APPENDIX "B"

PRELIMINARY REPORT TO THE ANGUILLA ARCHAEOLOGICAL AND HISTORICAL SOCIETY ON THE ARCHAEOLOGY OF FOUNTAIN CAVERN

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Background

This report is based on a thirteen-day research trip to Anguilla at the invitation of the Anguilla Archaeological and Historical Society (AAHS) and the Government of Anguilla. The visit took place from 5 to 17 January 1986. The primary purpose of the research trip was to conduct an initial assessment of the prehistoric archaeology at Fountain Cavern.

Fountain Cavern is located in the midst of the first national park to be created on Anguilla. This site has the possibility of being developed as: (1) a tourist facility to strengthen the economy of the island and (2) an educational facility for the people of Anguilla. By careful planning, the site can be developed to fulfill both objectives because they are not mutually exclusive.

The archaeological research at Fountain Cavern was the first of a number of scientific studies to be conducted at the site. After my research had taken place, a geologist and speleologist were to conduct their own studies. Government and the AAHS are to be commended for initiating these scientific studies in the planning stage of the site's development.

At the request of the AAHS, this report is being submitted about one month after completion of the fieldwork. It is a preliminary report because the artifacts and data derived from the archaeological research have yet to be thoroughly analyzed. The AAHS requested the preliminary report to provide other scientists conducting research later with specific information about the archaeological project. A final archaeological report will be submitted when analyses are completed.

Primary funding for the Fountain Cavern scientific survey was made available through a Canadian International Development Agency (CIDA) grant to Anguilla. Supplemental funding for archaeological research came from the M. Graham Netting Research Fund of Carnegie Museum of Natural History (CMNH).

Previous archaeological research

This study was the first archaeological research I have conducted on Anguilla, although I have previously worked on Barbuda, Montserrat, and

Antigua. Prior to being asked to participate in the Fountain Cavern work in January 1986, I had already arranged with AAHS an archaeological research project on Anguilla for September and October 1986. The first trip was limited to Fountain Cavern; the latter project will involve open sites near Anguilla's coast.

Until recently, relatively little was known about the prehistoric archaeology of Anguilla. As the same can be said for many of the Leeward Islands, the lack of information about Anguilla was by no means a unique situation. One artifact from Anguilla has caused much speculation for over 100 years, ever since it was mentioned and illustrated by the paleontologist E. D. Cope. This shell "chisel" or celt purportedly was associated with the bones of Amblyrhiza inundata, a giant fossil rodent.

Two projects pertinent to Anguilla's archaeology were undertaken in 1979. First was the archaeological component of a broader environmental reconnaissance study of Dog Island, one of the outliers off the coast of Anguilla, for the U.S. Department of the Navy. This project did not involve archaeological survey on Anguilla proper. Second was a brief reconnaissance survey sponsored by the Island Resources Foundation (IRF) as part of the Eastern Caribbean Natural Area Management Program. Fountain Cavern is briefly mentioned in the IRF report.

More recently, the AAHS has been actively involved in locating sites and surface collecting selected artifacts. The efforts of the Society's members have greatly increased our knowledge of the distribution and antiquity of the prehistoric sites. Fountain Cavern has been a research focus of the AAHS, in terms of both its petroglyphs and artifacts. This previous research has been invaluable for the present project.

Methodology

The strategy used in assessing the prehistoric archaeology of Fountain Cavern involved a general survey of the floor of the cavern, the excavation of selected test pits, and an examination of the known rock carvings (petroglyphs). This strategy was adopted because it facilitates an overview of the distribution of artifacts within the cavern and, at the same time, provides information about the depths of cultural deposits in various areas of the cavern. At the request of AAHS, most of my time was spent on test pit excavations.

No surveyed map or plan of Fountain Cavern was available at the time of the project. Sketch maps are attached to this report to aid in the discussion.

1. General survey

A survey of the interior of the cavern served to orient me to its general outline and form. For the purposes of this report, I have divided the area of the cavern into two chambers. Chamber 1 includes the vertical entrance and domed ceiling area in the front of the cavern. Chamber 2 begins at the raised platform occupying the middle of the cavern and continues into the deepest recesses. Chamber 2 contains several columns (joined stalactites and stalagmites) and the pool in the rear of the cavern.

Chamber 1 contains the majority of the archaeological remains. This includes all of the identified petroglyphs and most of the artifacts observed on the cavern floor. Chamber 1 is the only part of the cavern into which daylight normally penetrates. From the relatively level area under the entrance where the tree roots are anchored, the floor of chamber 1 slopes sharply downward to the east and south. A pool is found at the lowest point in chamber 1.

