TRENCHING IN SEARCH OF ANCIENT SILENCIO PHASE FOOTPATHS

Errin Weller
Department of Anthropology
University of Colorado, Boulder

RESUMEN

Mediante la combinación de imágenes satelitales de alta resolución, reconocimiento de campo y excavaciones, se ha establecido una metodología para la localización y confirmación de senderos antiguos. La investigación arqueológica en el área de Tilarán, Guanacaste, ha descubierto numerosas anomalías lineales en el paisaje, que evidencian procesos naturales, actividades históricas y movimiento de personas en tiempos prehistóricos. Utilizando líneas de evidencia independientes que incluyen el entender los procesos de formación de senderos antiguos, presencia o ausencia de artefac - tos y la localización topográfica de las anomalías, el Proyecto Prehistórico Arenal localizó una red de senderos antiguos de la fase Silencio (600-1300 d.C.). Esta metodología podría ser aplicable, con modificaciones, a otras regiones del mundo.

ABSTRACT

Through the combination of high-resolution satellite imagery, survey, and surface excavation, a methodology has been established for the location and confirmation of ancient footpaths. Investigation in the Tilaran area of Guanacaste has discovered numerous linear anomalies on the landscape which are the remains of natural processes, historic activity, and prehistoric movement. Utilizing independent lines of evidence including understanding the formation of ancient footpaths, presence or absence of artifacts, and the topographic loca - tion of linear anomalies, the Proyecto Prehistorico Arenal located a network of footpaths. This methodology may be expanded, with modifications, to other regions on the world.

Errin Weller *errin.weller@colorado.edu*

The Proyecto Prehistorico Arenal is combining the use of high-resolution satellite imagery from the satellite IKONOS with surface examinations and excavations in order to locate ancient footpaths of the Silencio phase (ca. AD 600-1300.) The remote sensing data have revealed linear anomalies that may be the remanents of ancient footpaths. Therefore, it is necessary to conduct excavations to verify if these features are the remnants of prehistoric activity. Three possibilities for the interpretation of the anomalies exist: 1) they are prehistoric in origin; 2) they are the natural result of erosion or faulting; or 3) they are historic or modern cultural features. To differentiate between these possibilities, it is necessary to utilize independent lines of evidence to establish a methodology for the identification of ancient footpaths, including "*topographic positions, locations relative to known loci of prehistoric activity, associated artifacts, and stratigraphic profiles across the paths*" (McKee *et al.*, 1994: 153).

FOOTPATH FORMATION

To fully understand how ancient footpaths are identified, it is essential to understand the processes affecting the formation of footpaths. These features formed as a result of human behavior; repeated use of a pathway that initiated erosion on the landscape (McKee *et al.*, 1994: 147). The activity of walking wore down through the stratigraphic layers, even into the clay Aguacate formation, leaving a signature broad U-shape in cross-section. After discontinued use, the depression filled in, stabilizing and preserving it for future archaeological detection. This footpath formation—and the degree of erosion—are affected by a number of factors: 1) rainfall: intense and uneven rainfall, characteristic of this region in Costa Rica, increases the potential erosion; 2) slope: in general, an increase in slope will increase erosion, meaning low lying or flat areas experience little erosion and have a slight chance of footpath formation; 3) soil properties: the volcanic tephra has low cohesion which increases erosion while allowing moisture to move through quickly; the clay-rich Aguacate is more stable because of increased cohesiveness but moisture moving through the tephra layers quickly erodes the clay; and 4) vegetation: increasing cover can decrease erosion (McKee *et al.*, 1994: 151). To determine the amount of use experienced by a footpath, it is first necessary to control for the above variables, which is beyond the scope of this paper.

LINEAR ANOMALY FUNCTION

An understanding of footpath formation in combination with the following categories of evidence makes it possible to infer the function of an anomaly.

1. Erosional features occur on the steepest slopes and require a catchment area for the water (McKee *et al.*, 1994: 145). Footpaths, by contrast, often follow high ridges and are relatively straight.

2. Stratigraphy: The signature of a prehistoric footpath is intact Unit 20 with evidence of disturbance in the underlying Units 40/41. Disturbance in this tephra layer indicates ancient people were crossing the landscape and the erosion associated with this activity often wears into the Aguacate formation. By contrast, when strata are following natural topography and disturbance is only present in Unit 20, which was deposited just before the Spanish arrived in the New World, this is a sign of historic activity such as an ox cart road.

3. Artifacts and the association of footpaths with cultural features such as ancient villages and cemeteries suggest they were prehistoric and the result of cultural processes.

In summary, the ash layers provide chronology, the stratigraphic profiles reveal a characteristic broad U-shape resulting from use, and the location of the anomaly on a high ridge or in association with cultural features provide evidence of a prehistoric footpath.

