

An Archaeological Expedition to Atumpampa Cave in Northern Peru

Roc Pursley and Louisa Hooven

High in the Andes of northern Peru are a number of caves that were used by a culture known as the Chachapoya. This culture is thought to have existed as early as 900 A.D. and thrived until they were conquered by the Inca in 1470 A.D. Research seems to indicate the Chachapoyans were not so much a centralized society but some 22 clans that made up a confederation. The most impressive site attributed to this culture is called Kuelap.

When people refer to Kuelap as the Machu Picchu of the north they are doing it a disservice. It is twice the size and 1000 years older than the more famous site. Perched on the top of a mountain, this site measures 1909 by 364 feet and contains the foundations of some 350 circular structures built with mortared stone. They are arranged on four levels and the whole site is surrounded by a perimeter wall that reaches 60 feet in height. There was more cut stone used in Kuelap than was used constructing the great pyramid of Giza. While all of Machu Picchu is well manicured for the mobs of tourists that visit it, parts of Kuelap retain the look of recently discovered ruins. Trees grow among the tumbled stone walls. Vines, orchids, and bromeliads festoon the vegetation. The stunning views of the steep hills surrounding Kuelap reveal a surprising patchwork of nearly vertical agricultural plots.

The Chachapoya people were revered as healers and known for their impressive stone mausoleums, called *chullpas*. These would be built on ledges in the middle of extremely tall, vertical cliffs. But there was an additional facet of Chachapoyan culture that, until recently, had not been known. Building on the previous explorations of



At work in Atumpampa

Steve Knutson and associates (see *NSS News* February 2006) an expedition was organized to more formally study the Chachapoyan use of caves, particularly as places for interring their dead.

Academic confirmation of this fact would be groundbreaking since all previously studied sarcophagi and *chullpas* had been discovered in cliffs, not underground. The expedition was directed by Peruvian archaeologist Dr. Sonia Guillén, director of the Museo Leymebamba and Centro Mallqui. Dr. Guillén had been informed by Knutson of the presence of large numbers of human bones in the caves he had been

recently exploring. Thus, in July of 2007 a joint American and Peruvian team of cavers and archaeologists set out, on horseback, to Atumpampa cave. The group included NSS members Steve Knutson, Dr. P. Willey, Dr. Louisa Hooven, Scott Linn, and Roc Pursley. Rosío Díaz Ruiz, Flor Cachay and Rocio Paz Sotero made up the Peruvian contingent. Anthropology students Karen Smith Gardner and Andres Kruppl completed the team.

ATUMPAMPA

Most of the caves in this part of Peru are called *tragaderos*. This refers to a cave with a vertical entrance, often with a water source flowing into it. While they may become very deep it is not uncommon for them to have little or no horizontal passage. If one is lucky and can access the stream level, they can run some distance and will sometimes connect with other nearby *tragaderos*. Cueva Atumpampa, as well as many of the others we investigated, is different. Atumpampa is a mile-long cave with minimal vertical extent. For most of its length, the single 40-foot-wide passage slopes, often steeply, from the side walls downward to the center. There is evidence of ancient pathways that run along the walls. In several places calcite-rich pools fill the usually narrow, central area. The average ceiling height is 25 feet. The twilight zone of the cave floor is littered with rocks from the constantly spalling ceiling. This long wide passage ends suddenly with a massive breakdown pile. There is one small crawlway

Atumpampa Camp





evening, bats darted from the cave opening.

While work at Atumpampa was the archaeologists' primary focus, there were other caves in the area that needed to be explored and mapped. But before setting out to explore, Knutson and Linn set mapping stations; these stations were also used as datum points for the archaeologists. Knutson and Linn were able to find and investigate three other caves in the immediate area: Stonehenge, Stonehenge II, and 3 Skulls. These caves were small, but also found to contain human remains and ceramics. They were later briefly examined by Rosio and Rocio and added to the list of things that they did not have time to study. It was a rather long list. There are about 500 known archeological sites in the Peruvian state of Amazonas and not a lot of funding for archaeological projects. (At one point it was asked if there was a map with all of these sites on it. Currently the best map has only 80 percent of them.)

