is because most rock art remains undateable. Further, while Williams's (1985a) hypothesis regarding fisheries management has great interpretive value, it is not yet possible to distinguish between the placements of artificial depressions intended to ensure continued use at differing seasonal water levels on one hand from those during periods of extended Holocene drought on the other (see Table 1).

*Groundstone Features (Artificial Depressions and Sharpening Grooves).*—A notable category of archaeological sites within the Iwokrama Forest is groundstone features that occur in numerous locations along major rivers. The features include shallow basin depressions used for processing plants, most commonly those used for fish poisons, and steeply incised grooves believed to be used as sharpening grooves for axes, adzes, and other woodworking implements. The features which Williams (1985b) referred to as "pollisoirs" have not been systematically recorded in many areas. These occur in a variety of forms and often with shallow basin depressions.

Williams (1996) reported groundstone features on the Siparuni, Buro-Buro and Essequibo rivers. Of these, the most diverse and extensive occur on the Siparuni where six sites document 926 groundstone features. Features include both open dish-like depressions and "sharpening" grooves. Though features are noted at Electric Eel Rock (N = 34) Tapir Rock (34), Trinity Rock (3) and Pakatau Falls (3), 92% of all features occur at Big "S" Falls (see Fig. 2). Williams (1996) notes an approximately equal distribution of features by left (N = 414) and right (434) riverbanks and observes that sharpening grooves, which are not common, also exhibit a relatively equal distribution between riverbanks. On the Buro-Buro River, 37 depressions were noted of

Table 1. Iwokrama petroglyph sites.

| Sites | Drainage | Type/style |
|---|---|---|
| Kurupukari Landing | Essequibo | Enumerative |
| Kurupukari Falls | Essequibo | Enumerative/fishtrap |
| Sharples Island | Essequibo | Fishtrap/enumerative |
| Turtle Pond | Essequibo | Fishtrap |
| Cuneiform rock-4 | Essequibo | Cuneiform |
| Cuneiform rock-1 | Siparuni | Cuneiform |
| Cuneiform rock-2 | Siparuni | Cuneiform |
| Cuneiform rock-3 | Siparuni | Cuneiform |
| Black Rock | Burro Burro | Enumerative |
| Duckla Falls | Burro Burro | Enumerative |
| Monkey Falls | Burro Burro | Undetermined |
| Woodants Rock | Burro Burro | Fishtrap |
| Inscription Rock | Burro Burro | Enumerative |
| Horseshoe Island | Burro Burro | Fishtrap |
| Unnamed creek | Burro Burro | Undetermined |
| Iwokrama Mountain | Burro Burro | Enumerative |
| Mile Thirty-Eight Cre | Burro Burro | Undetermined |
| First rock | Takutu | Enumerative |
| Second rock | Takutu | Cuneiform |
| Third rock | Takutu | Cuneiform |

which 68% (N = 24) are at Monkey Falls. Notably, very few sharpening grooves were found. The number of depressions reported on the Essequibo River also varied greatly. At Kurupukari Falls, 25 were noted whereas 33 were observed at Sharples. The most extensive features occurred at Cuneiform Rock where 136 were noted but in general there were few sharpening grooves (see Table 2).

Williams (1996) does not develop a formal typology of groundstone depressions though he describes three types: circular to ovoid depressions, ellipsoids resulting from longitudinal grinding of preforms into specific tools/implements, and ellipsoids from sharpening the edges of cutting tools. He assumes that size grades in the latter reflect the use of different grooves to sharpen different types of tools. Plew et al. (2001) developed a typology of groundstone features based on findings on the Sauriwau River in the Rupununi. This seems to describe the range of variability in features within Iwokrama. Plew et al. (2001:9) describe four types of groundstone features based on form, size and spatial alignment of features. Type 1 features are shallow (1–2 cm) circular to oval basins between 15–30 cm in diameter. Type 2 are elongated features between 8 and 9 cm in width and 18–20 cm in length with average depths of 4 centimeters. Type 3 are narrow, elongated features averaging 20 cm in length, 3–4 cm in width and 2 cm in depth. Type 3 features often occur in rows whereas Type 4 includes large shallow trough-basin features set end-to-end in rows. The majority of the features recorded by Williams (1996) appear to fall within the range of variation of Type 1 and the few sharpening grooves reported fit Type 2 (Table 3).

*Lithic Chipping/Manufacturing Station.*—On the left bank of the Buro-Buro River at Inscription Rock is an area of extensive quartz outcroppings. Williams (1996) reports thousands of lithic flakes and artifacts there. These include two bifacially worked axes (12 × 6 × 3 cm and 9.5 × 10 × 3.5 cm) and two large plano-convex choppers notable in that very few lithic quarries and/or workshops have been recorded within the area.