Chamber 2's floor is a relatively level expanse at a higher elevation than the sloping floor of chamber 1. In the front of chamber 2 (near the columns), the floor and ceiling are in closest proximity; in the rear of that chamber the ceiling once again rises. The bats occupy the ceiling in the rear of chamber 2. Very few artifacts were observed on the floor of chamber 2.

The only area of the cavern where the floors of chambers 1 and 2 are at about the same elevation is along the west wall. For chamber 1, the "floor" really consists of massive roof falls (on which are carved some petroglyphs).

Soil depth is quite different between chambers 1 and 2. The sloping floor of chamber 1 consists of soil mixed with roof spalls except in those areas where bare rock protrudes. There are two areas (one sloping to the east; one to the south) where soil has been transported downslope from the base of the tree roots. Soil in these "wash" areas probably was moved by three mechanisms: (1) gradual downslope movement, (2) by water during heavy rain (coming through the entrance), and (3) by movement of people (each "wash" area having been used as a trail). Deposition in chamber 2 is negligible compared with chamber 1; the sediment seems to consist mostly of bat excrement. The rear of the cavern near the pool has the deepest deposit in chamber 2.

It is evident that extensive spalling has occured from the ceiling and probably the walls of chamber 1. These spalls have been transported downslope to the extent that piles of rock occupy many of the crevices along the east wall. The rocks showed a considerable range in size, as would be expected for spalls in a limestone cave. Also, it was observed that the tips of many of the stalactites in chamber 1 were broken off, thereby further contributing to the deposition process. Numerous chunks and fragments of stalactites were found in test pit 1 during excavation. Initially these were recovered to see if they had any indication of human modification such as carvings. No carvings were observed.

2. Test pits

Based on observations made during the general survey of the cavern floor, I decided to focus the archaeological work in chamber 1. The actual placement of test pits depended on several factors: (1) the density of artifacts in locations surface collected by AAHS, (2) the depth of soil deposit where observable, (3) the location of the "wash" areas with downslope transport, and (4) the proximity of petrogplyphs. Two of the three test pits were dug in chamber 1; the third was dug on the raised platform of chamber 2. All test pits were 1 by 1 m and dug to bedrock.

Test pit 1 was dug in the southeast section of chamber 1, close to the carved stalagmite (termed Jocahu or petroglyph #2 by Douglas -- see bibliography) and the petroglyph (#1; feathered headdress) on the pillar near the pool. The relatively level space (labelled Area A) in front of the stalagmite was cleared of about 80 cm of loose rock (spall) before a soil layer was found. The AAHS previously had sorted through most of this rock while surface collecting artifacts and then piled it again at the base of the stalagmite to prevent digging by unauthorized persons. The rocks were formed into a retaining wall to stop them from falling into the pool below.

The matrix of test pit 1 consisted predominantly of spall intermixed with patches of soil. Distinct soil layers were rare in test pit 1. Artifacts occurred throughout the test pit but cannot be regarded as having been found in primary context. There is no doubt that artifacts and soil have been transported downward through the crevices and holes found among the loose, unconsolidated rocks. Modern objects (bits of plastic, coins, glass) were found adjacent to prehistoric artifacts at a considerable depth in test pit 1. The test pit was dug to a depth of 155 cm below ground level at which point wet bedrock was encountered. This corresponded to the floor level of the nearby pool.

Test pit 2 was dug further back in the cavern, on the raised platform in chamber 2. The protruding bedrock in the immediate vicinity indicated test pit 2 would be quite shallow. I chose to dig this pit to verify the limited depth of deposit and the paucity of artifacts in chamber 2. The sediment layer atop the bedrock consisted mainly of bat excrement and decomposing limestone. Total depth was about 5 cm, being slightly deeper only in a depression in the middle of test pit 2. Two ceramic sherds were found in the entire test pit.

Test pit 3 was dug at the base of the tree roots in chamber 1. This location was chosen because of its position below the only known entrance, its proximity to a number of petroglyphs, and the depth of deposit. The matrix of test pit 3 consisted mainly of soil. As with test pit 1, the artifacts in test pit 3 were not in primary context. Historic objects were found throughout the deposit; they included two Bellarmine stoneware sherds in the lower part of the pit. Archaeological materials were found in the pit to just above bedrock, to a depth of about 30 cm. Bones and land snail shells were recovered in quantity from fissures in the bedrock. These faunal remains generally were not found in direct association with the artifacts; therefore, they may represent the level existing prior to human occupation.