Curibamba is another nearby cave containing cultural and human remains. It also had been visited earlier by Knutson. This cave was a 3 hour hike distant and with so much found in and near Atumpampa it was only visited and photographed. However it impressed the Peruvian archaeologists because of the quantity of remains in it.

A NEW DISCOVERY

Following a tip from a local, yet another cave was visited. Muyucsha is a short through cave about an hour hike from Atumpampa. It is hidden in one of the many thickets of dense fern and vine-filled jungle which are dotted about this rolling highland pasture. The eastern entrance had a low wall across it, similar but smaller than the one at the entrance of Atumpampa. In addition, there were several stacked stone terraced areas along the sides of this cave. The silty floor showed signs of water flowing through and pooling in places. This cave contained two important finds.

The first was an almost intact Chachapoyan ceramic vessel. Finding intact pottery is somewhat rare. Looting archaeological sites for the antiquities market is a HUGE problem in Peru and results in the permanent loss of much information. We found it interesting that this vessel was

placed in a side passage under some soda straws that would have dripped into it while they were growing. While there were active formations in this side passage, the straws directly above the pot were now inactive. Very near was a large column that was broken off and missing. It had been about 6 inches in diameter and 10 feet tall. An 8 inch long stalactite was actively growing down from the upper stump. Both of these features have been found in Central American sites where cave water was collected and formations were removed for use in aboveground shrines and elite burials. It will be interesting to see if future research suggests that the Chachapoyans collected cave water for similar reasons.

Muyucsha contained the most significant find of the expedition. Near the unwallled entrance was an intact Chachapoyan platform burial. This is specifically important because it had the only sarcophagus still containing its mummy ever found. The very first! A crack in the side of the mud and fiber exterior provided a glimpse of the textile wrapped mummy interred within. The platform was built on a natural ledge about 12 feet off the floor of the cave. The ledge had been made larger by adding a wooden pole in front. Flat rocks spanning the gap from the front of the ledge to the pole were then put in place. The rocks supporting this addition were literally an inch away from slipping off the pole they were perched on.

For the archaeologists to safely photograph and sketch this site they needed to have a work platform built. A local rancher, Manuel, was hired to assist Pursley with this side-project. Poles were cut from the jungle then lashed together and braced against the cave walls and ceiling. We ended up with a 10-foot-long, 3-foot wide work space that was slightly higher than the level of the platform. Linn and Knutson mapped this cave as well, allowing the archaeologists to focus on their work. Besides the intact sarcophagus

there were two more that were broken but still seemed to contain partial mummies. They were surrounded by mounds of human bones. There were at least 30 skulls in the mounds. With financial assistance from the NSS, a subsequent expedition was mounted to recover the sarcophagus for study and conservation.

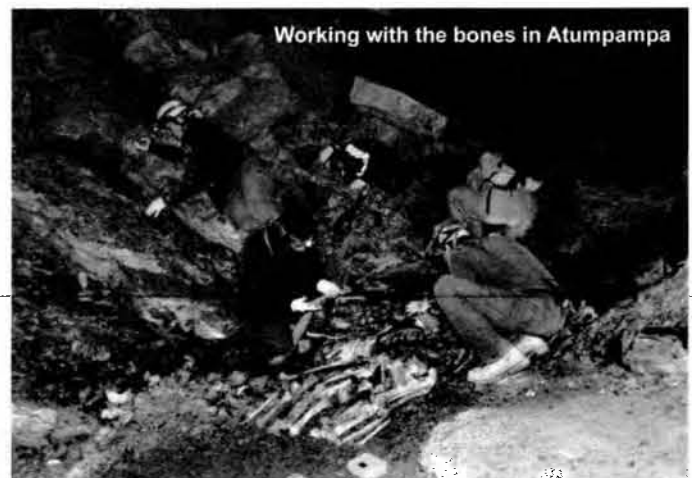
Just two days before we were to leave, Manuel informed us of another cave in the area. This unnamed cave also contained human remains, three styles of ceramics, and a couple of large ground stone bowls. One bowl was intact, another first, but too heavy to retrieve at this time. The archaeologists were impressed with the contents of this cave but did not have time to do more than visit, photograph and add it to the list.