The following section summarizes the results of on-the-ground excavations of anomalies (Figs. 1 and 2). I will then discuss the processes that formed these anomalies, including ancient activity, modern practices of fence-line cleaning and laying pipelines, and historic ox-cart roads used for sugarcane transportation. I conclude by suggesting ways to aid in identifying footpath and non-footpath aspects on satellite imagery.

DESCRIPTION OF EXCAVATIONS

TRENCH 44

Excavated 6 June 2002, Harry Jenkins' land, northeast section south of confirmed Silencio phase footpath (AD 600-1300) to the southeast of Trench 17. Trench 44, measuring one meter by four meters, was placed to test Spur 1. Spur 1, an anomaly first identified on Color Infrared (CIR) and IKONOS imagery, was a depression running

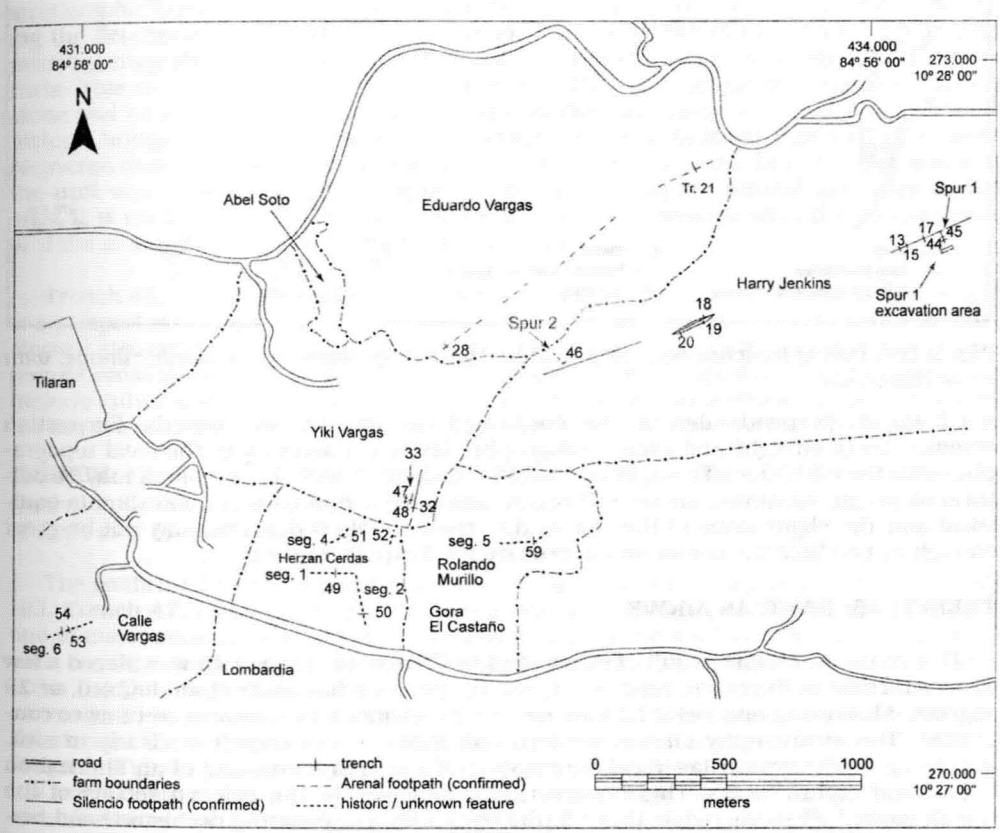

Fig. 1 *Location of trenches on a map drawn from non-georeferenced satellite image, with some distortion.*

