

**KENNETH P. EMORY AND “HERBERT C. SHIPMAN CAVE”:  
A LONG-STANDING PUZZLE SOLVED**

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On 13 and 14 September 1945, Kenneth P. Emory of the Bishop Museum investigated what he later termed “Herbert C. Shipman Cave,” twelve miles from Hilo in the northern Puna District of Hawai‘i Island. His typescript of this investigation is frequently cited, but the cave remained unidentified until recently. In 1996 a Hawaii Speleological Survey team located a signature of Emory in the upper part of Keala Cave, at the site of a 1945 newspaper fragment previously found by another Hawaii Speleological Survey team. Other pukas explored and described by Emory as part of “Herbert C. Shipman Cave” unmistakably are entrances of Kazumura Cave, a different cave in a separate flow unit of the Aila‘au Flow Field of Kilauea Volcano. While he considered the possibility that he might be wrong, Emory mistakenly thought all his exploration to be part of a single “Herbert C. Shipman Cave,” which never existed per se. Use of this name should be replaced by proper designation of Kazumura and Keala Caves, depending on the context. Radiocarbon dating of charcoal in the section of Keala Cave visited by Emory strongly suggests but does not prove that the entire cave was explored by early Hawaiians.

KENNETH EMORY (1897–1992) dominated Hawaiian archaeology throughout most of the twentieth century (Takeuchi 1992). With little interest in Hawaiian cave archaeology before 1950, Emory’s 1950 unexpected findings in Oahu’s Kuliouou Cave caused a major shift in emphasis from large, impressive ancient structures to detailed studies of stratigraphy and small-scale phenomena. It may be of special interest to present readers that he contributed an article to the first issue of this journal (Emory 1977).

While preparing an initial bibliography of Hawai‘i speleology, one of us

(W.R.H.) noted repeated references to a puzzling “Herbert C. Shipman Cave” (sometimes shortened to “Shipman Cave”) reported by Emory (1945). The name appears especially in reports of archaeologists in environmental impact statements. In all such reports reviewed to date, it is clear that the writers had not relocated this cave in their own field studies or in other literature. In its own systematic fieldwork in Puna District and an additional bibliographic search, the Hawaii Speleological Survey initially fared no better. Descriptions of certain features suggested that Emory visited part of Kazumura Cave and part of Keala Cave (Figure 1), two caves located in separate flows of the Aila’au Flow Field of Kilauea Volcano (Holcomb 1987:27; Oberwinder 1995). However, conclusive confirmation was lacking. Through artifacts left by the 1945 Emory party and by systematic comparison of Emory’s narrative with existing cave features in this area, we subsequently were able to solve the puzzle conclusively.

Particular problems in the identification of “Herbert C. Shipman Cave” were as follows. (1) Today’s names for the major caves of this area did not exist in 1945. (2) Hawaiian names for two of the pukas (entrance sinkholes) Emory cited had faded from local memory, and the name he gave a third puka seems never to have been used by anyone else. While the name and approximate location of one of the pukas appeared in handwritten testimony of the 1873 Boundary Commission (Puaa 1873; Uma 1873), this information was so little known or so closely held that it did not come to our attention until December 1996. (3) The only other landmark mentioned by Emory (a corral along what now is Highway 13) disappeared long ago, and its location seems to have been forgotten or confused with another closer to Kea’au.

### **Emory’s Narrative**

In deciphering this puzzle, we followed Emory’s footsteps as described in his own words and compared his descriptions with present-day field findings. On Thursday, 13 September 1945, Emory drove from the seaside Kea’au Ranch house of Herbert C. Shipman to a corral “approximately 12 miles from Hilo” on the Kea’au-Pahoia road (now Highway 13). Herbert C. Shipman was a wealthy part-Hawaiian landowner and manager of the extensive Shipman family holdings, noted for expansive hospitality and breadth of interests (Cahill 1996). He clearly organized and probably financed at least the on-island part of Emory’s reconnaissance. At the corral Emory joined a small group including Henry Haa, Shipman’s chief of staff and confidant (Cahill 1996). (Emory misspelled the name as Ha.) All went by horse to a puka he recorded as “Oleoleana,” “a circular pit with overhanging edges, 30 feet across and some 20 feet deep.” His team included three Hawaiians, who