HISTORY CHANNEL

Another interesting facet of this expedition was the filming of some of our work by a team from the History Channel. Dr. Guillén had contacted them while she was putting the project together. Hunter Ellis and his crew from "Digging for the Truth" arrived at camp late one rainy night. While we had taken horses on the steep and muddy trip up from San Carlos, they had elected to walk. Although they were soaking wet and exhausted after their six-hour slog, they got up bright and early and filmed nonstop the next day. If you happen to catch a rerun of the "Mummies of the Clouds" episode you will be able to watch interviews with Karen Smith Gardner and get a video taste of what Cueva Atumpampa is like. This episode is also available via the History Channel Web site. After interviewing Dr. Guillén at her museum in Leymebamba, the film crew also visited some of the mid-cliff tombs. This program gives one a chance to see the outrageous rappelling potentials that exist in Peru.

THE LOCAL COMMUNITY

The local muleteers came to retrieve the history channel and their gear. With them came the mayor, and several teachers



from the local community of San Carlos. We were scheduled to come back to San Carlos the next day, and they invited our team to come to dinner. We were treated to a feast of chicken, cui (guinea pig), potatoes, rice, and a wine made from sugar cane juice. After our dinner, we met in city hall to brainstorm about ideas for tourism in San Carlos. Improving the trail to Atumpampa is a priority for the community, and they are interested in conserving the cave as a resource so that others may enjoy it, and to revere those interred in the cave, likely their forebears.

TWO MORE CAVES

Following the work at Atumpampa three of us visited a town called Lamud to see the caves that are nearby. The first two were commercial, which means simply that they were gated—no lighting or paths provided. Our guide had a key to the first which contains many very nice formations. Human remains poked out in the stream channel of this muddy-floored cave. Our guide had the wrong key to the second and we could not get in but a farmer said there was yet another cave nearby. This was a smaller version of Atumpampa; steeply sloping floors with old trails on the sides, stream in the middle after breakdown in the twilight zone, human and animal bones. Twelve left femora were identified. Linn found lots of pottery shards and an interesting bone implement. Hooven came across a fossilized shell with a hole drilled in it. These were all left where they were found. This cave would have required chest-deep immersion in the stream channel to continue so we don't know how it ends ... yet. We informed Rocio of our finds. This cave also went on the list as one more item to add to the unfinished map of unexcavated sites.

IN CONCLUSION

The expedition was remarkably successful in many ways. It was the first attempt to study Chachapoyan cave usage and confirmed that they used caves for mortuary purposes. It indicated that not just the twilight zone but also the dark zone were actively used. Additional unknown archaeological cave sites were identified. Several very significant artifacts were recovered and are now on display in the local museums. But perhaps most importantly it was a fine example of the contributions we cavers can make to the field of archaeology. The discoveries we make while underground can be significant. If we treat artifacts with the same "take nothing but pictures" attitude that we apply to speleothems and cave critters, then we can truly aid in expanding the knowledge of human prehistory. Unfortunately the work cannot happen fast enough.

