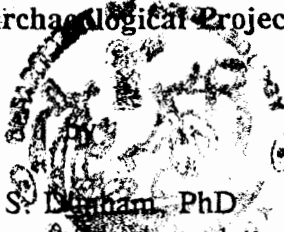


Field Report of the 1995 Season of the
Maya Mountains Archaeological Project (MMAP)



Peter S. Lehman, PhD
Department of Anthropology
Cleveland State University

Robert C. Murray, PhD
Department of Biology
Heidelberg College

William E. Brooks, PhD
Central Mineral Resources
United States Geological Survey

Robert P. Reynolds, PhD
United States National Museum of Natural History
The Smithsonian Institution

Theresa H. Cookro, MSc
Central Mineral Resources
United States Geological Survey

Jeremy F. Jacobs, MSc
United States National Museum of Natural History
The Smithsonian Institution

for

The Department of Archaeology
Forest Department
Office of Geology and Petroleum
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Introduction

The Maya Mountains Archaeological Project (MMAAP) is an ongoing multidisciplinary survey of ancient Maya ruins and associated mineral and biological resources in the Maya Mountains of south-central Belize. The main goal of the MMAAP is to further illuminate the nature of prehistoric Maya resource exploitation and exchange. In the process, we are shedding important new light on regionally unique and unusual sites, minerals, and biota.

The MMAAP has conducted three prior seasons of field work in the study area. Previous operations concentrated on the middle Swasey, Trio, Bladen, Snake Creek, and Esperanza/Central (upper Rio Grande) drainages. 1995 efforts focused on the Cockscomb Basin, including the upper Swasey and South Stann Creek watersheds. Follow-up work addressing matters left over from earlier seasons was also performed in the Snake Creek, Esperanza/Central, and upper Bladen pockets. The results of these investigations are summarized here for the purpose of providing an initial account of our findings. More involved reports will follow.

Archaeological Operations and Findings

As in preceding seasons, the primary thrust of the archaeological reconnaissance was to locate, map, and otherwise document sites that may have been involved in resource extraction, processing, and exchange in the Maya Mountains. At the same time, we sought to locate, record, and recover any other archaeological remains that might have been at risk from looters or from natural threats. Chief among such materials, generally, are objects in caves or open tombs. Moreover, we endeavored to evaluate the various finds for additional scientific, educational, and tourist potential and assess their possible needs in terms of protection. Archaeological operations were conducted in all study locales.

Four surface sites of substantial size and complexity were located and mapped. Three were in the Cockscomb Basin, the world's only jaguar sanctuary. One was in the Bladen Reserve, the other major protected area in southern Belize. A fifth site, Bats'ub, was briefly visited closeby the confluence of the Cacao and Pull Shoes Branches of the Sittee River, on the edge of the Sittee River Forest Reserve. With large architecture and several monuments, one of which may have once been carved, it may eventually prove to be a prominent center.

In the eastern drainage of the Cockscomb, the South Stann Creek, we rediscovered the Pearce Ruin. Originally reported by the British Museum (Joyce 1931) in 1931, it was never successfully relocated, despite subsequent efforts (Graham 1983), until now. We found it near the juncture of the main tributaries, the most logical point of access and control for the surrounding area. About the size of Lubaantun, it ranks among the two largest sites known in southern Belize. It has some of the tallest structures in the region, a ball court, and four major courtyards. The main plaza is truly enormous, larger than a football field. Sitting atop a bluff, the site towers over a half dozen reservoirs, borrow pits from which fill was extracted for its construction. It has a number of other interesting features, such as ten plain granite monuments, one of which is a unique massive, egg-shaped monolith. There is also a rare monument workshop that includes a very unusual stone shaft carved in the form of an extended serpent.

A smaller yet still sizable center was encountered up the Sittee Branch of the South Stann Creek (not to be confused with the adjacent Sittee River of the Bats'ub ruin). Joyce mentioned such a site in 1931. It is close to Kuchil Balum, a minor center described by Rabinowitz (1987).