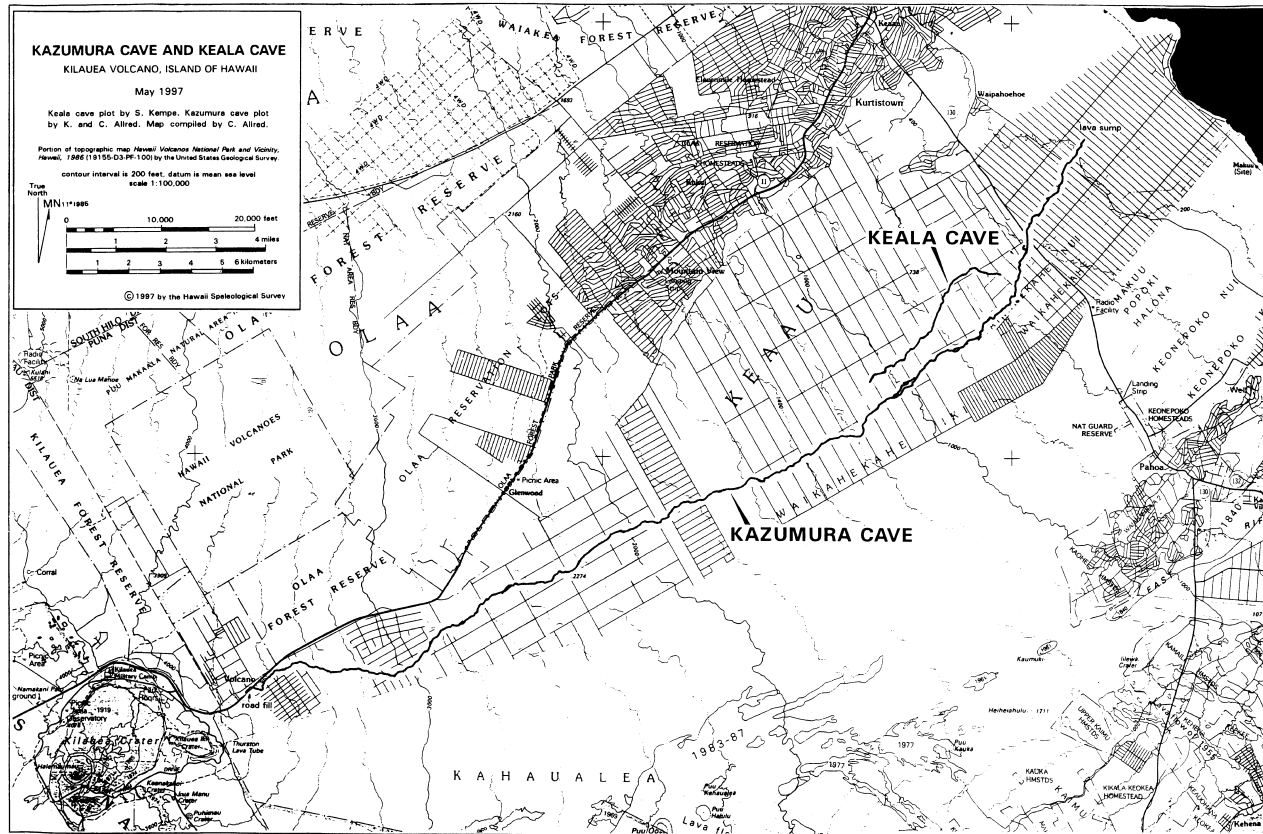


FIGURE 1. Location of Kazumura Cave and Keala Cave, south of Hilo, Hawai'i. (Map compiled by C. Allred)

guided him to pukas on both sides of the highway (Emory called them *kipukas*), and Emory believed that all were parts of a single cave, which he named “Herbert C. Shipman Cave”—a misapprehension that was to cause confusion for more than half a century.