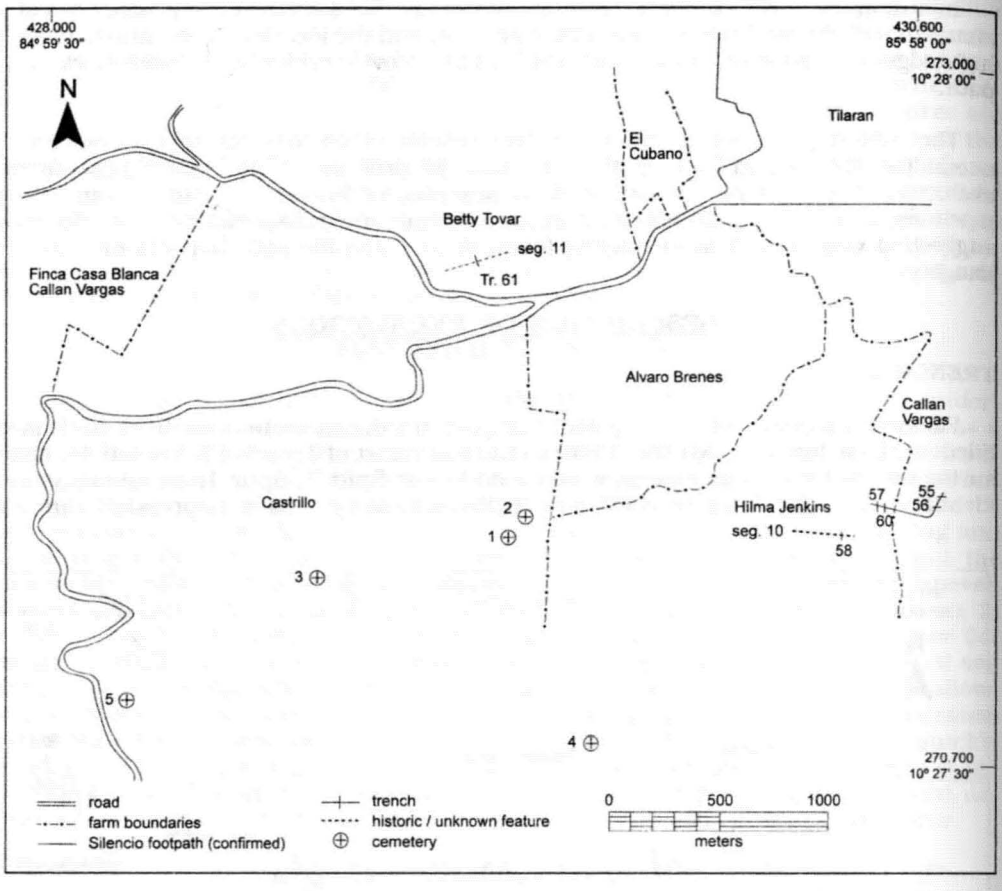

Fig. 2 *Location of trenches on a map drawn from non-georeferenced satellite image, with some distortion.*

north-south, perpendicular to the confirmed Silencio phase footpath. Excavation revealed fairly straight and even stratigraphic levels conforming to the local topography, with the exception of a slight indentation present in Unit 40/41 which may be cultural in origin. However, the overall conclusion is that this trench excavation is equivocal and the slight slope of the hill at this trench, only 9 degrees, may not be great enough to produce the conditions necessary for footpath erosion.

TRENCH 45: SAME AS ABOVE

Due to the uncertain result of excavation in Trench 44, Trench 45 was placed a few meters further to the north, on Spur 1, where the slope has more than doubled, at 20 degrees. Measuring one meter by four meters, excavations in this area were more conclusive. The stratigraphy on the western one meter of the trench is clearly in situ, appearing in the typical layer-cake formation of the area consisting of an alternation of soil and tephra layers. This observation is repeated in the eastern section of the trench as well. However, while Unit 20 (the tephra layer separating prehistoric and historic time periods) is clearly intact through much of the trench, the central section of the excavation differs significantly. The profile reveals a mixture of Units 40/41 with

Unit 50 and limited amounts of 50 that dips into intact Unit 50. This mixture and erosion is the signature of a footpath used in pre-Columbian times. Intact Unit 55 underlies Unit 50, indicating the erosion did not reach this depth, and that path use postdates the emplacement of Unit 55 approximately 600 BC.

Converging lines of evidence support the conclusion of Spur 1 as a prehistoric footpath. First, the archaeological evidence that consists of mixed soil layers in the area of the trench where the depression is present. Furthermore, this mixed soil was eroded from above and deposited into the Unit 50 soil below. The locale, perpendicular to a confirmed footpath, and the observation that the feature runs in a straight direction up and down the slope also supports the assertion of Spur 1 as a secondary footpath. However, use of the footpath did not erode into underlying Unit 55 or the Aguacate formation layer, suggesting the path was utilized less frequently than a primary path which exhibits more striking patterns of erosion.

TRENCH 46: 10 JUNE 2002, YIKI VARGAS' FINCA

To further investigate the nature of spurs connecting to confirmed footpaths, Trench 46 was placed on Spur 2. In a one by four meter trench, excavations uncovered only a partially intact Unit 20 (Fig. 3). This layer, while present at the edges of the trench, begins to slope inwards at the top and then disappears completely. Each of the stratigraphic layers slopes inwards towards the center of the trench (the area matching the depression observed on the surface). The disturbed nature of Unit 20 (largely missing) suggests this feature was the result of historic activities, likely a path for ox carts. This is further supported by the locale of the spur: in direct alignment with a stone and concrete construction at the base of the hill, likely a ruined support for a historic bridge across the stream. Two ceramic sherds (Isolated Finds (IF) #1) were recovered near the disturbed area in the trench (probably below Unit 20, but much of the unit was missing), adding support to the conclusion of cultural activities in the area. It is unclear whether the sherds are in actual association with the ox cart road or if the association is merely the result of chance.

