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# VÍNCULOS

REVISTA DE ANTROPOLOGÍA DEL MUSEO NACIONAL DE COSTA RICA  
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DE COSTA RICA

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#### NUESTRA PORTADA (OUR COVER)

Vista tridimensional del área de Tilarán por sobreposición de una imagen del satélite IKONOS, provista por la NASA, y un modelo digital del terreno, los puntos amarillos señalan un sendero arqueológico de la fase Silencio. La combinación de imágenes fue hecha por Tom Sever y Daniel Irwin de la NASA.

Three-dimensional view of the Tilaran area achieved by the draping of an image from the IKONOS satellite, provided by NASA, over a

digital terrain model, the yellow dots indicate a Silencio Phase archaeological footpath. The image combination was done by Tom Sever and Daniel Irwin from NASA.

#### VÍNCULOS

Este nombre evoca la posición conectora de Costa Rica y del sur de Centroamérica en el contexto geográfico del Continente Americano. Asimismo, expresa la importancia que tiene el análisis de las relaciones entre aspectos sociales, históricos, culturales, lingüísticos y biológicos, dentro de un grupo y entre grupos humanos.

The title represents the connecting position of Costa Rica between the American Continents. In like manner, it express the importance of analyzing the relationship among social, historic, cultural, linguistic and biological aspects among and between human groups.

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## INTRODUCTION

**Payson Sheets**

Anthropology, University of Colorado

### RESUMEN

*El Proyecto Prehistórico Arenal se inició a principio de los años 1980, cuando yo realizaba una búsqueda de áreas donde erupciones volcánicas explosivas habían afectado sociedades simples. Para esa época había identificado algunos casos de vulcanismo explosivo donde se habían visto afectados cacicazgos complejos y pequeños estados (e.g., la erupción del Ilopango en El Salvador, Volcán Barú con los cacicazgos Barriles en Panamá y otros casos en México). Las erupciones frecuentes del Arenal en el milenio reciente (Melson, 1994) indicaron que esta área podría satisfacer las expectativas de dicha búsqueda y las investigaciones así lo demostraron. Las sociedades precolombinas en el área del Arenal nunca llegaron a ser cacicazgos o estados, aunque hay algunas indicaciones de diferencias sociales en el cementerio del sitio Bolívar (Hoopes & Chenault, 1994) y algo similar, aunque menos marcado, en el cementerio del sitio Silencio (Bradley, 1994b). En la mayoría de los siglos en que grupos sedentarios amerindios vivieron en el área del Arenal, las sociedades se mantuvieron igualitarias; pero aparentemente durante las fases Arenal y Silencio estaban empezando a mostrar diferencias sociales basadas en el parentesco.*

*Es muy probable que las sociedades de Arenal fueran muy flexibles ante los impactos de las erupciones explosivas, en comparación a sociedades más complejas en Panamá y Mesoamérica. En Arenal, no pudimos detectar cambios culturales en los grupos que reocuparon las áreas devastadas. Buscamos cambios en cerámica, lítica, arquitectura, patrones de asentamiento, prácticas funerarias y otras categorías culturales. La resistencia al cambio en las sociedades de Arenal puede derivar de un número de factores, incluyendo la mínima dependencia en la agricultura, ya que su alimento provenía en gran parte de plantas y animales silvestres. No edificaron grandes construcciones, tenían poblaciones con densidades bajas, y probablemente los contactos y reciprocidades con sociedades fuera de la zona afectada facilitaron la reubicación de refugiados. Esto contrasta con sociedades complejas en Mesoamérica, que dependieron de la agricultura intensiva basada en el maíz. Poseían, además, elaborados edificios religiosos y cívicos, economías centralizadas, alta densidad de población y no contaron con áreas adecuadas para refugiados. En los casos donde hubo hostilidad y competencia entre asentamientos, las sociedades devastadas generalmente eran muy vulnerables a los disturbios causados por las erupciones volcánicas.*

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*El presente volumen es un compendio inusual, porque algunos de los artículos son específicos y cortos, como los que presentan resultados de investigaciones que se enfocan en segmentos de senderos antiguos o en sitios arqueológicos pequeños. Otros artículos son más extensos y cubren temas más amplios, como los relativos al periodo Tempisque, la cerámica o el sitio monumental Cutris.*