At least two of the party were natives of the area. Either they did not know or did not tell Emory that in 1873 the name of the pit had been recorded with a slightly different spelling—“Olioliana”—and that it was a common point of Kea’au, Waikahekahe, and Waikahekaheiki *ahupua’a*, native Hawaiian land divisions (Puaa 1873). “Olioli” is translated by Pukui and Elbert as “delight, enjoyment” or “chanter” (1992). *Ana* means “cave.”

Circular pits with overhanging edges twenty feet deep and thirty feet wide are so common in Puna as to be unremarkable. Emory estimated the distance to this one from the highway as about two miles. This estimate did not greatly reduce the number of Puna pukas that might have been Oleoleana or Olioliana Puka. However, Keala Pit, a well-known feature about thirty feet deep and twenty feet wide—the reverse of Emory’s estimates—is about two and three-quarters miles upslope from the highway, in an area now undergoing rapid urbanization. In retrospect, even without knowing that Olioliana was somewhere near the present-day common point of the three *ahupua’a*, members of the Hawaii Speleological Survey should have been quicker to recognize that Emory was describing Keala Pit.

As did Puaa and Uma seventy-two years earlier, two brothers in Emory’s team (Henry and Eddie Haa) knew the cave below as an ancient refuge in time of war. Further, the Haa brothers had been told that it “ran all the way to the sea” (apparently they had never been in it). Today, local residents still talk of Keala Cave “running all the way to the sea,” and few of them have entered it. Rock fortifications and slingstones reported by Emory are still in place, and other cultural material is undisturbed by the urbanization overhead.

Emory descended this overhanging pit and initially looked into the upslope mouth of the cave below. Then he proceeded downslope with some of his team, traveling an estimated one-half mile to another puka known to the Haa brothers as Keakiu Puka. During Hawaii Speleological Survey mapping of Keala Cave, the actual distance to the next puka was found to be 0.496 miles, straight-line distance. This remarkable accuracy was typical of Emory’s estimates during this reconnaissance. Beyond Keakiu Puka, Emory’s team continued underground for an estimated additional one-quarter mile (actually 0.257 miles when mapped) to a point where the cave has an unmistakable upper level recorded by Emory. Here they scratched names on the walls, then returned to Olioliana for lunch. Our teams did not find any such scratched inscriptions. We did find a scratched “TW” and a “45” seventy

meters farther downslope at the top of a lavafall 3.5 meters high; their significance is unclear at this time. Either Emory described the site of the “scratched names” inaccurately, some scratches were too superficial to persist for fifty years, or our teams simply missed the inscription.

After lunch, Emory and the others turned to the cave section upslope from Olioliana Puka. At 175 and 325 yards they observed daylight entering from above. Later they determined that the first daylight site actually was another entrance to the cave, with ti plants growing in it (as they do today in the next entrance upslope from Keala Pit). The Haa brothers knew no name for this puka (even today it is much less known than Keala Pit), and Emory dubbed it “Poi Pounder Cave.” Later in his report he shortened this name to “Pounder Cave.” We have been unable to find anyone else who has identified it by either name, and it is now known as “Ladder Puka” because of an old ladder lying on its floor.

From “Poi Pounder Cave” the group continued another 2,450 paces without finding “a single shell or any sign of human occupation.” This statement is curious because Hawaii Speleological Survey members found scattered fragments of *kukui* nut and wood charcoal along what appeared to be this portion of Emory’s route and beyond—all the way to the upper end of the cave. As discussed below, special consideration was given to this additional puzzle.

Emory recorded that his team marked their farthest point by “setting up a candle,” then returned to the ranch house for the night. On 23 July 1993 a Hawaii Speleological Survey team (Stephan Kempe, Dave Hubbard, and Susan Dotson) found a candle in Keala Cave, 7,297 feet (2.22 km) upslope from the “Poi Pounder Puka” entrance, the equivalent of 2,450 paces at 2.98 feet per pace, an acceptable average-pace length. With the candle were two “D” size flashlight batteries with expiration dates of 1946 and a scrap of newspaper published 31 August 1945 announcing the forthcoming V-J Day parade (Kempe 1993). In view of Emory’s statements about the lack of signs of previous non-Hawaiian visitation, it seemed likely that these artifacts were left by his party, but proof was lacking until 14 December 1996. On that date another Hawaii Speleological Survey team (Kevin Allred and Mike Shambaugh) wiped slime off the candle and found an entire inscription: “K P Emory 1945” (Figure 2). It now was indisputable that the upper section of Keala Cave is the upper part of “Herbert C. Shipman Cave” and, through the artifacts left in 1945, the archaeologist himself had become the object of archaeological investigation.