At the request of AAHS, the test pits were not filled in after the completion of the excavations. Although back filling of test pits is standard archaeological practice, AAHS asked that these pits be left open to aid other scientists in their later research.

3. The petroglyphs

Examination of the petroglyphs took place on the first and last days of the dig. I decided to restrict the amount of time devoted to their study because Douglas has already conducted quite a bit of research on the petroglyphs. Twelve petroglyphs were observed. They are in excellent

condition and do not show evidence of damage or vandalism. There also are several formations that could be "possible" rock carvings. However, the features and attributes of these formations cannot be said to have been made for certain by humans. They could be natural formations that merely resemble petroglyphs.

Considerations and Recommendations

Preliminary considerations and recommendations about Fountain Cavern are presented below in several different categories.

1. Philosophical considerations

a. Purposes. It is important to determine the reasons or purposes for development of Fountain Cavern. In my view, the site can serve two purposes simultaneously. It can serve an economic role by being developed as a facility to enhance tourism. It can also serve an educational role for the people of Anguilla. The dual roles of economy and education are not mutually exclusive categories but instead can be complementary ones if carefully planned.

b. Activities. It is also important to look at Fountain Cavern and the national park in terms of broader scale, longer term development plans. Fountain Cavern lends itself only to certain kinds of activities, themes, or programs, while other sites on Anguilla probably could better address other activities. Determination of which sites will cover which activities is important now, during the planning stages.

c. Ecology. The activities to occur at Fountain Cavern should be planned with the integrity of the cave and its fauna in mind. It is important to integrate the cave fauna into the themes being developed for the site. Fountain Cavern is a unique habitat and this fact should be emphasized in the activities. Such ideas a "gassing" the bats run counter to prevailing attitudes (including those of potential funding agencies).

Recommendations:

a. Fountain Cavern should be developed both as an tourist facility (to stimulate the economy) and an educational facility for the people of Anguilla.

b. Fountain Cavern should be developed with restricted themes in mind. These themes should relate to the cave itself, its native fauna, and the Amerindian occupation. Other themes should be developed at other sites (e.g., the Wallblake house for the historic period of occupation).

c. The unique habitat and fauna of Fountain Cavern should be maintained rather than eliminated.

d. Planners should visit other cave sites in the Caribbean to see what has been developed elsewhere. I would recommend Harrison's Cave on Barbados and the soon to be opened Camuy Caves near Arecibo, Puerto Rico.

2. Engineering considerations

a. Safety. It is of utmost importance that the structural soundness of Fountain Cavern be established early in the planning process. If the site is found to be unsafe for visitors, then the planning of programs becomes moot unless the cavern can be made safe.

b. Rubble. The amount of spall in areas of the cave is significant. If this were removed, the scenic aspect of the cave would be enhanced. It is unlikely the removal of spall would affect the integrity of the cave. Based on my work in the test pits and obervations in chamber 1, removal of the spall will be a time consuming and costly activity.

c. Viewing platform. One idea was to establish a circular staircase down the vertical entrance to a viewing platform (possibly multi-level) below. Obviously, the platform would have to be well anchored. It also should be designed such that the visitor was unable to reach out and touch or otherwise damage the petroglyphs. The staircase should be built such that it does not destroy the roots of the tree in the entrance; it should be covered to prevent bat excrement from littering the steps.

d. Second entrance. This possibility was suggested so that the bats would have a means of access other than that used by visitors. I cannot comment on the engineering feasibility of this idea. However, I strongly suspect a second entrance would dramatically modify or alter the cavern's environment, perhaps to the point of defeating the purpose of developing the site.

e. Surveyed map. A survey with vertical and horizontal control of the Fountain Cavern is important to the scientists and engineers who will become involved. Also, terminology should be standardized among all of the participants. For example, my use of chambers 1 and 2 may not correspond to the terms used by the geologist or speleologist. Lack of standard terminology and a surveyed map will cause unnecessary confusion.

Recommendations:

a. Safety and engineering concerns must be given attention early in the project.

b. Constraints on engineering options (e.g., no second entrance, no removal of tree) should be established early.

c. Any proposed alteration of Fountain Cavern should be considered with regard to the potential detrimental impact on the cave fauna and the planned activities.

d. Standardize terminology among participants. Provide a base map for everyone involved.