Trench 46, at a slope angle of approximately 18 degrees, illustrates that first, angle is an important component in the formation processes needed to produce the archaeological signature for a footpath. Secondly, the methodology of the project, combining remote sensing techniques with subsurface excavations, is applicable not only to prehistoric cultural features, but also to historic anomalies. In addition, it demonstrates the importance of verifying on the ground what has been observed in imagery.

TRENCH 47: 11 JUNE 2002, YIKI VARGAS' LAND, "TOM'S HILL" *(between the Quebrada Cabra stream and the Rio Santa Rosa), center of south side of hill and west of confirmed Silencio phase path*

The confirmed footpath has been traced to an area informally referred to as Tom's Hill. Trench 47, measuring one by four meters, was placed on this hill to investigate one of many anomalies identified on imagery and on the surface. The confirmed footpath runs the length of the slope before separating into two paths near the base that cross the Quebrada Cabra stream. To the west of this confirmed footpath is another anomaly: an indentation that runs from the center of the hill almost to the base near the stream. Excavation conducted with Trench 47 confirmed this feature as an ancient footpath (Fig. 4). The stratigraphy of the trench is minimal and straightforward. The top level consists of a dark gray to black soil with a high organic content, which was identified as a tephra enriched soil horizon, and the second level is Aguacate. In the central portion of the trench, in accordance with the depression apparent on the surface, the tephra layer has clearly worn into the Aguacate, signifying a footpath.

However, the lack of a distinct Unit 20 (pieces of Unit 20 as well as Units 40/41 are observed in the enriched horizon) makes dating difficult. Three ceramic sherds (IF #2), appearing to be prehistoric in origin, were also encountered in the Aguacate level of the trench, further reinforcing this as a cultural feature.

TRENCH 48: 12 JUNE 2002, YIKI VARGAS' FINCA, SOUTH OF QUEBRADA CABRA

An excavation one by four meters, Trench 48 was positioned to further explore the newly confirmed footpath on Tom's Hill as it crosses the Quebrada Cabra stream. Due to the lessened slope, 10 degrees, the preservation of tephra levels increases. However, this increase in preservation is accompanied by a decrease in erosion necessary for the indentation and preservation of footpaths, making detection more problematic. While the stratigraphic levels in the trench are not entirely clear-it is difficult to make delineations between strata-it is apparent that Unit 40/41 is uniform. The lack of disturbance does not support the interpretation of trench 48 detecting a footpath, as each layer is relatively flat and intact. Two conclusions may be drawn from this excavation: 1) either the depression observed on the surface is not cultural or 2) the inclination is too slight to produce the conditions necessary for footpath formation.

TRENCH 49: 14 JUNE 2002, HERZAN CERDAS' FINCA, CENTER OF THE FINCA

A linear anomaly, designated Segment 1, was observed on CIR and IKONOS imagery running the length of a pasture on the top of a ridge. Trench 49, measuring one by four meters, was placed to investigate this anomaly and in the hopes of discovering continuations of the paths confirmed on Tom's Hill and continuing into the low lying basin land beyond. However, this anomaly is unequivocally modern in origin as it uncovered a pipeline (one inch PVC) for cattle watering troughs (Fig. 5). Interestingly, a large triangular stone worked on three faces was encountered lying next to the depression, which originally suggested prehistoric origins.

TRENCH 50: 17 JUNE 2002, HERZAN CERDAS' FINCA, NORTH OF THE PORTON

Trench 50, measuring one by four meters, was opened to study an anomaly named Segment 2 running parallel to an old fence line. The stratigraphy in this excavation unit is completely natural, following the topography. The depression formed after the formation of Unit 20, indicating it is recent in origin. Units 20, 30, 40/41, and 50 are intact through the trench. Therefore, the trench is not a prehistoric footpath. The depression is the likely result of an old barbed wire fence line that was removed many years ago. This is reinforced by multiple lines of evidence: 1) the observed stratigraphy, 2) the continuation of the line on Ikonos imagery to the north where it meets a fence, offsets to the east, and continues straight, and 3) the very slight slope (only 6 degrees of inclination) has, in past excavations, been revealed to be too slight to archaeologically observe footpaths, yet this line was clearly observed through very low lying areas. The years of cleaning vegetation away from the fence line, so that field burning during the dry season would not burn the fence posts, can result in a long linear depression that resembles an ancient footpath in the imagery.

Trench 50 indicates that a well-cleaned fence line, one repeatedly cleared over many years with the use of a shovel or a machete, can form a depression visible both on the ground and in imagery. This process has been identified by ranchers in the area and was also observed on the nearby land of Callan Vargas, who testified that shovels, or occasionally machetes, are utilized in the dry season to keep fence lines clear of grass prior to burning. This activity results in a previously unknown formation process that can give all of the indications of a prehistoric footpath. Future research must take this into account when examining anomalies and in determining where to place excavation units.