The lower end of Keala Cave is upslope from Highway 13, but “Herbert C. Shipman Cave” was said to extend far downslope beyond the highway. Close field attention to Emory’s text revealed the explanation. On 14



**FIGURE 2. Candle showing Emory's name, battery with expiration date of 1946, and fragment of *Honolulu Advertiser* dated 31 August 1945, all found in upper Keala Cave.** (Photo by K. Allred)

September 1945 the Emory group went to a puka in a different area, this one estimated to be one-quarter mile upslope from the highway and in line with Olioliana and the pukas they had visited on the previous day. It also led into a lava tube cave, "in all probability the same as the one we had explored on the previous day." In this area, three small pukas are known today. Emory was not specific enough to permit conclusive identification of the puka he entered here, but all three of these pukas open into Kazumura Cave rather than Keala Cave, sealed by the younger Kazumura lava almost three-quarters of a mile farther upslope. One of these three pukas is precisely one-quarter mile (400 m) from the highway; another is about eighty meters closer (the third is a small vertical shaft, clearly not the puka in question).

After a quick trip back to the "Poi Pounder Puka" entrance, Emory rode downslope with Henry Haa and an unnamed Filipino helper. At a point an estimated one mile downslope from Highway 13 and supposedly "300 yards" upslope from the old cane railroad, they entered still another cavernous puka (this one without any name known to Henry Haa). Emory refrained from naming this cave or puka, noting that Eddy Haa "felt certain it was a continuation of the (cave) at Oleoleana." Even though it was about five hun-

dred yards from the old railroad grade rather than three hundred, from his further description we suspected that it was another part of Kazumura Cave. He recorded a massive lava column dividing the passage, such as exists today in this part of Kazumura Cave, and still another unnamed puka “in which was growing an avocado tree.” On 29 December 1996 Hawaii Speleological Survey members rechecked the puka in the appropriate part of Kazumura Cave and indeed found a very old avocado tree in it. In our opinion, the evidence now was conclusive. “Henry C. Shipman Cave” never existed. Instead, Emory had found and studied parts of both Keala and Kazumura Caves.

Now that the sites of these 1945 investigations are clear, Emory’s report appears as a fascinating revelation of strengths and weaknesses of Hawaiian reconnaissance archaeology in the period before the breakthrough at Kuliouou Cave. Despite undeniable flaws, his typescript is a major contribution to both speleology and archaeology. Much of it is as relevant today as when he wrote it, and it truly is remarkable for the length of cave he covered in a very limited time. He described his findings with notable clarity and accuracy, identifying sections of the caves used for wartime refuge, for occasional overnight visitation, and for other cultural purposes. Evidently he took compass bearings, and his estimates of underground distances were remarkably accurate. The skeleton of a small pig, for example, can be observed today, precisely where he noted it.

As for Emory’s failure to recognize Keala and Kazumura Caves as separate caves, it is understandable considering the limited time at his disposal and the lack of organized speleology in Hawai‘i at the time. Confusing was his terming “Poi Pounder” as a specific cave within “Herbert C. Shipman Cave.” This nomenclature, however, was in accord with native Hawaiian traditions giving a different cave name to many different entrances to a single cave (even today this tradition persists among some well-known archaeologists). It should be noted that Emory’s usage of the word *kipuka* is in the traditional Hawaiian sense (Pukui and Elbert 1992), not current geological usage (Jackson 1997). In this part of Puna District, high vegetation is found in many cave entrances, making “pukas” (depressions or collapse holes) look like *kipukas* (localized elevations above the surface of lava flows).