The two sites might be the same, however, the sketch map and description of Kuchil Balum in the Belizean Department of Archaeology's files (Gundy and McNatt 1984) do not at all fit what we saw at our site. Kuchil Balum consists of a terraced hillside with two mounds and a circular altar stone on top plus two mounds and a pair of oval monuments at the base. We uncovered a large plaza with several plain granite monument slabs at one end, a substantial range structure to the side, and a building almost as large as those at the Pearce Ruin and a borrow pit/reservoir on the other end. In light of these differences, we named our site separately, although it may eventually prove to be part of a larger settlement that encompasses Kuchil Balum. We called it *Huntul Mo'*, Mopan Maya for "One Macaw," after a solitary scarlet macaw that we sighted there and in the tradition of ancient Maya names.

Another smaller but noteworthy center with a large plaza, three plain granite monuments, a single massive structure, and its own ball court was found at the junction of the major feeder creeks in the western portion of the Cockscomb, the upper Swasey. We named it *Xa'ayilha*, Maya for "Many Waters," in honor of its commanding riverine location. Numerous lesser sites of considerable size and complexity were observed scattered throughout the valley.

A fourth center--*Muklebal Tzul*, K'ekchi Maya for "Place of Many Tombs"--was uncovered in an extremely remote and rugged canyon in the Bladen headwaters. With four major plaza groups and numerous extremely well-built and elaborate constructions, it is honeycombed by tombs. One tomb has a corbelled vault ceiling. Two others are part of a complex with a door, shaft, and passages. A large hydraulic complex with massive terraces, *Sahonak' Tasar*, was found approximately 2.2 kms. to the southwest, at the origin of the Bladen proper. It probably served as an agricultural support facility. While common in the north, such architectural features and terracing are scarce in the southern Maya Mountains.

Surface remains at all the sites appear consistent with a Late or Terminal Classic date (AD 700-900). By virtue of its size, complexity, monuments, and location, the Pearce Ruin was likely the chief center in the eastern Cockscomb at that time. It probably controlled resource movement in and out of the upper South Stann Creek watershed. Lesser centers like *Huntul Mo'* presumably commanded extraction or processing in the headwaters. They may have been direct satellites or simply under the domination of the Pearce Ruin. *Xa'ayilha* would have been in an analogous position of advantage over the upper Swasey. *Muklebal* was clearly the premier site and undoubtedly managed resource operations in the uppermost canyon on the Bladen, possibly under the command of other centers that controlled access along the Bladen.

With respect to the recovery of materials at risk, three open tombs were partially excavated at *Muklebal*, in an effort to minimize the likelihood that they might ultimately be looted. All remains were highly fragmentary, due to weathering and collapse.

In addition, there were numerous cave finds of note. From a cave reported by Raleigh International and Forestry near Union Camp, we removed a wooden stool, six ceramic vessels including an Early Classic polychrome bowl (ca. AD 500?), remnants of incense, a probable corn cob, a mass of cacao (chocolate), and human remains that may still contain tissue suitable for DNA testing. We also retrieved a large bench, possibly carved from a single piece of solid mahogany, a wooden torch, and several wooden shafts from a cave on the upper Bladen. The dating of the organic materials is unclear, pending further study. A number of other finds were made in caves, and we collected a series of soil samples for hydrological (water management) and palynological (pollen) study in the K'antulai and Cumbre sink holes on the upper Rio Grande. Some of these materials are being exported temporarily for preservation and analysis,

which will be performed primarily at Cleveland State University and the Smithsonian. Detailed descriptions and interpretations will follow in forthcoming reports.

Regarding the condition of the sites, all had already been looted in recent years, except Muklebal. Most of the damage was minor, although entire buildings have been destroyed at the Pearce Ruin, Xa'ayilha, and Bats'ub, particularly the latter. Hunters and fishermen regularly pass by these sites, approaching from the South Stann Creek and Juan Branch, Lagarto pocket, and Kendal, respectively. The same routes are undoubtedly used by looters, who in many cases are probably also poaching. On the other hand, Huntul Mo' was not badly damaged, and Muklebal had not been looted at all. It offers an extraordinary opportunity to study a fascinating site in its native state, undisturbed at this point by human intrusion.