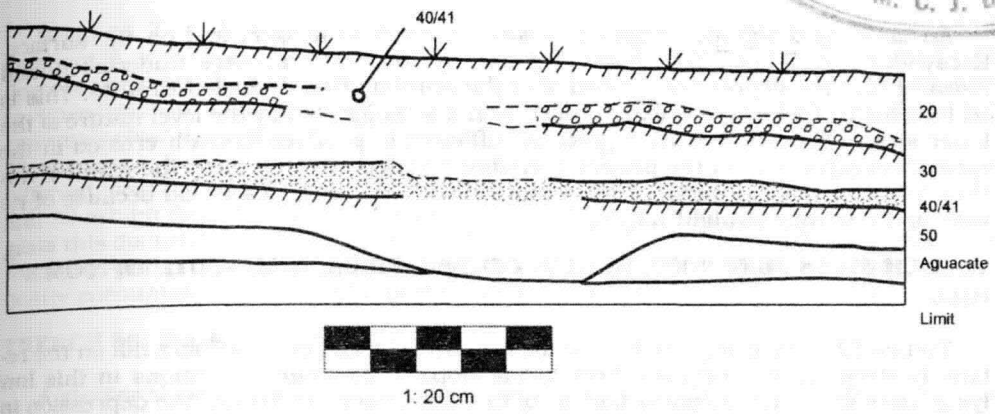

Fig. 3 *Trench 46 profile*

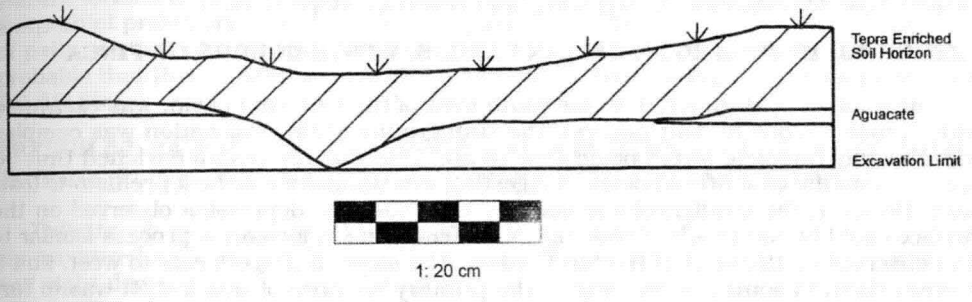

Fig. 4 *Trench 47 profile*

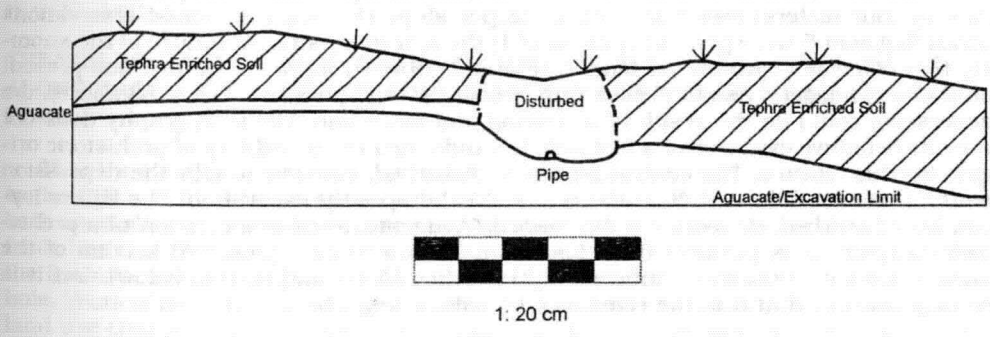

Fig. 5 *Trench 49 profile.*

TRENCH 51: 18 JUNE 2002, HERZAN CERDAS 'FINCA, SOUTH OF YIKI VARGAS' FENCE LINE AND EAST OF THE PIPELINE

An anomaly designated Segment 4 was apparent in imagery and on the surface. Excavations in Trench 51, measuring one by four meters, were undertaken and revealed that the depression formed after the eruption that deposited Unit 20. This is an indication of a historic origin, a conclusion also suggested by the level nature of the lower strata. The slope of 13 degrees is sufficient to produce footpath erosion in the excavation experience of the project, therefore this depression is likely the result of natural processes, a cow path, or what is most probably an ox cart road because of its wide and relatively straight nature.

TRENCH 52: 18 JUNE 2002, HERZAN CERDAS' FINCA, HILL SOUTH OF TOM'S HILL.

Trench 52, measuring one by four meters, was placed south of Tom's hill on the relatively steep (22 degrees) southern facing slope to continue excavations in this low lying basin where no footpaths had, as of this date, been confirmed. The depression in this area was excavated to Aguacate and it is evident that the feature formed after the tephra layer was deposited. Furthermore, the overburden in this trench had Aguacate inclusions, indicating erosion as Aguacate washed down the slope. This erosion is the likely result of overgrazing of cattle by earlier property owners. The anomaly evidently formed from deforestation, overgrazing, and resultant slope erosion.