We are unaware of any studies by other archaeologists in any section of Keala Cave or Kazumura Cave discussed by Emory. The confusion caused by his error may have obstructed studies that should have been conducted long ago. Fortunately, the cultural content of these sections of the caves is largely intact, despite the accelerating urbanization of the area. State-of-the-art professional studies following up on Emory’s observations should not be further delayed.

In some ways, it seems almost regrettable that the cave Emory attempted to name for Shipman never existed as such. In any event, further use of the name “Herbert C. Shipman Cave” or “Shipman Cave” would be misleading and is inappropriate. Future references to features and content of the caves described by Emory should be attributed either to Keala Cave or to Kazumura Cave, whichever is correct.

### **The Puzzle of the Charcoal**

When mapping the 2,953-meter upslope section of Keala Cave in 1993 (July 21, participants: Stephan Kempe, Stephen Smith, Steve Kadel, Scott Harris; July 23, participants: Stephan Kempe, David Hubbard, Sue Dotson; and July 31, participants: Stephan Kempe, Ole Fulks, Thomas Hargrave), small bits of charcoal were noticed on the floor. Although not mentioned by Emory, they were found all the way to the turnaround point of the Emory party between stations 96 and 97, 2,343 meters upslope from the entrance and even beyond, to the very end of the cave at station 119 (see Figure 3). Was this charcoal overlooked by Emory and of ancient origin, was it left by members of his party and/or immediate follow-up investigations by Eddie Haa or others, or was it comparatively recent?

The upslope end of Keala Cave is caused by an intrusion of black lava that can be followed for 196 meters on the cave floor before it plugs the upslope continuation of the cave passage. Neither this prominent feature of the cave nor a spectacular four-meter-high lavafall 250 meters upslope from the turnaround point was noted in Emory’s report, suggesting that Emory did not go to them. Before reaching the lower end of this intrusion, the downhill end of a secondary ceiling is encountered at survey station 109. The secondary ceiling divides the passage into an upper and a lower level, creating a sort of balcony across the passage. When we first reached this place, we noticed a few stones piled up below the balcony to facilitate climbing up onto the secondary ceiling, indicating that someone had already scouted the upper level.

In 1995 a survey team (participants: Stephan Kempe, Jan Strassenburg, Jens Hartmann, Ole Fulks) revisited this site in order to explore and map the upper level in the hope of continuing above and beyond the intrusion that plugs the lower passage. This upper passage starts with the “Red Room,” a small breakdown cupola obstructed by red lava breakdown. One has to scramble up this breakdown and can, after a few meters, climb down again to the floor of the secondary ceiling. From here a very small opening continues (about 30 cm high). Only one of us (S. Kempe) pushed this lead; it gives access to a series of small, glazed, flat-bottomed cupolas no longer



than ten meters and just high enough to sit up in. The upper passage ends here with no hope of continuation.