LETTERS

CLARIFICATION OF TERMINOLOGY ABOUT PHOTO SLAVES

Dave Bunnell has started an excellent series of articles on the Digital Underground. In the August issue, he talked about the Flashwave-3 Radio Slaves. Despite my being the distributor of Firefly Slaves (2 & 3) for cave photography, I do have and occasionally use a Quantum 4i Radio Slave I picked up on eBay. In fact, during a post Colorado Convention photo workshop I taught at Carlsbad Cavern, I would have given anything to have more radio slaves. Flashes set off by cameras over 1000 feet away in The Big Room would false trigger the Firefly Slaves I was using to the point of ruining all intentions of my getting a flash-lit photograph! Darned inconsiderate of those tourists...

In the article, Dave refers to Firefly and Wein Slaves as being "optical slaves." This is partially true in that it triggers from a portion of the electromagnetic spectrum associated with light (as opposed to much longer radio frequency wavelength), but neither the Wein nor the Firefly use visible light as their trigger. In the general nomenclature of types of slaves for remote triggering, an "optical slave" is usually one that responds to visible light. The Wein and Firefly slaves respond to the infrared (IR) portion of the spectrum, just outside the realm of what we can see with our eyes as visible light. As such, they are referred to as infrared slave units, not optical slaves.

Usually the cheaper the price for a slave, the more likely it is that it responds to visible light, not infrared, and is therefore called an "optical slave." Anyone who has bought a less expensive slave for cave photography quickly finds out that the slave must be pointed back towards the on-camera flash to trigger at all and the distance must be very close to the slave for it to "see" the flash from the camera and thus trigger the remote flash. Part of the reason for optical slaves failing so easily at longer distances is that the intensity of visible light falls off dramatically the farther you are away from the source. It follows the rule of the inverse of the distance squared: $I(n) = 1/D(istance)^2$. This means if you double the distance, you get only 1/4 of the amount of light. Triple the distance (X 3), you get only 1/9 the amount of light and so on.

The key to the high sensitivity of the infrared type slaves is the type of sensor and the circuit in which it is used, especially the use of a high pass filter. This is the reason why the Firefly, based on David Gibson's design, and to a lesser extent the Wein, are more sensitive than lower cost optical slaves.

In addition, their sensitivity is based on sr but sudden changes in the IR light level, namely the flash from your on-camera flash.

There are some disadvantages to radio slaves in comparison to infra-red type slaves.

1. they do not work very far around corners because radio waves do not reflect much off cave walls (unlike infrared), so they are a line of sight device really.

2. you need a transmitter and receiver.

3. they must be switched off after use or the batteries drain quickly. The Firefly runs at such a low standby current (<10uA) that it is on all the time with a battery life of years and can be sealed up and forgotten about.

Infrared slaves are, in one sense, a perfect trigger for cave photography. If used on the surface or in a house where there is already considerable IR light (either from sunlight or fluorescent bulbs), their sensitivity diminishes considerably. With so much light, it is hard for the slave to pick up the small changes caused by the on-camera flash going off. Take it underground where there is virtually no IR light (usually only that from your headlamp) and their sensitivity increases dramatically. Any flash from a camera strobe, even a very weak one, will cause an IR-based slave to trigger. That's why my slaves were being triggered so easily by flashes from nearly 1000 feet away in Carlsbad Cavern. In reality, they were doing the job they were designed to do, albeit not to my liking.

As Dave described in his article, you are not at the mercy of other peoples' flash on your photo trip if you are using a dedicated radio slave. There are certainly many reasons to use them and I advocate using them in appropriate settings. As such, my intention here is only to clarify how Firefly and Wein slaves operate.

Peter Jones

Shot in the Dark Cave Photography

[Ed. Peter is quite right to distinguish optical and infrared slaves as two different types. However I take exception to his statement above that radio slaves are a line-of-sight device. As a test I successfully triggered a flash 600 feet away with brick building in-between transmitter and receiver. Whether radio waves reflect from cave walls as well as infrared waves may be a moot point, as a flash placed around several corners of a passage may not show up in one's photo anyway. In any event I've yet to see one of my radio slaves fail to trigger underground because it was around a corner, behind a rock, or not line-of-sight with the transmitter.]