*Iwokrama Mountains.*—Plew (2002) identified evidence of Archaic occupations/use of areas beyond the major rivers. This is important because it suggests that the Archaic settlement pattern is one in which prehistoric peoples visited and used areas/resources throughout the region. This contrasts with the pattern suggested by Williams (1996). Plew's (2002a) survey strategy was largely intuitive in using landscape features as the basis for *a priori* assignment of probability of site location. Specifically, the strategy involved gradual ascent of a mountain from a base camp established two miles east of the Georgetown-Lethem road along an unnamed stream, with descent along its western face. The survey identified landscape features including streams, seeps, boulders along streams, rock outcrops, stone piles and large rock boulders near summits as likely locations of archaeological sites. As in Williams (1996), identification of these features was based upon Meggers & Evans (1960), Williams (2004)

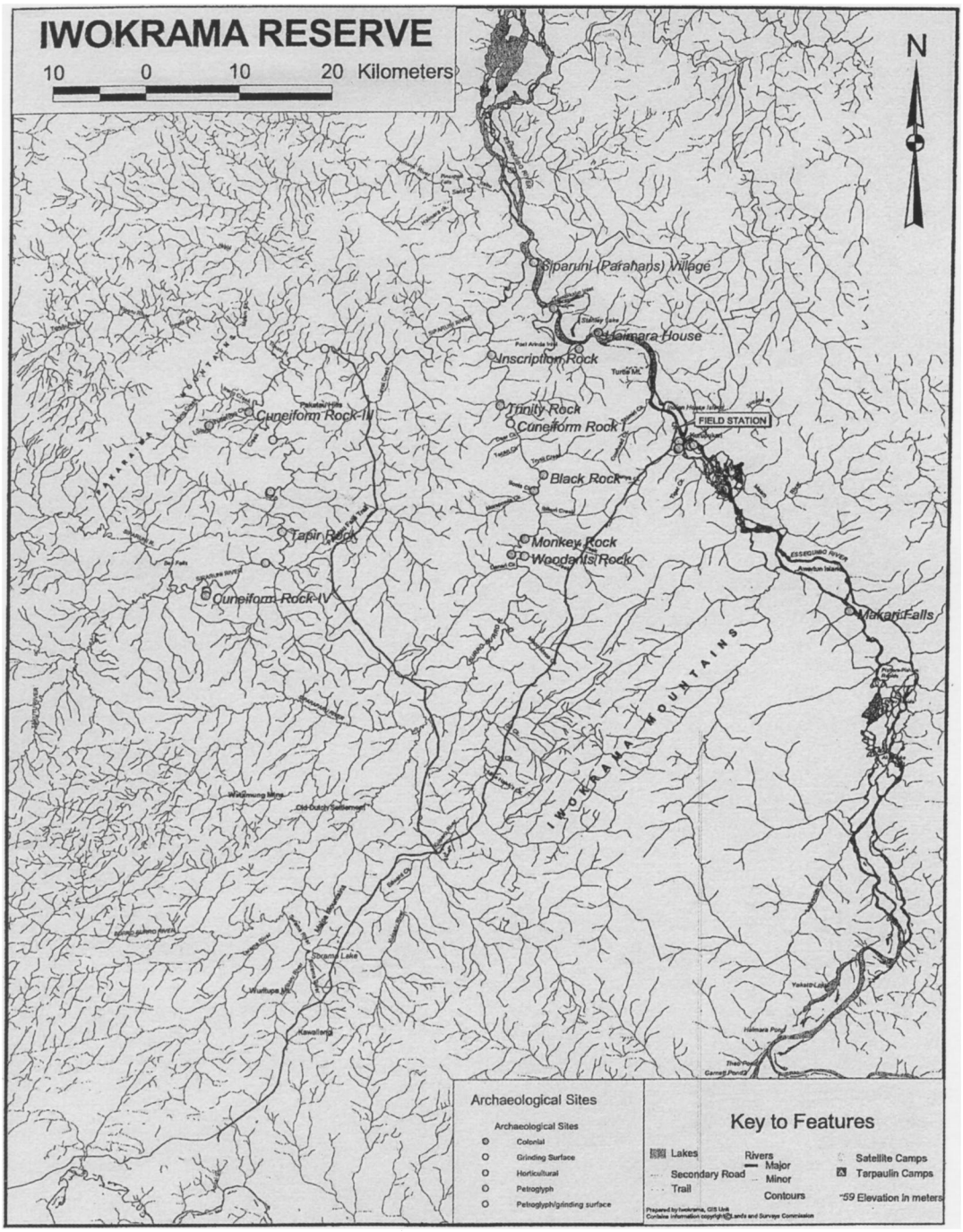


Fig. 2. Distribution of major archaeological sites/locations within Iwokrama.

and surveys in the Rupununi by Plew & Pereira (2001, Plew et al. (2001) and Plew & Saras (2001).