3. Archaeological considerations

a. Within the cavern. Fountain Cavern has the potential to become an extremely important facility for interpreting the culture of the Amerindian peoples of the Caribbean. The major focus within the cavern should become the petroglyphs themselves. A locale with so many well preserved cave petroglyphs is unknown elsewhere in the Lesser Antilles. It is the possibility of combining information about the natural and cultural history of Fountain Cavern that is so exciting. Harrison's Cave, for example, has only natural, not cultural, components.

Activities related to the archaeology of Fountain Cavern can be restricted to chamber 1, where the petroglyphs occur. Fountain Cavern appears to have been a ceremonial site for the Amerindian population of Anguilla (and possibly nearby islands). The ceramic materials recovered from the cavern indicate the cultural occupation probably occurred in the

late first or early second millenium A.D. This timeframe is relatively recent in terms of the earliest known occupation by ceramic-bearing Indians (around A.D. 1). Examples of ceramics associated with this early occupation are rare on Anguilla (and even rarer from Fountain Cavern).

Nevertheless, Fountain Cavern could be developed into a spectacular site drawing on three strengths: (a) the well preserved petroglyphs, (b) the ceremonial center theme, and (c) known Amerindian myths about caves, associated fauna (e.g., bats), and deities. Within the cavern proper, these are the themes that should be presented to the visitor.

Recommendations:

a. The viewing platform should be built such that the visitor can see all of the petroglyphs, although not necessarily all at once. The visitor should not be able to touch or otherwise damage the petroglyphs. Their excellent condition to date is due largely to the fact they were not known to most visitors to the site. Even so, some graffiti is already marring the scene.

b. Upon the visitor's entry into Fountain Cavern, the petroglyphs should be in the dark and not visible. In sequence, different petroglyphs should be illuminated by spot lights, such that only one or two are visible at one time. In coordination with the lighting, a recorded talk about the myths of the Amerindians and the function of the cavern as a ceremonial site should be presented. This will tend to "humanize" the petroglyphs (which after all only are stone) and the people who made them.

c. The process just described has been used very effectively in a range of different settings. It is generally known as "son et lumiere" (sound and light). I can think of no more spectacular means of using the petroglyphs. Further, various geological formations within the cavern (e.g., columns and stalactites) could be similarly lit.

d. Activities within the cavern itself should be primarily dramatic and entertaining; the educational aspect should be secondary.

e. Anguillians should be hired to act as guides for the visitors. Visitors should not be allowed to enter the cave unescorted, as this can present the opportunity to damage the petroglyphs.

b. <u>Outside the cavern.</u> A museum/interpretation center should be established near the entrance to Fountain Cavern. This would be the main educational component of the complex at which the visitor has the chance to learn more about the cavern, its fauna, and the Amerindian occupation. In essence, it should have subthemes dereived from geology, biology and anthropology. The first two subthemes should be restricted to Fountain Cavern.

I would strongly recommend the third subtheme be broader and include information on the Amerindian occupation of the entire island. In other words, this is the appropriate place to present all information about the prehistoric peoples of Anguilla. This would include information about the time of occupation, the distribution of sites, the kinds of artifacts found, and environments existing during Amerindian habitation. It would allow for the interpretation of artifacts displayed in the museum.

One other aspect about Fountain Cavern that could be included in the museum is the folk traditions about the site. I refer here to the tales

and legends of Fountain Cavern known to the people of Anguilla today. In my short visit, I was made aware of a number of these legends. They would serve to relate Fountain Cavern to today, rather than simply to the past Amerindian occupation.

Recommendations:

a. The museum/interpretation should center serve as an orientation point for people before they descend into the cavern itself. It should provide an educational opportunity for the visitor before he encounters the dramatic, entertaining activities within the cavern. It also might serve to orient the visitor to the national park in general.

b. The museum should provide information about Fountain Cavern's geology, biology, and anthropology. It also should treat the entire Amerindian occupation of the island, since that would not be dealt with at any of the other activity sites on Anguilla (e.g., Wallblake house would be restricted to the historic period).

c. In addition to static displays of Amerindian artifacts in the museum, consideration should be given to use of audiovisual presentations, perhaps in a separate theater.

d. The facility should include a restaurant or snack shop run by Anguillans.

e. Certainly, it should include a gift shop. A whole range of very interesting gifts could be sold here by Anguillans. I highly recommend casts, photos and slides, posters, and drawings of the petroglyphs be for sale, as well as booklets about Anguilla, Fountain Cavern, Amerindians, and the cave fauna. This could include a specific guidebook for Fountain Cavern similar to the one for Harrison's Cave.

c. Averting damage to archaeological deposits. Only a small portion of the archaeological deposits in Fountain Cavern has been excavated and removed. As the project enters the stage where construction is to begin, the remaining archaeological materials will be in danger of being destroyed. Destruction can be averted by several strategies. First, the viewing platform and support structure can be designed such that its installation will avoid or minimally impact on the archaeological remains. Second, those archaeological materials that will be affected can be excavated. Third, all deposits of archaeological material can be removed prior to construction.