#### **ABSTRACT**

*The Proyecto Prehistorico Arenal began in the early 1980s, when I was looking for an area with explosive volcanic eruptions that affected simpler societies. At that time I had assembled some cases of explosive volcanism affecting complex chiefdoms and small states (e.g., Ilopango eruption in El Salvador, and Volcan Baru with the Barriles chiefdoms in Panama, and other cases in Mexico). Arenal's frequent eruptions in recent millennia (Melson, 1994) seemed to fit the need, and subsequent research has borne that out. Arenal area societies never developed into clearly ranked societies, although there are some indications of the beginnings of some social differentiation at the Bolivar cemetery (Hoopes & Chenault, 1994) and somewhat less differentiation at the Silencio cemetery (Bradley, 1994b). For most of the centuries of sedentary peoples living in the Arenal area, the societies remained egalitarian, but they apparently were pushing the boundaries toward inherited inequality during the Arenal and Silencio phases.*

*One of the most important insights to emerge from comparative analyses of societies impacted by the sudden massive stresses of explosive eruptions is the striking resilience of Arenal area societies. In case after case, we are unable to detect any cultural changes as people reoccupied the previously devastated area. We look for changes in ceramics, lithics, architecture, settlement patterns, burials, and any other category accessible to us. The resilience of Arenal societies may derive from a number of factors including their minimal reliance on agriculture as they emphasized wild food sources, their avoidance of large built facilities, low population densities, and perhaps regional contacts and reciprocities facilitating relocation of refugees. This contrasts with the complex societies of Mesoamerica relying heavily on intensive agriculture and a maize staple, elaborate constructed religious and civic buildings, centralized economies, high population densities, and lack of adequate refuge areas. In cases where there were chronic hostilities among polities, the devastated society often suffered badly.*

*This is an unusual collection of articles, in that some are very specific and short, such as those presenting the results of focused research on a segment of ancient footpaths or on a particular small archaeological site. Other articles are longer and cover broad topics in an ample fashion, such as those dealing with the Tempisque period, ceramics, and the Cutris site.*



## **PREVIOUS RESEARCH RESULTS**

I made two preliminary visits to the Arenal area in the early 1980s to explore the possibility that there was sufficient explosive volcanism affecting relatively "simple" societies. The first visit was with William Melson and Michael Snarskis in 1981, and the second was with Robert Drolet in 1982. The more I looked the more the area seemed to fit the requirements, and proposal writing began. Fortunately the proposals were funded and two long field seasons ensued, in 1984 and 1985. The National Science Foundation and National Geographic Society were the principal supporting agencies. Shorter field seasons followed, in 1986, 1987, and 1991 (Sheets, 1994a).

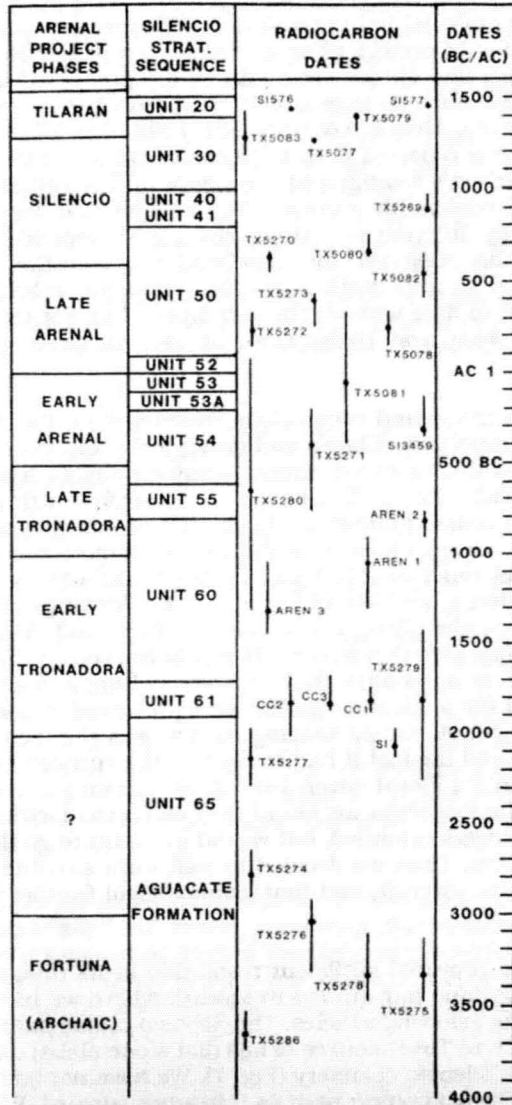
A major effort of the project was accurate dating of the eruptions and their volcanic ash layers as well as of archaeological sites, and the total of 30 radiocarbon dates (Sheets, 1994a) assisted in establishing a chronological framework. The basic correlations of culture in terms of project phases with tephra (volcanic ash) deposits from Arenal's major eruptions, and chronometric dates, are presented in Table 1. It should be noted that some of Melson's datings and attributions of the earlier tephra deposits have been challenged (Soto, Alvarado & Ghigliotti, 1998), but that has little import for the recent research that is reported in this volume because our focus is on the Arenal and Silencio phases. Melson's stratigraphic sequence and eruption dating for the past 3000 years seems to be reasonably accurate. The volcanic ash deposits from the dated eruptions are sufficiently different in texture, color, granulometry, and hardness that where they are reasonably preserved they can be identified in the field. Thus we often can date a feature such as a footpath in the field with the volcanic ash layers. The paths would be difficult to date without the ash layers, but not impossible, if ceramic densities along but not away from paths, could be used for dating paths not buried by volcanic ash layers.