The survey identified two archaeological sites. They are petroglyph sites on secondary and tertiary stream courses. The petroglyphic elements generally resemble the Enumerative Petroglyph Tradition elements reported elsewhere in the Reserve. One site is located on a small intermittent stream no more than three meters across with many granite boulders. Like most of the area, the granite is covered by a dark magnesium oxide. Two generally bi-centric circles are depicted on a west-facing boulder measuring roughly one meter in diameter. The elements measure 40 x29 cm and 23 × 20 × 39 cm.

Table 2. Distribution of basin depressions and sharpening grooves by drainage and site.

| River | Sites | Basin depressions | Sharpening grooves |
|---|---|---|---|
| Essequibo | Reserve Base Camp | 4 | — |
| | Cuneiform rock | 136? | — |
| Siparuni | Cuneiform rock | 2 | — |
| | Electric Eel | 18 | 13 |
| | Tapir Rock | 33 | 1 |
| | Little "S" Falls | 12? | — |
| | Big "S" Falls | 853 | 129 |
| | Trinity Rock | 3 | — |
| | Pakatan | 3 | — |
| Burro Burro | Monkey Falls | 24 | — |
| | Black Rock | 22 | 2 |
| | Unnamed rock | 8 | 1 |
| | Dukali Falls | 3 | — |

The style is a broad-line deep gravure motif. The gravures are approximately 3 cm wide and 1–2 cm deep. The second set of elements was noted along a 15 m wide stream approximately one kilometer east of the first locality and 200 m north of the base camp. Its elements consist of straight lines, curvilinear elements and a completely pecked, heart-shaped design. One element appears to represent a serpent. The elements are on flat boulders along the stream course and are located along a rock face three meters in length, in what are essentially two panels. The larger covers about 50 × 30 cm. A single curvilinear motif measures 25 × 36 cm. The gravures are roughly 2–3 cm wide and 1–2 cm deep. In one instance, the edges of the boulders forming angles have been pecked to smooth surfaces. All motifs appeared above the present high water line.

The findings of the recent survey are significant because they indicate the presence of Amerindians in areas beyond the major rivers. Discovery of petroglyphs on secondary and tertiary streams importantly indicates that prehistoric Amerindians, who inhabited and utilized the major rivers, also made use of forest interiors. Also, it shows that these areas were not exclusively associated with subsistence. Of further significance is the identification of numerous locations on the mountain that could have served as short-term habitation sites and as cemetery or burial localities. The area inspected, though small relative to the total area of the Iwokrama Mountains, was characterized by rock outcrops and boulder shelters, which are known to have been utilized by Amerindians. Team informants reported areas within Iwokrama Forest very similar to locations around Toka to the south where recent discoveries of the pattern have been made (Plew & Pereira 2002). Also notable is the discovery of rock art in settings above present water levels. This raises questions regarding Williams's (1996) argument that desiccation of the forest occurred periodically during the Holocene.

## Horticultural Period

Between 3,500 B.P. and the Historic Period (early to mid-18th century) occupation in Iwokrama is documented by seven archaeological sites with pottery. Though pottery is known to date from earlier Archaic contexts in some areas of Amazonia (see Roosevelt 1998), its occurrence in Guyana has traditionally been associated with early horticulturalists (see, e.g., Williams 1985b, 1996). Sites dating from

Table 3. Big "S" Falls. Relationships of length to depth in 118 sharpening grooves.

| | Depth (mm) | | | | |
|---|---|---|---|---|---|
| Length (cm) | 0–10 | 11–20 | 21–30 | 31–40 | 41–50 |
| 0–10 cm | | — | — | — | — |
| 11–20 cm | | 5 | — | — | — |
| 21–30 cm | | 21 | 11 | 5 | — |
| 31–40 cm | | 18 | 8 | 3 | 1 |
| 41–50 cm | | 3 | 3 | 3 | — |

Table 4. Radiocarbon dates from Kurupukari and Makari falls.

| Site | Levels | Date | Laboratory |
|---|---|---|---|
| Kurupukari Falls (V111–2: 23) | 45–60 cm | 2080 ± 70 B.P. | Beta 76246 |
| | 60–80 cm | 2910 ± 80 B.P. | Beta 76247 |
| Makari Falls (V111–2: 32) | 20–40 cm | 90 ± 50 B.P. | Beta 76249 |

the Horticultural Period have been found on the Essequibo (n = 7) and Siparuni (1). Test excavations have been conducted at four locations on the Essequibo, near Kurupukari Falls at Errol's Landing and on Alexis Marcel's Island as well as at Makari Falls (Williams 1996) and at the Reserve Base Camp (Field Station) by Plew (2002).