Although the third strategy might seem the one most acceptable to an archaeologist, this is not necessarily so. It is standard archaeological practice not to remove all of a deposit unless it is threatened with total destruction. Part of the deposit is left in order that further research can occur in the future, when new techniques and methods have been devised. The wisest strategy would seem to be excavation of the part of the archaeological deposit that is threatened by construction. When possible, the construction planning should take into account ways in which damage to the archaeological remains could be avoided. For example, the support structure for the platform could be designed such that its legs would rest where archaeological materials are known not to occur.

In the event destruction of archaeological remains is unavoidable, the threatened materials should be completely removed by qualified archaeologists.

The areas of Fountain Cavern that should be carefully examined for evidence of archaeological materials include: (a) the level area at the base of the roots (near test pit 3), (b) the area immediately in front of the stalagmite by the pool (near test pit 1), (c) the "wash" areas leading downslope from the the roots, (d) the area behind the petroglyphs on the large roof falls along the west wall, (e) the piles of rock along the east wall, and (f) the two pools, one in chamber 1 and the other in the rear of chamber 2. These pools contained a number of ceramic fragments and it is possible that pottery was purposefully deposited in them. The spall in the pools should be removed and the ceramics could be recovered at the same time.

Recommendations:

a. Continue testing of the areas of Fountain Cavern that are known or suspected to contain archaeological materials. This will allow for a better plan of action to protect or remove the archaeological materials. The locales mentioned above are shown on the sketch map.

b. Determine if the construction design can avoid the areas of high archaeological potential. Where possible, design around these high probability areas.

c. Where damage is not avoidable, remove the archaeological remains entirely through controlled excavations.

d. Enclose the petroglyphs in protective material (e.g., wooden frames) while construction is ongoing.

e. Utilize the recovered archaeological materials to enhance the display in the museum.

Summary

Fountain Cavern contains important archaeological deposits that can play an important role in the development of the site. The petroglyphs offer a superb motif around which to develop dramatically the Amerindian ceremonial use of the cavern. A museum/interpretive center would provide the mechanism for fulfilling educational role of the site. As long as the cavern is found to be structurally sound, I strongly recommend that the AAHS and Government pursue plans to develop the site as a major tourist attraction and educational facility. Properly done, Fountain Cavern could become a showplace for development in the eastern Caribbean region.

Acknowledgments

The archaeological research on Anguilla would not have been possible without the assistance of the Anguilla Archaeological and Historical Society and the Government of Anguilla. I am grateful for the kind courtesies extended by all. Most specifically, I thank those persons who assisted me with the work in the bottom of the cavern -- Tim Hodge, David Carty, Nik Douglas, Don Mitchell, Penny Slinger, Bridgette McCarthy, Roland Richardson, and especially Andy Graff.

Appendix 1

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Appendix 2

Status of Artifact Analyses

1. Two shell samples from test pit 1 have been submitted for radiocarbon analysis to Beta Analytic, Inc.
2. Two charcoal samples(?) from test pit 1 have been submitted for radiocarbon analysis to Beta Analytic, Inc.
3. Two sherds from test pit 1 have been submitted for thermoluminescense analysis to Alpha Analytic, Inc.
4. Ceramic sherds have been submitted for thin-section analysis to Rudolf von Huene Laboratory.
5. Anlaysis of sherds and fauna material is currently being arranged.