As for the protection of the sites, serious conservation measures have already been taken or could easily be undertaken. Obviously, it would help to control access routes to the sites. Huntul Mo' and the Pearce Ruin have educational and tourist potential. Visually appealing, they are situated near the Victoria Peak trail and could be readily patrolled by rangers and visited by trekkers. Opening them to the public would add a major archaeological attraction to the tremendous ecological and scenic allure of the Cockscomb, enhancing revenues and preservation prospects. Both sites are currently cleared of bush and have access trails. We also cut a trail from the Pearce Ruin to Xa'ayilha. It will provide wardens with access to the site and perhaps someday serve as a hiking route between the visitors center and a second park entrance projected for the Swasey drainage. At that time, Xa'ayilha could be opened. Finally, we cleared a helicopter landing site next to Muklebal and arranged for periodic visits by the British Army. British Forces are also contemplating jungle training operations in the vicinity of Bats'ub.

Based on the information gathered this year and in previous survey seasons, we hope to launch more intensive archaeological studies of resource exploitation and exchange in the Maya Mountains in the near future. We intend to return to sites with surface remains of resource processing to investigate the organization of production through the excavation of workshop areas. Much prior work emphasizes the importance of intensive, centralized manufacturing in complex development. We expect to examine the place of extensive, decentralized production. We will also document the structure and development of the exploitation and exchange system by excavating at extraction, processing, and distribution centers.

Geological Operations and Findings

The principal objective of the geological reconnaissance was to identify mineral materials of resource value to the ancient Maya, sample these materials to verify their identifications, and locate sources for them. We also looked for evidence of quarrying and processing, but the likelihood of finding such remains is low during an initial exploratory survey. At the same time, we endeavored to determine the sources of construction stones at the ruins, and we attempted to gather basic data on the general geology of the study area, including its geochemistry, geochronology, and geomorphology. Lastly, we remained alert for materials that might be of modern resource interest. Operations were conducted in all locations, except the upper Swasey, where a few mineral samples were collected during the archaeological reconnaissance.

A variety of likely mineral resource materials was documented. A ferricrete horizon and clasts occur sporadically along the drainages of the Cockscomb and present a primary source of iron oxides (hematite) for use as pigments. What initially looked like cinnabar among the

construction stones at Xa'ayilha turned out to be a particularly brilliant form of hematite that would have been especially well suited for the brighter reds. Granites at that site appear to match those in grinding stones there. Granites around the Pearce Ruin and Huntul Mo' may have been similarly utilized. Grinding stones at Muklebal consist of a Fe-cemented coarse clastic sandstone, which was not observed locally but may occur in stream cobbles or may have been obtained through exchange. Phyllite found at or above the confluence of the Central River and Jalisco Creek may have supplied soft carving stone. It may also have furnished cm-sized pyrite cubes for mirrors or dental inlays. The Bladen volcanics may have once contained obsidian, but given their age it would probably have devitrified (weathered) beyond utility by now. In any case, it was probably never exploited; the vast majority of Maya obsidian artifacts can already be traced to other sources. Silicified and unsilicified volcanic ashes were encountered. They may have been used in ceramic tempers, along with micaceous materials from the weathering of the Cockscomb granites. Mica is apparent in sherds from that area.

No evidence of associated extraction or processing was uncovered this year. Such remains would be exceedingly rare, however, and easily concealed by erosion and the forest. Furthermore, most materials could have been readily exploited by opportunistic means, specifically the gathering of float (cobbles) in the water courses. The only traces of the working of mineral materials occur in the monument workshop at Pearce Ruin, where a large deposit of what appears to be broken monuments, finished blanks, and waste pieces was found.