*Essequibo River: Errol's Landing.*—Most notable and relevant to the Horticultural horizons in the Reserve are excavations conducted by Williams (1996) at Errol's Landing. Just above Kurupukari Falls on a river terrace some three meters above low water levels, Williams (1996) excavated a 2 × 2 m test unit to a depth of 80 cm. Excavated in 15 cm levels, the 0–15 cm interval consisted of *terre preta* soil with rootlets, charcoal, potsherds (n = 314) and lithic detritus. The 15–30 cm interval was similar but had more pebbles and less charcoal. Eight hundred and two pottery sherds were found throughout the interval. The 30–45 cm interval had a still greater density of pebbles but fewer of potsherds (n = 390). An area of intense burning yielded a charcoal sample. The 45–60 cm interval saw no change in soil type but an increase in pebble size and density. The density was such that the excavation unit was cut to a 1 × 2 m unit. The sherd count was 112. The 60–80 cm interval was excavated within a 1 × 1 m unit to accommodate the difficulty of excavating through large cobbles. Only nine sherds were recovered and the excavation curtailed at 80 cm due to the presence of large rocks.

Errol's Landing produced the most significant ceramic inventory from the Reserve as well as a stone tool assemblage. This included a whetstone 6.5 cm in diameter, a hammerstone ca. 7 cm in diameter, a scraper/knife between 6–8 cm made from a lithic flake, a chopper measuring ca. 8 cm in diameter, and a projectile point approximately 7 cm long made from a flake. Radiocarbon dates of 2080 ± 70 B.P. (Beta-76246 (Williams 1996) for the 45–60 cm level and of 2910 ± 80 B.P. (Beta-76247, Williams 1996) date the lower levels of the site to the early Horticultural Period (Table 4).

The Errol's Landing ceramic inventory consisted of 1627 sherds of which only 99 were decorated (Williams 1996). Pottery was manufactured using a coiling technique and temper that consisted of quartz sand, decomposed granite and caraipé. Unoxidized and oxidized sherds were found. Colors ranged from gray-black through tan to brick-orange. Tempering agents appeared to be associated with varying degrees of oxidation. Most granite-tempered specimens were fully oxidized. Core color varies, with pottery being relatively hard, well-smoothed and occasionally burnished (Williams 1996). Painted pottery is generally red-on-white. Incision was stained with red pigment. There were seven undecorated vessel forms that include open and carinated bowls and globular jars and bottles. Mouth diameters range between 12–40 cm with vessel wall thicknesses between 4–9 cm. Walls are vertical, incurring and out-sloping with direct rims and lips which are commonly tapered, beveled and thickened. In general, plain vessel forms resemble those of the Taruma Phase (Evans & Meggers 1960, see Figs. 1 and 2; Fig. 3).

Decorated ceramics from Errol's Landing include a range of vessel forms and decoration techniques. These include painting, modeling, incising, brushing, scraping, stamping and fingertip impressions. Ten types described by Williams (1996) include open bowls with direct rims painted red-on-white or incised on exterior surfaces; open bowls with a wide range of flanged rims in excess of 20 mm with incised motifs which include broad line "U" section incisions parallel to the rim and accented by spiral, circular and semi-circular motifs, open bowls with thickened rims measuring between 6–17 mm with interior and exterior incisions; bowls with incurvate walls, flat bases and zoomorphic lugs; flat-based small mouthed (up to 12 cm) pans with everted lobed rims decorated with a red wash and paired incisions including vertical semicircles bounded by incised horizontals; deep bowls/jars with vertical vessel walls and thickened rims having mouth diameters between 22–36 cm and wall thicknesses between 7–8 mm with "U"-sectioned incisions placed on rim surfaces as are fingertip impressions; deep bowls with curving to angular shoulders with everted rims and straight vessel walls with "U" sectioned incisions and paired semicircles are common as are bottles or jars with collared necks and flattened bases having mouth diameters of 6–12 cm, strap handles and punctated nubbins over a white slip applied to both interior and exterior surfaces and wall thicknesses averaging 6.5 mm; globular jars with walls