TRENCH 53: 19 JUNE 2002, CALLAN VARGAS, WESTERN EDGE OF FINCA

Linear anomaly Segment 6, to the south west of the low-lying basin, was excavated with Trench 53 (one by four meters). The stratigraphy of this excavation was complex with the only complete layers being Unit 20 and Unit 60. The tephra enriched Unit 30 does dip into the Unit 60 soil below, suggesting this anomaly may be a prehistoric footpath. However, the stratigraphy is not very clear and the depression observed on the surface could be the result of clearing an old fence line (a formation process similar to that observed on the land of Herzan Cerdas). The slope, 3 degrees east to west, and 5 degrees north to south, is very slight. The primary purpose of this trench was to further understand the stratigraphy in this area.

TRENCH 54: 19 JUNE 2002 (LOCATION ADJACENT TO ABOVE)

To further examine if Segment 6 is a remnant of a prehistoric footpath, Trench 54 (one by four meters) was placed on a steeper slope (11 degrees). Initial reservations about Segment 6 were present because of 1) the extremely straight nature of the anomaly that coincided with an old fence line and 2) how strongly the feature was present on IKONOS imagery. As is the case with Trench 50 (and possibly Trench 53 above), the depression could be the result of a clearing of a fence line. The stratigraphy does not provide definitive evidence of a footpath, but indicates the possibility of prehistoric origins for this feature. The central section is disturbed, consistent with the depression on the surface, while Unit 20 remains intact and drapes the excavation. The tephra layers, also disturbed, do exhibit a dip towards Aguacate, another indication of a prehistoric footpath. It is possible that this anomaly is a weakly preserved section of the ancient footpath that was confirmed by Trenches 55-57 and 60 (see below), but it is equally possible that it is the remains of a historic fence line.

TRENCH 55: 20 JUNE 2002, CALLAN VARGAS' FINCA, WESTERN EDGE OF FINCA, ADJACENT TO HILMA JENKINS' FINCA

Segment 7, a depression running in a southwesterly direction to the west of Segment 6, was excavated by Trench 55 (one by four meters). The slope is gentle (6 degrees north-south, 3 degrees east-west) and the primary purpose of this trench was to investigate stratigraphy, which was observed in abundance. The levels were extremely clear, as seen on the profile. Of particular interest is the large amount of Unit 55, a volcanic layer, observed in this area of excavations. This may be an indication of different localized conditions when the volcano Arenal erupted c. 600 BC. Units 40/41 and 30 exhibit disturbance and when combined with the intact nature of Unit 20, suggests this disturbance took place in prehistoric times. A ceramic sherd (IF #3) was also recovered and provides continuing evidence of a cultural connection. This trench evidently encountered evidence of a prehistoric footpath.

TRENCH 56: (SAME AS ABOVE)

A steeper slope was selected for Trench 56 to uncover more definitive evidence of a prehistoric footpath. A mixture of soils from Units 50 and 60 has clearly dipped into the Aguacate in the central section of the trench, a signature of a prehistoric footpath (Fig. 6). The edges of the trench, by contrast, follow the natural topography. Furthermore, Unit 20 is evident across the entire length of the trench, indicating this feature formed in Precolumbian times. Trench 56 further confirmed Segment 7 was a footpath of prehistoric origins. The stratigraphy indicates the disturbance, in the form of path use and resulting erosion, occurred prior to the Silencio phase path, and it is probable that this trench has detected a footpath in use during the Arenal phase, 500 BC-AD 600.

TRENCH 57: 24 JUNE 2002. ON RIDGE TOP IN SOUTHEAST CORNER OF HILMA JENKINS' FINCA, JUST WEST OF BOUNDARY WITH CALLAN VARGAS' FINCA.

This trench was excavated into Segment 9, a westward continuation of the anomaly excavated by Trenches 55 and 56. It is one by four meters, at the juncture of four and eight degrees of slope. Stratigraphic preservation was very good, essentially identical to Trench 55, indicating confirmation of the same anomaly as a footpath. One sherd was found in Unit 50, and four other sherds were found in the earlier Unit 60 paleosol, lending strong support to the interpretation that the footpath confirmed by these trenches dates to the Arenal phase. This trench was fenced and left open to be observed when the Museo Nacional de Costa Rica archaeologists came to visit. It was then backfilled.

TRENCH 58: 24 JUNE 2002. IN THE SECOND PASTURE WEST OF TRENCH 57, ALONG BROAD RIDGE TOP, IN SOUTHEASTERN CORNER OF HILMA JENKINS' FINCA.