As for construction materials, the Triassic Cockscomb granite is the source of over 90% of the building and monument stones at the Pearce and Huntul Mo' sites. Two-to-three cm euhedral alkali feldspar megacrysts give the granite, in outcrop and mt-sized boulder float, a distinctive texture. Building stones at both sites have this distinctive porphyritic texture. Jointing in the deposits observed during the stream traverses combined with normal sheet-like exfoliation produce essentially prefabricated blocks and slabs for building use. Such an exposure lays immediately adjacent to the monument workshop at the Pearce Ruin. Cretaceous limestone is the source of the majority of building stones at many of the other ruins in the area, particularly at Muklebal, where the rock is similar bedded and forms convenient slabs and blocks. Rounded river stones, limestone and otherwise, constitute the major portion of construction materials at Ek Xux.

Information was also gathered on the general geology of the region. Rock samples were obtained in the Cockscomb for geochronological and geochemical analyses. Geochronological samples from the Bladen may allow us to refine dating of the Bladen volcanics in relation to the Cockscomb granites, clarifying whether or not the Cockscomb materials served as the igneous body that gave rise to the Bladen deposit. The existing dates are sufficiently close to raise the question and warrant scrutiny. The youngest Bladen date is 242 million years ago, and the oldest Cockscomb date is 234 million years ago (Bateson and Hall 1977), a difference of only 8 million years, possibly an artifact of differential cooling. The absence of widespread igneous rocks in Esperanza and Snake Creek precluded geochronological sampling in those locations. Nevertheless, they proved to be of interest for geomorphological reasons. They are cleft by an extensive fault. The fault continues to the west and is 'lost in alluvial material and low topography, but we have traced the contact for dozens of kms. to the northeast into the Bladen.

The faulting and associated conditions have implications for modern mineral resource potential. The presence of quartz veins and silicic dike material with sulfides that cut the Paleozoic(?) steeply-dipping phyllite suggest the possibility of precious-metal mineralization. This interpretation is based upon a mineral deposit model for low-sulfide Au-quartz veins

(Berger 1986), although these types of deposits are more common in regionally metamorphosed volcanic rocks, unlike those of the Maya Mountains. Offset of the horizontal Cretaceous limestone (down) against the dipping phyllite (upthrown) points to the post-Cretaceous faulting alluded to above that in combination with the hydrothermal alteration indicated by the pyrite would be consistent with such mineralization. In sum, the Esperanza-Snake Creek area may contain gold and may merit more intensive examination.

The geological reconnaissance has identified a number of mineral materials of resource value to the ancient Maya and located several promising sources. We hope to return to these locations in the future to sample them more heavily for compositional analyses. Such studies will help us to establish that Maya Mountains mineral materials were, indeed, exploited. They will enable us to compare source chemistry with that of artifacts made from the same materials. We will be able to identify artifacts made from Maya Mountains materials and retrace the exchange networks responsible for their circulation. We also wish to explore further the possibility that the red material sampled at Xa'ayilha may be cinnabar, a material of great significance to the Maya but little-documented to date by geologists in the wider area. The 1995 mineral collections will be stored and analyzed at the US Geological Survey in Denver, CO.

Biological Operations and Findings

Biological observations and collections were made at all of the study locales, save the Bladen headwaters and the upper Swasey. Operations were also conducted at our base camp in Big Falls, Toledo. Efforts were focused on fish, macroinvertebrates, herpetofauna, and small mammals, a new addition to our target list. A botanical inventory was not conducted, although a single fruit that was unknown to our guides, many of whom work in the logging industry, was noted on the Bladen. Water quality studies were also performed, mainly in the upper Stann Creek drainage. The purpose of the biological studies was to assess the biotic resource potential of the region vis-a-vis the ancient Maya, to further document the biological richness of this extraordinary biotic province, and to aid in evaluating its present status and viability. Most of the work was done in the late dry season, when conditions generally do not favor studies of terrestrial fauna, hence the true range of biodiversity is probably underrepresented.

247 fish were collected, representing 10 species, all of which we have previously documented elsewhere in the Maya Mountains. In general, we expanded documentation of their distributions and gathered additional specimens to strengthen our characterizations of their variability. In particular, we obtained further specimens of the spotted varieties first collected last year in Esperanza and Snake Creek among the green swordtails and shortfin mollies (*Xiphophorus helleri* and *Poecilia mexicana*). We also found a few spotted fish in the Cockscomb. We hope to establish categorically the nature of this spotting. Present evidence argues for unusual chromatic variation and not the melanoma that was originally thought to be a possibility. There may also be a few specimens in our collection of variants that we have not collected before and that we will only recognize upon closer laboratory inspection.