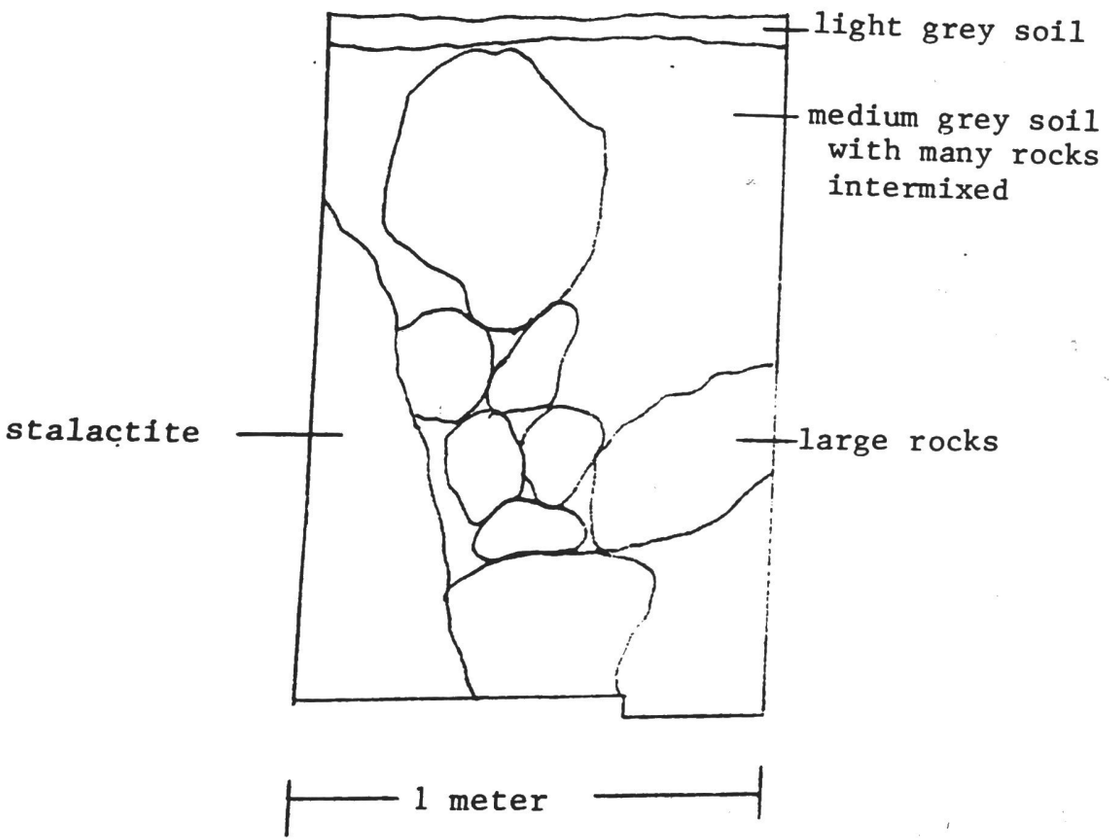
Appendix 3

Maps and Plans of Fountain Cavern and Test Pits

(attached)

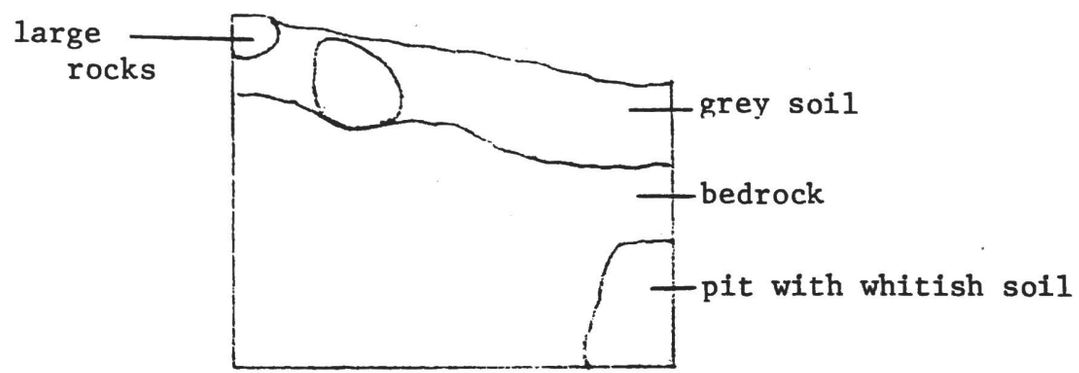
Fountain Cavern, Anguilla

Test pit 1 (north profile)