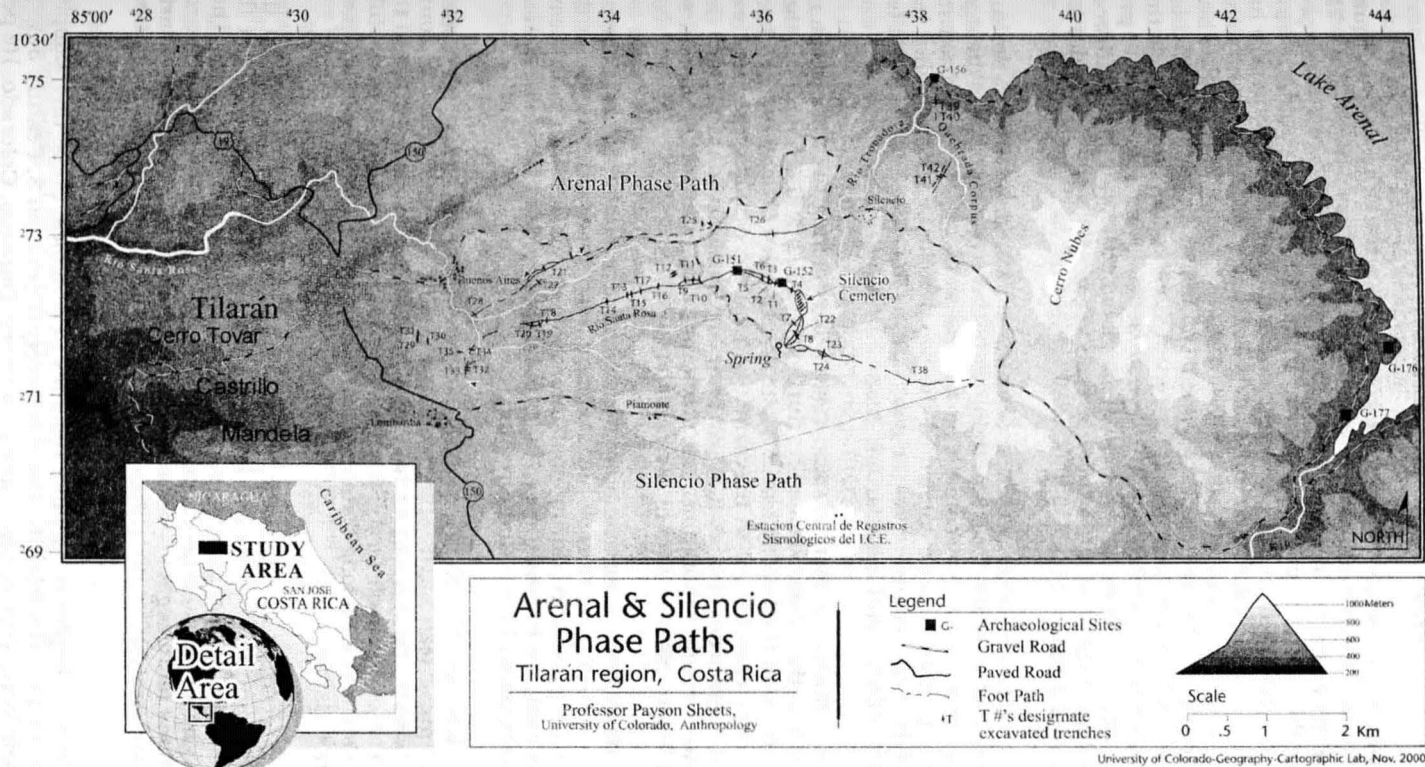
The archaeological surveys and excavations conducted in the 1980s found dozens of archaeological sites (especially villages and graveyards) and features, including footpaths. Tom Sever and NASA provided remote sensing imagery from satellites (LANDSAT) and research aircraft. The satellite images were useful for general environmental purposes, but were too coarse grained to detect any archaeological features. In contrast, the NASA aircraft imagery in analog and digital formats was so detailed that we could detect features as small as a few inches. We could even read political slogans written on streets in Tilaran, and see children's chalk drawings on sidewalks. In one case a landowner enjoyed identifying his house, but then said "*hey, this is Jose Luis's pickup truck in front. When was this taken?*" It was in the color infrared airphotos that we first detected the linear anomalies that, upon trenching and studying their stratigraphy, we realized that the ancient footpaths were preserved in some areas. The principal difficulty with the NASA remote sensing aircraft was the tremendous expense in getting it to Costa Rica, and the fact it had to wait on the runway in Alajuela day after day waiting for less than 5% cloud cover, thus delaying many other missions. In surveying and trenching the footpaths we found they extended farther west and farther east than our aircraft imagery extended, but we did not want to go through the anguish of another aircraft mission. Thus we decided to wait until satellite imagery improved sufficiently to not need the aircraft, and that technological frontier was crossed by AD 2000.