This 1 x 4 meter trench was excavated into two thin, straight anomalies discovered in the CIR and IKONOS imagery, where they crossed. The stratigraphy indicated that both anomalies were recent, with the stratigraphic characteristics of an old barbed wire fence line (Fig. 7). That was confirmed by the finding of an iron staple used to attach the fence to a post, a fragment of an old style of barbed wire itself, and a fence post-hole. Years of fence line cleaning, probably in the middle part of the 20th century after land use changed from sugarcane cultivation to dairy cattle ranching, is what created these linear anomalies.

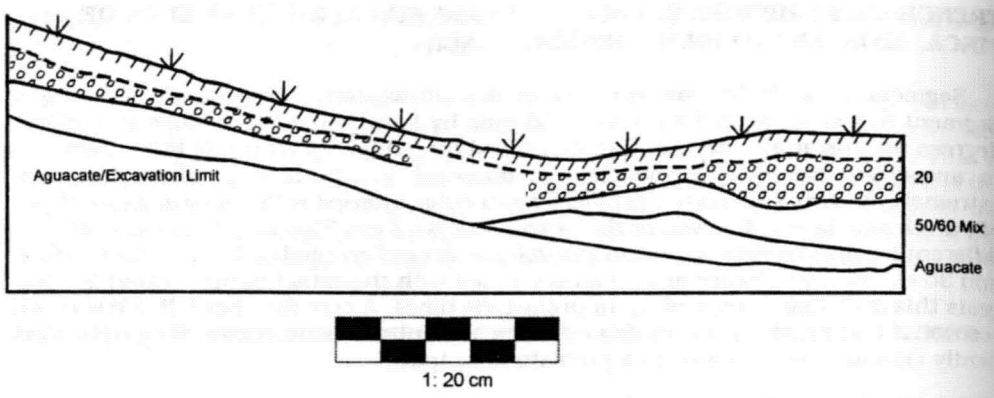

Fig. 6 *Trench 56 profile.*

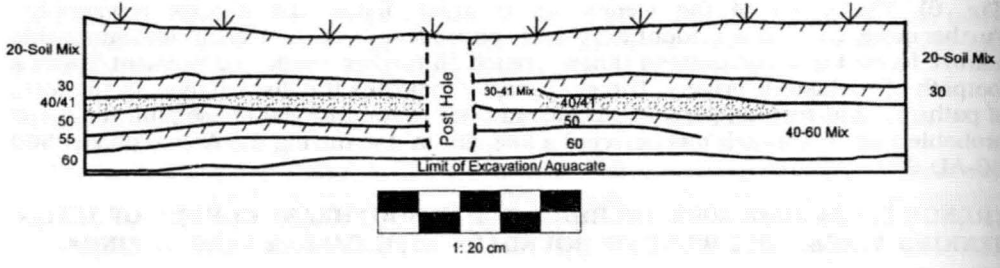

Fig. 7 *Trench 58 profile.*

TRENCH 59: 25 JUNE 2002. IN THE FINCA GORA EL CASTAÑO, OF ROLANDO MURILLO, NEAR RIDGETOP ALONG NORTHERN BOUNDARY OF HIS FINCA.

This 1 x 4 meter trench was excavated into a gently curving anomaly that runs east-west along the length of the pasture that forms the northernmost portion of the finca. The slope is 6 degrees along the anomaly and also 6 degrees in cross-slope. Stratigraphy is completely natural, unaffected by any detectable human activities prior to the emplacement of Unit 20. The Unit 20 is eroded by the activity that formed the anomaly, and it is clear that this was an oxcart road. It almost certainly was used for hauling sugarcane to the trapiche at Lombardia toward the end of the 19th century and well into the 20th century.

TRENCH 60: 27 JUNE 2002. IN HILMA JENKINS' FINCA, IMMEDIATELY DOWNSLOPE FROM TRENCH 57.

This trench was placed immediately below Trench 57. Trench 57 was successful in finding intact stratigraphy and yielded an unusual number of artifacts, but it lacked sufficient slope to provide convincing evidence of actual path use. This trench was excavated where the slope along the path itself is 14 degrees, and the side-slope is 6 degrees. This trench indicates the zone and thus time of disturbance by path use was well prior to the emplacement of Unit 20, around AD 1450. It was a prehistoric path.

CONCLUSIONS

The methodology established by the Proyecto Prehistoric Arenal was successful in distinguishing historic and prehistoric cultural features. However, a closer examination of characteristics of these features may aid in future identification of prehistoric paths without expending unnecessary time on features that are likely modern in origin. One of the strongest factors is slope; areas of low slope often do not have the slope catchment necessary for the formation of footpaths. Therefore, anomalies observed on hillsides with a slope of 10 degrees or more are the most likely to be the remains of ancient footpaths while anomalies with a lesser degree are either equivocal upon excavation or, in the case of very low slope, often the remains of fence lines. Fence lines are the second factor that deserves discussion. Many anomalies were strongly apparent on the imagery, yet upon excavation were revealed to be the result of maintenance of a fence line. This is due to the repeated cleaning of fence line using a shovel or machete. This use not only removes vegetation from the fences, but after years of cleaning results in a depression that can appear to be like a footpath in the imagery.