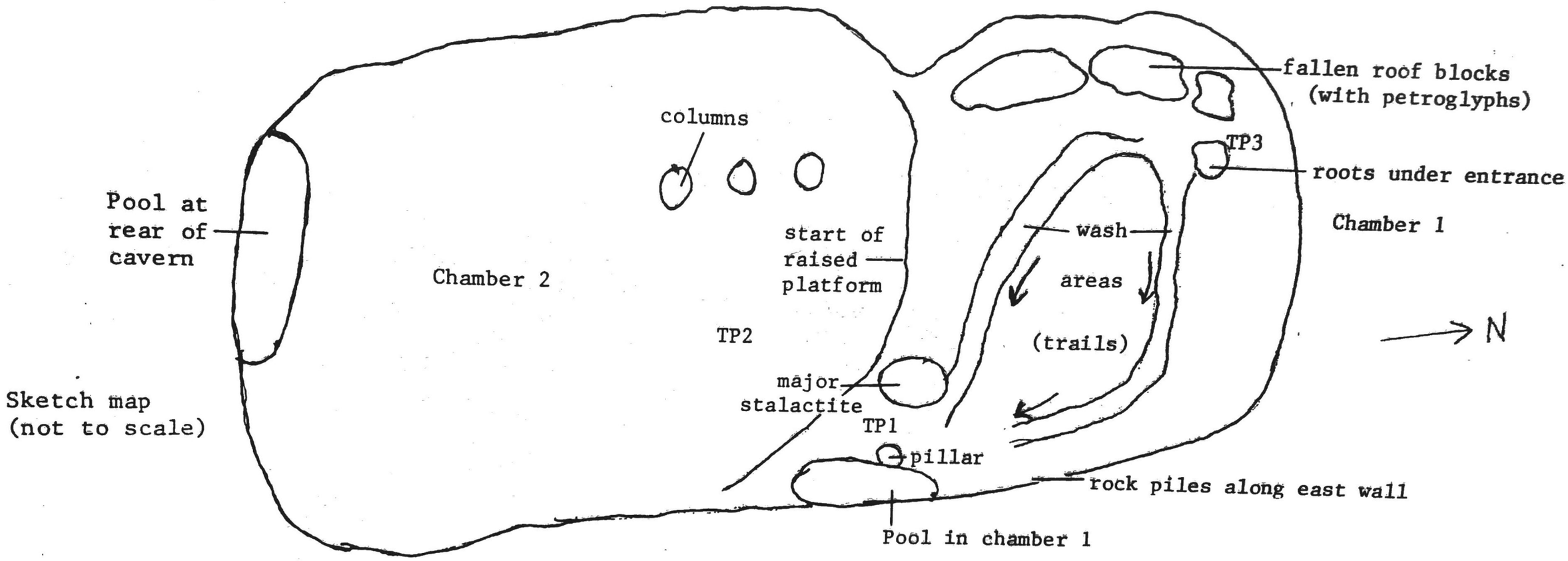


Test pit 2 (north profile)

Test Pit 3 (east profile)



David R. Watters (FEB 86)