The IKONOS satellite provided sufficient resolution in its imagery for us to detect linear anomalies and continue our survey westward, where we have had our greatest successes, detailed in the following articles. The Silencio phase path has been followed westward, close to the Cerro Tovar source of *laja* (flat stone slabs) used in construction of the "box" tombs in the Silencio cemetery (Fig. 1). We have not had success in detecting and confirming the Silencio phase path as it heads eastward. We have been able to

detect and confirm that eastward path to the spring and then continuing 1.9 Km farther eastward, but we have not been able to find any remnants of it farther east than that. Some of the reasons are clear, that the huge earthquake of 1973 caused massive landslides that destroyed many segments of the path, and roads built in the past two centuries may have destroyed other segments. But it is hard to imagine that these agents of disturbance have eradicated all remnants of the path. We will keep trying, as it appears likely that a village or villages that supplied dead bodies to the Silencio cemetery lies in that direction.

**Table 1**  
Correlation of cultural phases, tephra and soils units, with chronometric dates  
(from Sheets, 1994a:14, drawn by Brian McKee)





**Fig.1** Map of the Arenal-Tilaran research area, with footpaths indicated; the Cerro Tovar source for lajas used in the Silencio cemetery is indicated, and the Castrillo and Mandela fincas are labeled.

## **THE PRESENT PROJECT**

As a result of benign and persistent urging by Tom Sever, NASA agreed to acquire four scenes from the IKONOS satellite that covers our research area (see Fig. 1). The satellite passes over the research area every day and examines cloud cover. It was programmed to acquire data if the cloud cover was less than 5%. It took a couple years to find the right time, but finally all four scenes were acquired. The IKONOS imagery has proven invaluable in detecting faint linear anomalies that have, on excavation, sometimes turned out to be remnants of both the Silencio and the Arenal phase paths headed west. The imagery also, of course, picks up linear anomalies that have turned out to be historic ox cart roads, fence lines, and other recent phenomena. In the article that follows this one, Tom Sever describes how the remote sensing was done for this project. Michelle Butler describes how the project used a global positioning satellite receiver to improve our knowledge about locations of path segments, trenches, and other features, with  $x$ ,  $y$ , and  $z$  coordinates.

Devin White begins the archaeology section of this issue with an article on the survey of the two fincas of Castrillo and Mandela, with the trenches which divulged whether an anomaly was an ancient footpath or was caused by more recent activity. It was particularly important that he confirmed the two parallel linear anomalies leading into and out of the Poma cemetery, on the east side, as ancient footpaths. The two join higher up on the hillside and head farther east.

Errin Weller writes about the methods and results of exploring the Silencio phase paths on the west side of the Silencio cemetery, during the 2002 field season. She then presents the excavations in the heavily looted Castrillo cemetery. It is very interesting that people hauled river rock for use in the cemetery, past the cemetery, to be stored in a repository, and then brought back into the cemetery for tomb construction. One wonders if there was a consecration that took place, by taking the rocks out of a secular domain, and before placing them in the cemetery.

Michelle Butler describes the excavations at the almost pristine (largely unlooted) Poma cemetery. A few circular river rock burial tombs were excavated, along with the pottery vessels that were smashed during post-interment rituals. As both paths leave the cemetery to the east, we presume the village that supplied dead bodies and post-interment ritual participants lies in that direction.