Several thousand macroinvertebrates were collected in Esperanza and Snake Creek, at the Pearce Ruin, and on the Bladen, near Teakettle Camp. A wide range of orders was documented, among them: dragonflies and damselflies, mayflies, caddisflies, and beetles (*Odonata*, *Ephemeroptera*, *Trichoptera*, and *Coleoptera*). As these are believed to be the first

reclassified upon final analysis and may include new species (in fact, initial lab studies have identified at least four new species of beetles).

Twenty-one water samples were also collected for phycological study (algae). Measurements were made for dissolved oxygen, temperature, pH, and conductivity. These figures will help elucidate the habitat conditions associated with the above aquatic animals.

As for herpetofauna, we collected a total of 129 amphibians and reptiles of 27 species near the Pearce Ruin, with 11 species of frogs, 1 salamander, 10 lizards, 4 snakes, and 1 turtle. Most conspicuous were the diurnal lizards (*Ameiva*, *Anolis*, *Basiliscus*, and *Sphenomorphus*) and frogs of the genera *Bufo* and *Smilisca*. A total of 57 amphibians and reptiles of 16 species were collected over a much shorter period at Teakettle Camp on the Bladen. They represent 5 species of frogs, 8 lizards, and 3 snakes. Again, the most conspicuous species were diurnal lizards, with *Corytophanes* instead of *Sphenomorphus*, and frogs of the genera *Bufo* and *Rana*, *Smilisca* being inactive here due undoubtedly to the extremely dry conditions that prevailed during our visit. An eyelash viper (*Bothriechis schlegelii*) was collected in Snake Creek. We believe that it constitutes the first record for Toledo. Previous specimens were found only in Cayo and western Orange Walk. The reptile and amphibian work was greatly expanded this year.

At the same time, we launched our first-ever studies of small mammals. A total of 94 specimens (25 species) were collected near the Pearce Ruin, including 2 species of marsupials, 4 rodents, and 19 bats. Larger species, such as peccary (both white-lipped and collared), kinkajou, tamandua, opossum, and both the variegated and Deppe's squirrel, were seen but not collected. Signs of tapir, jaguar, and armadillo were also noted. 50 mammals (16 species) were collected from Teakettle Camp. Bats and one anteater were the only mammals collected at this locality. Other mammals seen there were coati, spider monkey, four-eyed opossum, water opossum, and Deppe's squirrel.

In addition, continued efforts were made to study the spider monkey groups identified in 1994 in the Teakettle Camp area on the Bladen. The work was truncated prematurely, however, when Jeremy F. Dahl of Yerkes Regional Primate Research Center (Emory University), the principal investigator, had to return home shortly after starting because of an unfortunate family emergency. Hopefully, these investigations will resume in the future. We also note that Sharon Matola, the Director of the Belize Zoo, rejoined the field crew in the Cockscomb, facilitating the biological survey in the vicinity of Huntul Mo'.

Regarding the viability of the areas visited, for the most part they appear to be in good condition, with a few exceptions. The tremendous diversity of the macroinvertebrates, especially, likely reflects elevated water quality. It suggests that the associated ecosystems are relatively intact. Nevertheless, hunting and fishing on the Bladen, particularly in its upper reaches, have intensified enormously since we initiated our work there two years ago. Much of the traffic is coming through the hills from Golden Stream. Likewise, hunting and fishing are problematic in parts of the Cockscomb. In the eastern portion of the basin, poachers from South Stann Creek village and San Roman ascend the South Stann Creek and the Juan Branch, skirting south of the visitors center. In the western half, they come from Maya Mopan and Red Bank and gain access along the Swasey through the Lagarto pocket. Hunting and fishing in this sector are surprisingly heavy, considering its remoteness.