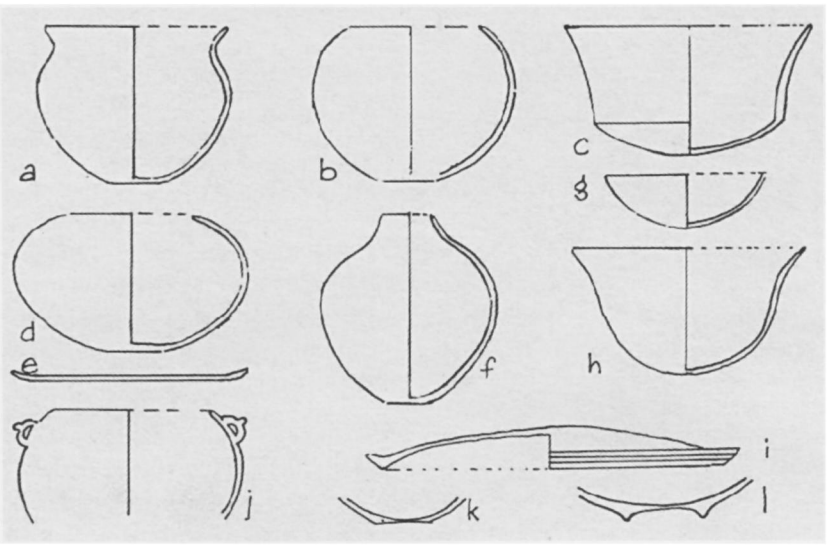


Fig. 3. a–l, Vessel forms from Kurupukari (from Williams 1996).

incurving to constricted mouths measuring 12–30 cm and having vessel wall thicknesses of between 9.5 and 5 mm with roller-stamped lattice of lozenge-shaped units; carinated bowls with direct rims and rounded lips and flanges decorated with "U"-sectioned concentric and three serially arranged vertical semicircles; carinated bowl with incurving upper walls, direct rim and rounded lip having a mouth diameter of 16 cm and wall thickness of 5 mm with "U"-shaped incisions on upper portion of vessel and paired semicircles bounded by horizontals top and bottom; and thin and punctuated surface decorated with flanged rim and mouth diameter of 40 cm. The lid is thin jar lid decorated with surface punctuations. In general types resemble those described by Evans & Meggers (1960, Table 5, see Fig. 4).

*Essequibo River: Alexis Marcel's Island.*—This area is immediately east of Sharples Island near Kurupukari Falls and produced 65 pottery sherds (Williams 1996). Excavation of a 2 × 2 m test unit using 20 cm arbitrary excavation levels produced an assemblage of both ceramics and stone tools. The 0–20 cm and 20–40 cm levels of white sand containing charcoal were interspersed with historic materials in the uppermost horizons. The 40–60 cm interval consisted of white sand that rapidly stained bright orange contained more clay and was increasingly more compact in the lowest levels of the unit. No cultural material was found in the interval. The unit floor was probed to a level of 80 cm below datum and produced no cultural materials (Williams 1996).

The material culture included stone tools and debris and pottery. One chipped and one ground stone axe were recovered as were lithic flakes of jasper, which occurs in the Pakaraimas. Undecorated vessels included open bowls with direct rims and tapered, rounded and thickened lips; deep bowls with vertical incurvate walls and direct rims with tapered, rounded or beveled lips; and carinated bowls with excurvate upper walls and direct rims with tapered, beveled or thickened lips. Vessels generally resemble those at Errol's Landing though none has a red

Table 5. Kurupukari Falls. Sherd frequencies/level (from Williams 1996).

| | Sherds/level | | | Decorated sherds | | | Decorated rims | |
|---|---|---|---|---|---|---|---|---|
| Level | Plain | Decorated | | Incised | Modeled | Painted | Flanged + incised | Painted |
| 0–15 cm | | | | 7 | — | — | 2 | — |
| 15–30 cm | 777 | 25 | 3.2% | 23 | 2 | — | 8 | — |
| 30–45 cm | 329 | 61 | 18.5% | 49 | 9 | 3 | 15 | 2 |
| 45–60 cm | 106 | 6 | 5.6% | 5 | 1 | — | 1 | — |
| 60–80 cm | 9 | — | — | | — | — | — | — |