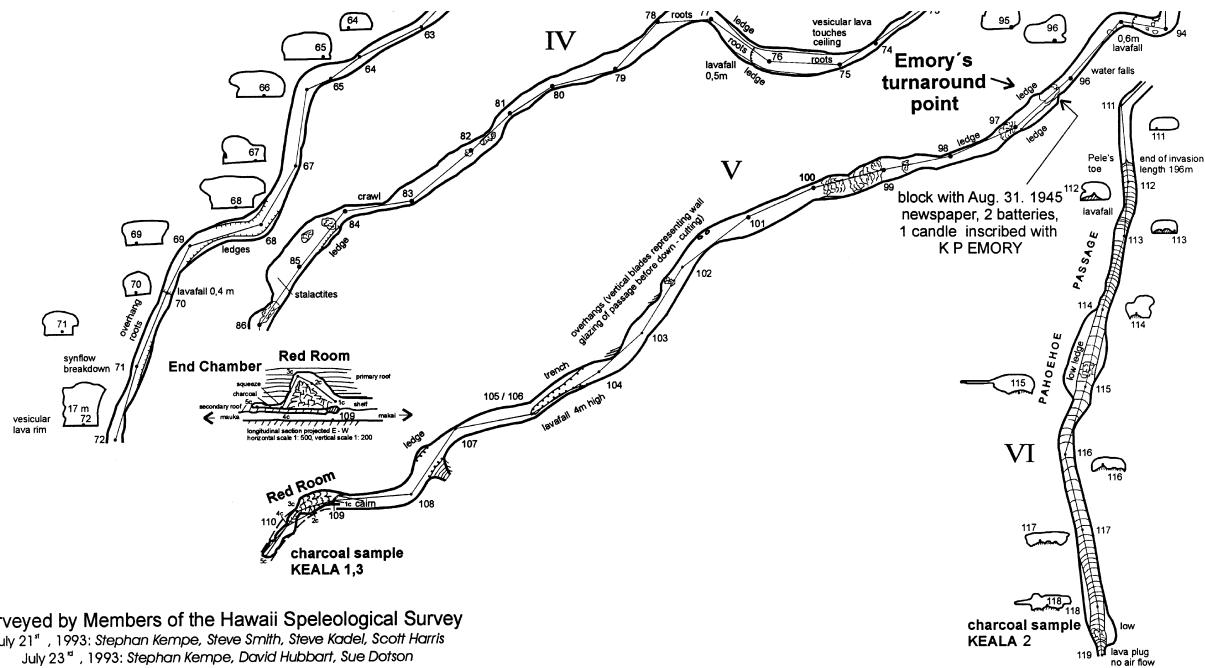
Unexpectedly, charcoal was found even in this remote section of the cave. Our first thought was that it might have been washed in through cracks, but the ceiling does not have wide enough joints to allow passage of sizable chunks of charcoal. This discovery indicates that explorers had not only gone to the very end of Keala Cave, negotiating several vertical lavafalls, but also had climbed up the secondary ceiling and squeezed into this terminal room on their bellies (see Figure 3). The end of Keala Cave is almost three kilometers (2,953 m) from Ladder Puka. Even with modern equipment (shoes, helmets, gloves, head lamps), it takes about one hour for each trip. With *kukui* nut torches and bare heads and hands, the time necessary for ancient Hawaiians probably would have been multiplied tremendously.

After the 1996 determination of the source of the 1945 artifacts, we decided to date the charcoal from the upper end of Keala to determine if it was left by early explorers or by someone in Emory's party (or by someone entering the cave after 1945). K. Allred therefore collected three samples in December 1996: Keala 1 (0.2 g), burnt *kukui* nut, collected ten meters upslope from station 109 in the upper passage; Keala 2 (0.2 g), burnt *kukui* nut fragments, collected near station 119 at the end of the cave, on the black lava intrusion; and Keala 3 (0.4 g), wood charcoal from a large chunk, collected seven meters upslope from station 109 in the upper passage near sample Keala 1.

Because of the small sizes of the samples, they had to be dated by carbon 14 accelerator mass spectrometry ( $^{14}\text{C}$ -AMS). We submitted the three samples to Dr. J. van der Plicht of the Center for Isotope Research of the University of Groningen, Netherlands, at the beginning of February 1997 and received the results in June 1997: Keala 1 (GrA-6989),  $250 \pm 50$  B.P.; Keala 2 (GrA-6990),  $200 \pm 50$  B.P.; and Keala 3 (GrA-6991),  $150 \pm 40$  B.P. “B.P.” denotes years before present—before A.D. 1950—that is, before widespread atomic-bomb testing was conducted.

At first glance these results indeed suggest pre-Emory dates for the charcoal. Yet they seem to be relatively far apart. Unfortunately, the carbon 14 inventory of the atmosphere shows large wiggles in the last three hundred years, making exact correlation of carbon 14 dates with calendar years difficult for this period. Employing cellulose from tree ring-dated wood from Germany, Ireland, and western America, Stuiver and Pearson (1993) have published the best current calibration dates. This curve (Figure 4) is believed to be representative for the northern hemisphere, since carbon reservoir modeling showed that differences in carbon 14 “ages” should not exceed twenty years (Braziunas, Fung, and Stuiver 1991).