To minimize these impacts, we support the following recommendations, some of which are already underway. Installing a gate at Forest Hill would help control entry to the lower Bladen. Arranging for a squad of wardens to patrol the rest of the Bladen would clearly aid in managing the upper Bladen. Given their enthusiasm for the bush in general and this region in

particular, we think that such rangers should be recruited from the ranks of interested local Maya (K'ekchi or Mopan). We believe that opening the Pearce Ruin and Huntul Mo' for tourism, as suggested earlier, would also reduce poaching in those areas. Moreover, the projected addition of a second park entrance to the Swasey side of the Cockscomb would discourage illegal hunting and fishing there. We hope that the trail we cut between the Pearce Ruin and Xa'ayilha will facilitate patrolling the most remote areas. Formulation of an integrated management plan would certainly assist on all fronts.

We add that the herpetological and mammalian specimens will be curated at the US National Museum of Natural History (Smithsonian), where along with prior MMAP contributions they comprise the first such collections from the MMAP study area. The fish will be forwarded to James Thomerson of Southern Illinois University, a leading authority on the ichthyology of Central America and specifically Belize. Macroinvertebrate and phycological specimens will be examined and stored at Heidelberg College and the Smithsonian.

On the basis of data gathered in this and preceding survey seasons, we hope to return to the most diverse, developed, and unique biotic settings, the ones with the greatest and most distinctive resource potential, and study the biological resource base in more depth. Rather than conducting a gross biotic inventory, we will focus on the most promising localities and try to get a more detailed sense of what they have to offer. As part of this effort, we also expect to initiate an intensive botanical survey.

Conclusion

The 1995 season of the Maya Mountains Archaeological Project (MMAP) was highly successful. Four additional surface sites were found and mapped. A fifth site was visited briefly but not mapped. Numerous and impressive cave finds were made, including a wooden stool, a wooden bench, a polychrome bowl, and actual cacao beans. Two of the sites in the Cockscomb have serious development prospects. Aside from some spectacular hematites for red pigments, it seems probable that the Cockscomb granites were exploited for grinding stones, at least for local consumption. A variety of faunal materials were collected. Their continued analysis may reveal further information about the diversity and nature of biotic resources in the Maya Mountains and any unique or unusual biological resource possibilities that exist there.

The finding of additional surface sites and further resources in the southern Maya Mountains once more belies earlier impressions in archaeological circles that the region was little-inhabited and of minimal significance during Maya times, as it is now. The Maya Mountains were heavily occupied, and they likely played a major role in the Maya economy as a source of unusual and basic resources. Their central location suggests that much of this exchange was of a relatively short-range and internal character, in contrast to the exotic long-distance trade that dominates much previous thinking on the subject. Maya Mountains sites may reveal a great deal about the organization of production. They may have had a hand in the events behind the rise and fall of complexity among the Maya and may, therefore, reflect on the processes behind the emergence and decline of early civilizations in general. We hope to expand and intensify our studies in the future in an effort to clarify their broader importance.

Fish Collected in the Maya Mountains by the 1995 MMAP

<u>Genus/species</u>	<u>Common Name</u>	<u>Number of Specimens</u>
<i>Xiphophorus helleri</i>	Green Swordtail	104
<i>Heterandria bimaculata</i>	Pseudohelleri	24
<i>Poecilia mexicana</i>	Shortfin Molly	36
<i>Astyanax fasciatus</i>	Banded Tetra	46
<i>Cichlasoma urophthalmus</i>	Cichlid	11
<i>Belonesox belizanus</i>	none	1
<i>Gambusia luma</i>	none	4
<i>Brycon guatemalensis</i>	Machaca	10
<i>Cichlasoma salvini</i>	Cichlid	4
<i>Hyphessabrycon compressus</i>	none	7
Total		247

Note: A listing is not provided for the 1995 MMAP macroinvertebrate collection. The field identifications are considered highly tentative. They will likely undergo massive revision as laboratory analyses are finalized. These specimens probably include a large number of previously undocumented variants (indeed, initial lab studies have already revealed at least four new species of beetles).