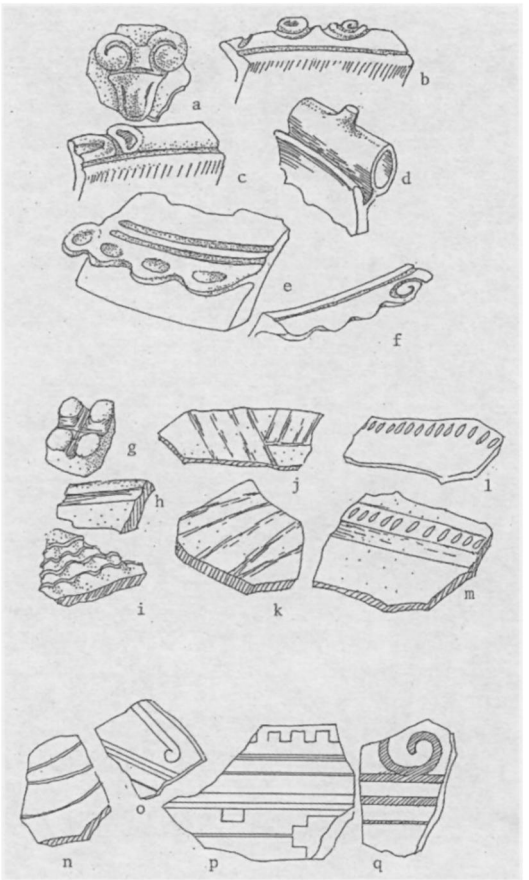


Fig. 4. a–f, Kurupukari incised and modeled; g–h grooving; i, fingernail ridged; j, scraped; k, brushed; k–m, serial finger tip impressions (after Williams 2004).

wash. Decorated ceramics include a globular jar with incurvate walls, constricted mouth and direct rim with rounded lip. Decoration includes the remnants of a red wash or slip and the latticework of lozenge-shaped units set above the shoulder of the vessel. The latter is 10–20 mm in maximum diameter (Williams 1996). Williams (1996) does not provide level totals for sherds recovered though it appears that the assemblage was not large.

*Essequibo River: Reserve Base Camp (Field Station).*—Williams (1996) recorded 30 sherds from a relatively restricted area south of the administrative/kitchen area and roughly 300 m south of the Essequibo River. Plain sherds in the collection are from carinated bowls with incurvate upper walls, direct rims and tapered, beveled or thickened lips. Temper consists of crushed decayed granite. The decorated sherds include one well-smoothed, red painted sherd and a second with "U"-sectioned incisions 8 mm wide. These circle the rim contour.

Plew (2002) found in the area three plain beige-orange sherds ca. 7 cm long and approximately 4 cm wide. They were smoothed and resembled the type Rupununi Plain. Two 1 × 1 m test units were excavated approximately three meters west of the field station boat dock. The units were aligned to magnetic north and excavated in 10 cm levels to an approximate depth of 25 cm below datum. The units were subsequently probed to a depth of ca. 40 cm. with no noticeable change in the nature of the deposit or densities of cultural material. The deposit consisted of white sand containing rootlets, some charcoal, and historic artifacts including wood, nails, glass and some metal fragments. Unit 3–4W/0–1N contained at the 10 cm interval two plain sherds resembling the type Rupununi Plain.

*Essequibo River: Makari Falls.*—Located approximately 3.5 m above high water level on a small mound directly behind the river bank at Makari Falls is a small area of *terre preta* (Williams 1996). Williams excavated a 2 × 2 m test pit to a depth of 20 cm. His excavation revealed an almost continuous bed of charcoal. Unfortunately, no artifactual materials were recovered. While Williams (1996) asserts that the site may have been used as a prehistoric fishing camp, it is unclear whether the site dates within the Horticultural Period since a single radiocarbon date was assessed at 90 ± 50 B.P. (Beta-76249, Williams 1996).

*Essequibo River: David Andries Landing.*—Williams (1996) collected 24 sherds eroding from the plaza area of a multi-household compound approximately 30 m above Kurupukari on the left bank of the Essequibo. The sample contained 15 cariapé-tempered and nine sand-tempered sherds. Sherds resemble plain types of the Koriabo and Rupununi Phases.

*Essequibo River: Martin's Island.*—Williams (1996) reports two small petaloid axes, a fragment of a large Dutch jar and two sand and cariapé sherds of an undescribed type all excavated on the right bank of the Essequibo opposite Kurupukari Landing.

*Essequibo River: Kurupukari Falls.*—A single unique ceramic vessel was recovered in a crevice within the Kurupukari Falls (Williams 1996). The sherds are from a large globular jar with collared neck and exteriorly thickened rim. The mouth of the vessel would have been approximately 32 cm wide and its wall thicknesses would have been 10 mm. Tempered with quartz sand, the specimen is unique among others recovered at Errol's Landing and Alexis Marcel's Island (Williams 1996).

*Siparuni River: Big "S" Falls.*—Williams (1996) excavated a habitation area immediately below Big S Falls on the right bank of the Siparuni River. A series of shovel probes and excavation of a 2 × 2 m test pit recovered 552 sherds from the 15 cm intervals. The 0–15 cm interval contained a dense

layer of humus above silty yellowish soil but no cultural material. The 15–30 cm interval had more compacted silty yellowish soil with charcoal fragments and pottery sherds. The 30–45 cm interval saw a gradual change in soil color from yellowish to pale orange with greater soil compaction and less cultural material. Lithic flakes were noted throughout the deposit.