Surveyed by Members of the Hawaii Speleological Survey  
 July 21<sup>st</sup>, 1993: Stephan Kempe, Steve Smith, Steve Kadel, Scott Harris  
 July 23<sup>rd</sup>, 1993: Stephan Kempe, David Hubbard, Sue Dotson  
 July 31<sup>st</sup>, 1993: Stephan Kempe, Ole Fulks, Thomas Hargrave

FIGURE 3. Map of the upper part of Keala Cave between the Ladder Puka (Emory's Poi Pounder Puka) and the black lava plug at station 119. Note the area with handprints at station 32, the turnaround of the Emory party at station 97, a four-meter-high lavafall at station 105/106, which can be free-climbed, the beginning of a secondary ceiling upslope from station 109 (Red Room), and the tongue of intruded black lava 196 meters long. Samples Keala 1 and 3 were collected at the upslope side of the Red Room, and sample Keala 2 was collected at the end of the cave at station 119. (Map by S. Kempe)

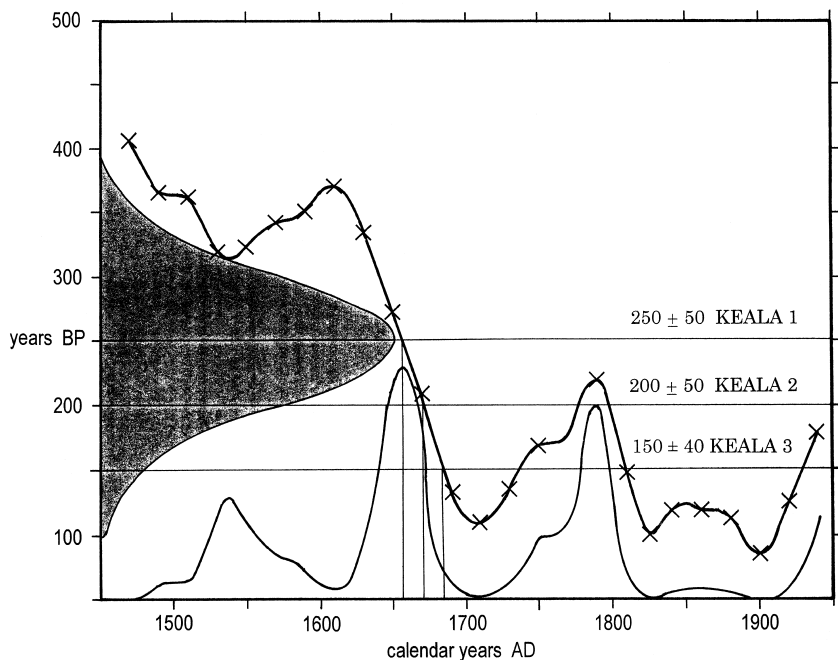


FIGURE 4. Calibration curve (heavy line) between carbon 14 dates (y-axis) and calendar years (x-axis) for the period A.D. 1450 to 1950 (after Stuiver and Pearson 1993). The bell-shaped curve on the y-axis gives the statistical probability of the carbon 14 date for sample Keala 1. The spiky curve on the x-axis depicts the probability distribution that sample Keala 1 dates fall into certain calendar years. The total area under this curve represents a probability of one and is equal to the area of the bell-shaped curve. The horizontal lines mark the intercepts for all three Keala samples with the calibration line. Vertical lines show the most probable period for all three samples. (Graph courtesy Dr. J. van der Plicht, Groningen)

When plotting the three Keala carbon 14 ages onto the Stuiver and Pearson graph, the difficulties in interpreting the dates become readily apparent (Figure 4). Even though the age of Keala 1 corresponds to only one calibration curve point (i.e., A.D. 1660), one has to take the statistical measuring error (1 sigma = 50 years) into account as well. It is shown by the bell-shaped curve on the y-axis. The possible dates for sample Keala 1 range from A.D. 1470 to A.D. 1940, as suggested by the lower curve on the x-axis,

the area of which is equivalent to a probability of one and is the same as below the bell-shaped curve. The most probable dates are centered at around A.D. 1660 and 1790.

Keala 2 is best correlated with three calendar dates, A.D. 1670, 1790–1800, and 1940; Keala 3 to A.D. 1680, 1730, 1810, and 1930 with statistically possible dates covering the last four centuries.