Derek Hamilton describes the 2002 trenching excavations that were conducted atop the small hill that Spur 1 lead to. The spur was a perpendicular path that led south from the Silencio phase pathway about midway between the Tovar laja source and the Silencio cemetery. The only reason we could come up with for people to hike to the hill-top is to view the cemetery; for a long distance in either direction along the main path the cemetery was not visible.

Juan Vicente Guerrero *et al.* begin the analytical section with an article on the ceramics excavated from the Castrillo and Poma cemeteries. They look closely at the ceramics in terms of typology, manufacture, chronology, and cultural affiliation. They also suggest some chronological adjustments to the phase sequence in the research area. Their suggestions and insights deserve careful consideration. Their ceramic article is followed by my analysis of the chipped stone and ground stone artifacts from those cemeteries.

We wanted to have a chapter on organic residues in ceramics. Some tiny samples of incrustated residues on sherds from the Poma cemetery (Operation 3, Feature 3) were submitted to Dr. Dale Wingeleth, of Chematox Laboratory, Durango, Colorado. He per-

formed gas chromatography and mass spectroscopy on three samples with a Hewlett-Packard model 5971 gas chromatograph/mass spectroscope. The results were negative. The organic compounds we were seeking had been leached out during the centuries intervening between their emplacement at the cemetery and our excavations, and all that was left was charcoal. At least that charcoal was dateable (see Conclusions chapter).

We have been wondering since the mid 1980s where the laja slabs came from, that were used in the Silencio cemetery. Jorge Barquero conducted geological fieldwork with us in 2002 and was able to determine that Cerro Tovar was the most likely source of the laja in the Silencio cemetery. As he was doing that, we were determining that the Silencio phase path was headed that direction, so both kinds of analyses were coming up with the same conclusion. Briana Agar and Charles Stern contribute a detailed and convincing article indicating also that Cerro Tovar was the principal source of Laja for the cemetery, based on petrographic and chemical evidence.

Mauricio Murillo provides a funerary context for this volume, by reviewing current knowledge of cemeteries and burial practices during the Tempisque period in areas surrounding the Arenal Prehistory Project in Costa Rica.

Ricardo Vázquez *et al.* contribute an article on the huge constructed sunken roadways running into, out of, and around the Cutris site to the east of the Arenal area. His research has started me wondering if there might have been a relationship between the simple straight eroded paths that developed in the Arenal area, leading into cemeteries, and these huge roadways. It seems possible that the cultural standard developed that the proper way to enter a special place was by a sunken straight entry that developed inadvertently among simpler people, with nothing constructed. Then later, with more complex societies, and the emergence of the mentality of monumentality, the chief ordered massive and long sunken entry roadways to be constructed. So there might have been a continuity from early inadvertent earthen sunken paths to the massive constructed sunken earthen roadways at Cutris. And then later big sites such as Guayabo de Turrialba may have continued constructing monumental features, including roadways, and done them out of stone.

The final article is a summary of the accomplishments of the Proyecto Prehistorico Arenal.

#### **ACKNOWLEDGEMENTS**

I thank the National Science Foundation for supporting our 2002-03 research with Grant BCS-0107943. John Yellen has been particularly helpful. The Comision Arqueologica Nacional graciously granted us permission to conduct this research. Archaeologists at the Museo Nacional have been particularly helpful and have greatly improved the nature of our research in their country. We particularly wish to acknowledge the professional and personal support of Francisco Corrales, Maritza Gutierrez, Juan Vicente Guerrero, Ricardo Vázquez, and Adrián Badilla. Costa Rican archaeologists are setting a high standard for Central American archaeology.

Members of the research crews in the various seasons deserve a lot of credit. In particular, Brian McKee, John Hoopes, John Bradley, Mark Chenault, and Marilyn Mueller have contributed countless hours of effort to understand what happened in the Arenal area in the ancient past. My hat is off to them.

Recent seasons have greatly benefited from the work by Michelle Butler, Tom Sever, Daniel Irwin, Errin Weller, Mauricio Murillo, and Devin White. I particularly appreciate Devin's help with digitally massaging all the idiosyncratic formats of the figures into a workable mega file for publication.

We all appreciate the gracious assistance of Luis and Gabriella Jimenez, Finca el Silencio, in allowing us to live on their wonderful property. We appreciate the permissions and assistances from Francisco Castrillo, Estefano Poma, and Luis Angel Calvo Brenes for access to their important resources. It was a pleasure for us to work with our field crew of Costa Ricans: Mario Ugalde Nuñez, Minor Arias Brenes, Denis Emelio Mendez, and Yoleni Muñoz.

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