Of the 552 sherds, only 46 were decorated (Williams 1996). Tempering agents for both decorated and undecorated ceramics included quartz sand, crushed decomposed granite, and caraipé. Most sherd cores are dark tan in color with a range of hardness. Decoration included a rare use of red and white slips, incision, stamping, fingernail impression, modeling and unerased coils. There was no evidence of painted designs.

Seven vessel shapes were recorded. These include open bowls with direct rims and tapered, rounded or beveled lips with mouth diameters of 12–40 cm and vessel wall thickness ranging between 4–8 mm; bowls or jars with incurvate walls and constricted mouths with direct rims and tapered, rounded or beveled lips; mouth diameters of 16–24 cm and wall thicknesses of between 3.5 and 6 mm; bowls with constricted necks and wide, flaring rims with rounded, tapered or beveled lips having mouth diameters extending to 36 cm and vessel wall thicknesses between 5–6.5 mm; globular jars with constricted necks and wide everted rims with rounded or tapered lips and mouth diameters extending to a maximum of 60 cm while vessel walls range between 6–16 mm; globular jar or bottle with vertical or slightly incurvate collared neck having mouth diameter of 6 cm; bowl with constricted mouth and exteriorly thickened rim with mouth diameter of 12 cm and a vessel wall thickness of 5 mm; and a colander having perforations measuring 20–25 mm in diameter and set 12–25 mm apart. The decorated ceramics from Big "S" Falls include four types that in form resemble undecorated varieties: open bowls with direct or thickened rims which are painted red-on-white; deep bowls with vertical to incurvate walls with overlapping unerased coils 6–8 mm wide; a carinated bowl with incurvate collar and flanged rim decorated with a stamped lattice of lozenge-shaped motifs measuring up to 20 mm in diameter; and a jar lid having unerased coils and "U"-sectioned elements below rim exteriors. In general, the types represented are similar in form, style, and decoration to Taruma, Koriabo and Rupununi phase materials (see Evans & Meggers 1960, Figs. 89, 95; Plew & Peirera 2002; Williams 1996, 2004).

## CONCLUSIONS

The record reviewed here is the basis for conclusions regarding the archaeology of Iwokrama and the North Rupununi. The questions addressed here relate to the chronology of these areas and the nature of their prehistoric settlement and subsistence. Though the archaeology of Iwokrama Forest is in its infancy, a number of significant sites have been identified within the Reserve (Fig. 2) that address these questions. The archaeological data indicate significant Archaic and Horticultural occupations (Table 6) documented by a twenty-nine sites that include habitation sites, manufacturing stations, groundstone features, and petroglyphs. While no evidence of Paleo-Indians has been identified, it is likely that such evidence will come to light given the appearance of Paleo-Indians elsewhere in Guyana and Amazonia(see Williams 1985a, Plew 1997). It seems likely that Paleo-Indians utilizing the North Rupununi would have intruded into the Iwokrama forest. This is of interest as Paleo-Indian artifacts have been reported elsewhere in Guyana

The Archaic Period from 7,000 to 3,500 B.P. suggests a pattern of broad spectrum foraging and a range of associated sites that are well documented within the Reserve. On the Essequibo, Archaic period sites include petroglyphs, sharpening grooves and a chipping station. In general, petroglyphs belong to the Enumerative and Fish Trap Petroglyph Traditions (Williams 1985a). The presence of the fish trap petroglyph is important since its distribution is known primarily from the rivers to the south. Its presence in Iwokrama suggests that the pattern may be more widespread and that the fisheries management strategy on the Kassikaityu River (Williams 1979b) was also in Iwokrama Forest. Though Williams (1985a, 1996) has argued that the use of fisheries glyph markers is associated with periods of Holocene desiccation, some may have been associated with seasonal water levels, which obviously will have varied. Notable, is Williams's (1996) documentation of the presence of the so-called Cuneiform glyph. As a sub-type (technique) of the Enumerative Tradition, this represents its first identification in Guyana.

The Archaic settlement of Iwokrama indicates occupation of different resources in various locations within the forest and along the rivers. The range of site types suggests that Archaic peoples were both processing local products and manufacturing stone tools. The latter is particularly interesting in that the extensive nature of the quartz deposits at Inscription Rock may indicate that Iwokrama was an important source of lithic raw materials.