I would suggest the following ways to differentiate prehistoric footpaths and fence posts in the imagery. The first is the presence of trees. In this area of Costa Rica, fence lines are formed by using posts which over time may grow into mature trees. However, these trees form unnaturally straight lines across the landscape. Therefore, if an anomaly is observed in close proximity to, or within, such a tree line it is most likely a result of fence line. Second, fence lines are exceptionally straight and visible for large spans on the imagery while confirmed footpaths are intermittently visible. This is likely a factor of topography, the third factor which can aid in ground verification. Footpaths often disappear in low-lying areas, as discussed above, while fence lines do not. Therefore, if the linear anomaly remains as strong in low lying areas as in areas of stepper slope, this is likely a modern feature and not a prehistoric footpath.

The differentiation of historic ox cart roads and prehistoric footpaths on the imagery is more difficult. In this area, local informants and historical knowledge may be the primary methods. This is because ox cart roads are often in locales of higher topographic relief, much like footpaths, and their erosion may also be affected by slope. The most effective means to quickly differentiate between the two types is by test-pitting for the presence of intact Unit 20. An incomplete or missing layer of Unit 20 likely indicates historic activity that eroded into the layer.

While it is difficult to differentiate prehistoric and historic features, utilizing multiple lines of evidence including topography, stratigraphy, artifacts, and association with known archaeological locales can identify prehistoric footpaths. Extensive testing of this methodology has been undertaken by the project and has successfully combined techniques of remote sensing with ground verification to trace pathways across the landscape of Costa Rica. It is hoped that this method may be applied, with necessary alterations, to other areas of the New World to aid in the identification of ancient pathways.

LITERATURE CITED

MCKEE, B., T. SEVER, & P. SHEETS. 1994. Prehistoric footpaths in Costa Rica: Remote sensing and field verification. In Sheets, P. & B. McKee (eds.) *Archaeology, Volcanism, and Remote Sensing in the Arenal Region, Costa Rica*, pp. 143-157. University of Texas Press, Austin.

APPENDIX A.
ADDITIONAL TRENCHING FOR FOOTPATHS

by Devin White

TRENCH 61

Land owner: Betty Tovar (San Jose). Her daughter lives on the property.
Location: 0.27 km NW of the finca house, 0.43 km S-SW of the cross on top of Cerro Tovar.

This linear anomaly was first identified on pedestrian survey while exploring potential laja sources with Jorge Barquero, then confirmed with IKONOS and CIR imagery. The anomaly runs roughly E-W along the gentle slope of the hill. Nine shovel tests were placed along the entire visible length of the anomaly to determine if there was intact Unit 20 present. The tests were inconclusive, however, so a 1m x 4m trench was dug in the upper third of the anomaly in an effort to obtain a better stratigraphic picture. The trench profile consisted of tephra-enriched soil bracketed by Unit 65 (Aguacate) below and a weak Unit 20/A horizon combination above, as well as a small area of highly oxidized clay near the bottom of the trench. The oxidized clay was quickly explained by the presence of a burned fence post remnant in the center of the trench. The above evidence strongly suggests that this anomaly is a recent fence line, once accidentally burned down during the process of clearing and burning of a pasture during the dry season.

TRENCH 69

Land Owner: Estefano Poma (San Jose). Access granted by Luis Angél Calvo Brenes-former mandador for 35 years-who still lives on the land with his family. His son is the current mandador of the finca.
Location: Ridge top in Finca Mandela due south of the Hilma Jenkins-Callan Vargas property boundary.

This linear anomaly was first identified on IKONOS imagery in the field while investigating several other anomalies present within the boundaries of this finca. The anomaly is in a pasture on top of the ridge and runs E-W along a very gentle slope, roughly parallel to the modern two-track road that connects this pasture to several others in both directions. Four shovel tests were placed within the anomaly to see if intact Unit 20 was present. The profile of shovel test 2 contained good Unit 20, so two additional shovel tests were placed directly to the north and south of it to see if the Unit 20 continued beyond the anomaly on both sides. When it became clear that Unit 20 did not continue in these areas, a 1 x 4 m trench was placed across the anomaly further to the west to get a better idea of what the stratigraphy looked like in a different location with the continuous exposure that a trench provides. The trench turned out to be very shallow. The profile consisted of Unit 65 (Aguacate), Unit 55, a layer of Unit 50 directly below Unit 20, followed by a plowed A horizon (recent past). The depression present on the surface cuts down into Unit 20 almost completely but does not go into Unit 50 at all. The linearity of this anomaly, its location at the top of the ridge, the nature of the trench profile, and the long history of the sugar cane cultivation on this finca su-ggests that this anomaly is an historic oxcart road.