Taken individually, these dates do not tell when the charcoal was deposited. However, if one makes the likely assumption (based on the scarcity of the charcoal) that only one group of explorers visited the remote parts of the cave, then the periods A.D. 1660–1680 and (less probably) 1750–1800 are favored. In these periods the sum of the probabilities of the three ages would be largest. Furthermore, in this period the large difference in the three carbon 14 ages is minimized, because the later part of the seventeenth century is the steepest part of the calibration curve (Figure 4, left).

The statistically favored time of the visit, the years A.D. 1660 to 1680, would be in accordance with Hawaiian history. A population peak occurred around this time, inducing widespread tribal warfare (Kirch 1985). During this time especially, many people would have taken refuge in caves. Keala Pit was an underground fortress, and Ladder Puka (Emory’s Poi Pounder Puka) was used as an underground living area. The motives for explorers to push themselves to the cave’s limits may have been multiple: First, they could simply have looked for an underground escape route. They could have been searching for hidden enemies or hidden enemy bones (to destroy or use their mana). Possibly they also scouted the cave for resources like obsidian (even though we did not notice the removal of glassy parts from the intruded black lava).

The second time period when the three samples converge is the late eighteenth century. This period marks the war of unification of the islands under King Kamehameha I, when cave use and cave exploration might have peaked again.

It should be kept in mind that interpreting the carbon 14 dates in this manner is speculative, and the possibility that the charcoal was left by the Emory party or shortly thereafter cannot be completely excluded. The charcoal certainly is not more recent than 1950 (it is not bomb carbon 14-contaminated). Nevertheless, it is not likely that the charcoal derived from the time of Emory’s visit or later. First, we know that at least one person in the Emory party used a flashlight (plus candles). Second, charcoal is found in almost all parts of Keala, even in those parts that clearly were not visited by Emory. Further, Keala Pit and the Ladder Puka served as living areas during times of war, making it likely that other parts of the cave were explored

simultaneously by Hawaiians. Further, two of the samples are burned *kukui* nuts, traditionally used for lighting by early Hawaiians. Although *kukui* nuts still are in limited use as a lighting source in rural Puna District (O. Fulks, pers. com., 1997), they were largely replaced by kerosene torches early in this century (Brigham 1902). Although petroleum products may have been in short supply early in World War II, kerosene for torches should have been available in Puna by the time of Emory's visit. In fact, burned remnants of such torches have been found in Kazumura Cave.

### Other Artifacts

Apart from the artifacts of Emory's party, the charcoal, and some stones piled up as a climbing aid, another interesting set of artifacts was found on 21 July 1993 in the upper part of Keala: handprints (Kempe and Ketz-Kempe 1997). A set of prints of approximately five hands was noted on the wall upslope from station 32, 720 meters upslope from the entrance. This section of the cave was consequently called "Painted Passage." These positive handprints were made by "inking" the flattened palm with light brown mud that occurs copiously on the walls of the lower part of this section and then pressing the hand onto the dark brown walls of the upper part of the cave wall. It is not astonishing that the resulting prints look similar to the handprints in some of the paleolithic picture caves of France and Spain, where about twenty positive and five hundred negative handprints occur (Lorblanchet 1997). Currently there is no way of telling if the Keala Cave prints were made by prehistoric Hawaiians or by someone in Emory's party, possibly even himself, illustrating "European cave art" to his guides. Since these prints are near to Ladder Puka, it is also possible that they are very recent. K. Allred noticed some burnt *kukui* nuts next to the prints, which could be a hint that the prints are of old age. Emory did not mention these prints in his report, just as he does not mention the charcoal in the upslope section of Keala Cave. He could have simply overlooked them.

### NOTE

We are grateful to Bobby Camara for typed transcripts of the Boundary Commission testimony and for bringing that testimony to our attention. Further, we are deeply grateful to all the members and cooperators of the Hawaii Speleological Survey who made possible the field studies and maps described here. Dr. J. van der Plicht is thanked for the <sup>14</sup>C-AMS age determinations on the charcoal, and Thomas Hargrave helped in pinpointing the exact date of the *Honolulu Advertiser* page found in the cave.

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