Some Archaic sites in Iwokrama and the North Rupununi are noticeably similar to recently discovered sites at Petit Saut on the Middle Sinnamary River in French Guiana (Vacher, Jérémie and Briand 1998). In particular, there are marked similarities in the types of pollisoirs and what appear to be man-

Table 6. General chronology of Iwokrama sites.

| Period | Paleo-Indian | Archaic | Horticultural | Historic |
|---|---|---|---|---|
| Drainage Sites | | | | |
| Essequibo | — | Kurupukari Landing | Errol's Landing | Haimaru House |
| | — | Kurupukari Falls | Alexis Marcel's Island | Post Arinda |
| | — | Cuneiform Rock | Reserve Base Camp | — |
| | — | Turtle Pond | Makari Falls | — |
| | — | Sharples Island | Martin's Island | — |
| | — | | Kurupukari Falls | — |
| Siparuni | — | Pakatau Falls | — | — |
| | — | Electric Eel Rock | — | — |
| | — | Tapir Rock | — | — |
| | — | Big "S" Falls | — | — |
| | — | Little "S" Falls | — | — |
| | — | Trinity Rock | — | — |
| Burro Burro | — | Black Rock | — | — |
| | — | Unnamed rock | — | — |
| | — | Woodants Rocks | — | — |
| | — | Dukali Falls | — | — |
| | — | Inscription Rock | — | — |

ufacturing stations or workshop areas. The latter are particularly interesting because such sites have only recently been reported in the Rupununi (Plew & Pereira 2000). In general, the groundstone features resemble those described by Geijskes (1961:79–94) for the Coppename area in Surinam. This raises an important question about the age of such features. Radiocarbon dates from the Sinnamary River area in French Guiana range between 1660 and 220 B.P. suggesting that these features most probably occur in both the Archaic and later Horticultural Periods. The implication for Iwokrama and the North Rupununi is that sites described by Williams (1985b, 1996) as Archaic sites include the artifacts and feature inventories similar to the horticultural period. Hence, in some instances the mere absence of ceramics in what may be task-specific areas has resulted in their being described as Archaic.

The settlement pattern of the Archaic may be described as one in which sites were situated along major river courses and near falls and rock outcrops. The locations and sizes of sites suggest that foraging populations utilized the fisheries and forest resources. Exploitation of these resources was possible because stone tools had been made from locally acquired materials. The recent discovery of aboriginal sites along tertiary drainages (Plew 2002a) away from major rivers may indicate an intensive use of Iwokrama. Settlement in the Rupununi is characterized by sites along major waterways and near the forest.

The Horticultural Period, dating between 3,500 B.P. and the Historic period, is documented by eight horticultural sites located along banks of the Essequibo and Siparuni Rivers. Excavations at sites on the Essequibo River, particularly those from Errol's Landing, documented a wide range of ceramic bowl and globular forms including carinated vessels. Though the majority of ceramics from Horticultural occupations in the Reserve are undecorated (>90%), decorated wares do include the use of red-on-white painting, incisions, punctation (noding), brushing, stamping, modeling, and fingernail incisions. Most ceramic types are similar to Koriabo, Taruma and Rupununi types with undecorated (utilitarian) wares significantly more common.

Notably, test excavations at Errol's Landing indicate a human presence in the reserve at about 3000 B.P., if not earlier. The recovery of early Polychrome Horizon Style ceramics may prove significant in understanding the origins and distribution of this ware in Guyana and the region. This establishes at the moment a greater antiquity for settlements in Iwokrama than in the surrounding areas, and as with Kurupukari Falls suggests a degree of permanency of occupation associated with fisheries and horticultural activities.

Recent discoveries near Toka Village indicate that

similar wares were produced locally or traded between Iwokrama and the North Rupununi. The settlement pattern in Iwokrama is one in which Horticultural villages/encampments were located on larger river terraces and near falls and estuaries. It suggests continued emphasis on fishing during the Horticultural Period. In the Rupununi some settlements were located on hilltops overlooking the savannah. Within the forest areas, caves and rockshelters appear to have commonly served as burial locations and for other ritual purposes.

It appears that neither Iwokrama nor the North Rupununi saw significant Paleo-Indian occupation. In contrast, considerable evidence indicates extensive use of the savannah and adjacent rain forest during the Archaic and Horticultural periods. During these periods there is considerable similarity in the material culture and range of sites. An important issue is the degree of variability in local versus regional adaptations. The present level of archaeological investigations do not allow for observations regarding the influence of environmental change upon shifting procurement strategies of prehistoric peoples in the area.

At present, the absence of dated stratigraphic contexts prevents adequate delineation of more precise relationships between the settlement-subsistence strategies of Iwokrama and those of the North Rupununi. Future investigations should more widely identify the distribution and range of site types within the areas. They should conduct excavations that develop more detailed chronologies and allow for the description of a regional settlement regime. Future work should identify archaeological features within sites and develop paleo-environmental data for purposes of assessing long-term variations in procurement strategies. More detailed archaeological research should provide important insights regarding the regional human ecology of the Iwokrama forest and adjacent savannah as well as of other areas throughout the Guianas.

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