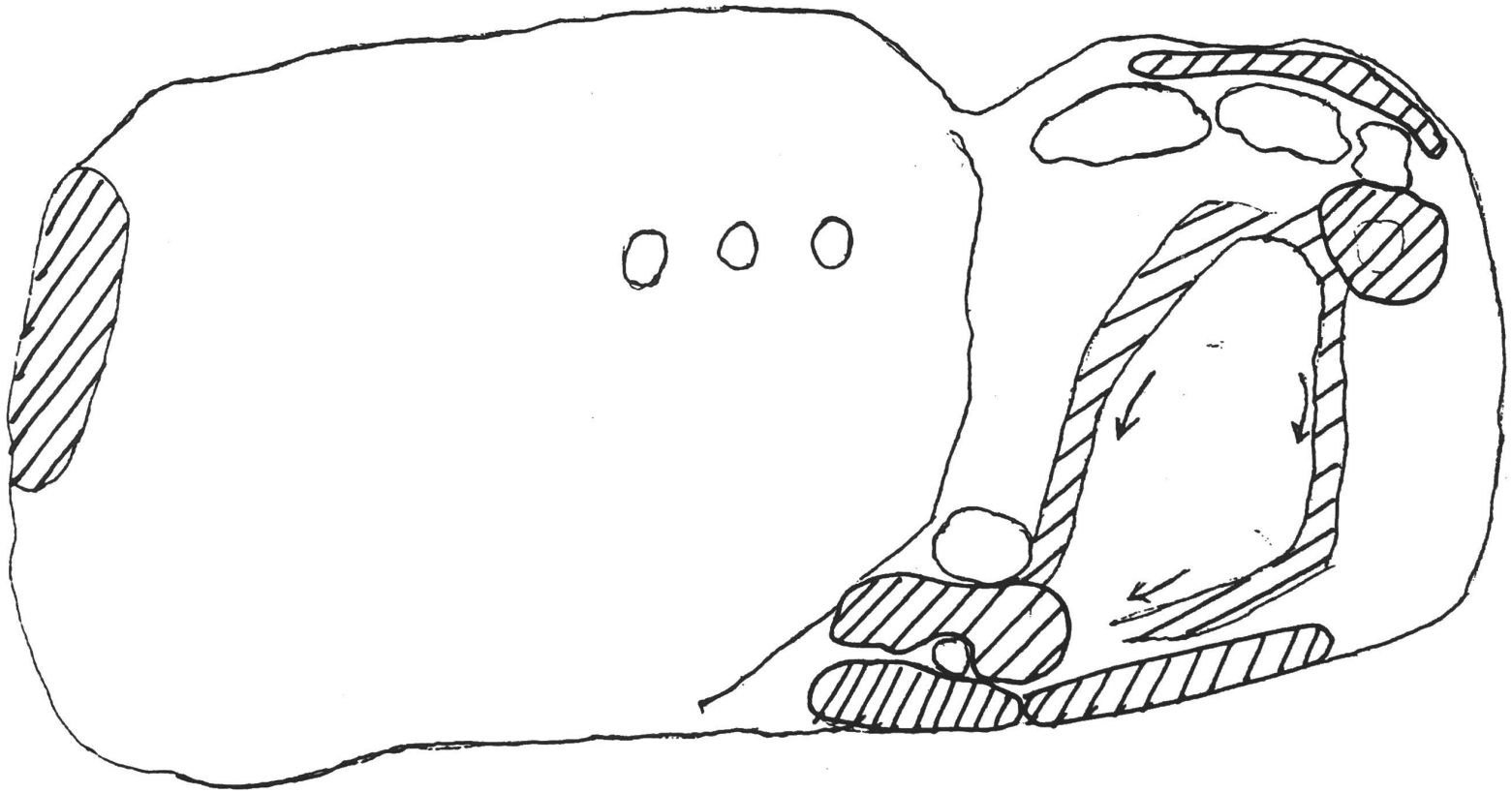


Fountain Cavern, Anguilla

(Sketch map)

David R. Watters
FEB 86

Sketch map
(not to scale)



N

Fountain Cavern, Anguilla

(areas of high archaeological potential)

David R. Watters
FEB 86

BETA ANALYTIC INC.
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P.O. BOX 248113
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REPORT OF RADIOCARBON DATING ANALYSES

FOR: David R. Watters
Carnegie Museum of Natural History

DATE RECEIVED: March 10, 1986
DATE REPORTED: April 3, 1986
BILLED TO SUBMITTER'S INVOICE NUMBER

1 CARBON SAMPLE
from FOUNTAIN CAVERN. TREE PIT 2.

OUR LAB NUMBER	YOUR SAMPLE NUMBER	C-14 AGE YEARS B.P. ± 1σ	
Beta-15824	ALI-3	1530 ± 140 B.P.	(0.2 gram carbon)

Note: the small sample was given extended counting time.

These dates are reported as RCYBP (radiocarbon years before 1950 A.D.). By international convention, the half-life of radiocarbon is taken as 5568 years and 95% of the activity of the National Bureau of Standards Oxalic Acid (original batch) used as the modern standard. The quoted errors are from the counting of the modern standard, background, and sample being analyzed. They represent one standard deviation statistics (68% probability), based on the random nature of the radioactive disintegration process. Also by international convention, no corrections are made for DeVries effect, reservoir effect, or isotope fractionation in nature, unless specifically noted above. Stable carbon ratios are measured on request and are calculated relative to the PDB-1 international standard; the adjusted ages are normalized to -25 per mil carbon 13.

126-

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REPORT OF RADIOCARBON DATING ANALYSES

FOR: David R. Watters
Carnegie Museum of Natural History

DATE RECEIVED: January 30, 1986
DATE REPORTED: February 21, 1986
BILLED TO SUBMITTER'S INVOICE NUMBER

2 SHELL SAMPLES
from FOUNTAIN CAVERN, Test Pit 1.

OUR LAB NUMBER	YOUR SAMPLE NUMBER	C-14 AGE YEARS B.P. ± 1σ
Beta-15485	ALI-RC1	1220 ± 70 B.P.
Beta-15486	ALI-RC2	1130 ± 80 B.P.

These dates are reported as RCYBP (radiocarbon years before 1950 A.D.). By international convention, the half-life of radiocarbon is taken as 5568 years and 95% of the activity of the National Bureau of Standards Oxalic Acid (original batch) used as the modern standard. The quoted errors are from the counting of the modern standard, background, and sample being analyzed. They represent one standard deviation statistics (68% probability), based on the random nature of the radioactive disintegration process. Also by international convention, no corrections are made for DeVries effect, reservoir effect, or isotope fractionation in nature, unless specifically noted above. Stable carbon ratios are measured on request and are calculated relative to the PDB-1 international standard; the adjusted ages are normalized to -25 per mil carbon 13.