

KENTRO

The Newsletter of the INSTAP Study Center for East Crete

Volume 4 (Fall 2001)



MESSAGE FROM THE DIRECTOR

As an institution like ours grows, years will be marked with both the pleasure of successful events and new faces and the sad departure of colleagues and friends who have passed away. It was, thus, with great sadness that we learned of Prof. William Coulson's death this past June. As director of the ASCSA, Coulson nurtured a host of archaeological projects in Eastern Crete, beginning with new excavations and surveys, two of which he co-directed. These efforts, along with the work of others, culminated in the construction of the INSTAP Study Center for East Crete in 1997, where he served on several oversight committees. He was a colleague and mentor to many in the field, and a dear and respected friend of those living in the villages of Kavousi and Pacheia Ammos. The bridges he built for those working on Crete will stand for years to come, and his archaeological legacy will take form in the future publications of his excavations at Kastro and Halasmenos. As a tribute to his contributions and vision, the Managing Committee has renamed the Conservation Laboratory of the Study Center in his honor; the facility will be known as the William Coulson Laboratory.

This past year also saw the Study Center progress in its mission to support the study and publication of Cretan material culture and to serve as a meeting point for those conducting this work. The increased number of student visitors, some of whom are returning to begin studies in the area, particularly encouraged me. Our individual members are working not only on material from Cretan excavations and surveys, but also on broader subjects of Cretan and Greek history. The year also saw important discoveries in the field at Halasmenos, where a new

Late Minoan IIIC shrine was discovered in May.

The Study Center's summer lecture program was again an opportunity for friends and colleagues to gather together and hear of new research in the field. We were pleased to host three talks. First, Sandy MacGillivray presented a stimulating paper examining the Minoan use of celestial bodies, which was followed by an impromptu stargazing session. The second talk, given by Jan Driessen, provided us with a review of the evidence for the Late Minoan IB period in Eastern Crete. Finally, the outstanding work being done at the Geophysics Laboratory of the Institute for Mediterranean Studies was described by

Apostolos Sarris. Our members also enjoyed the hospitality of the U.S. Sixth Fleet in Suda Bay while on board the USS Philippine Sea for the farewell reception for U.S. Ambassador to Greece, Nicholas Burns, who has done much to promote our work.

In August, the 24th Ephoreia of Prehistoric and Classical Antiquities and the Demos of Aghios Nikolaos hosted a ceremony honoring the American, British, and French Schools of Archaeology and Classical Studies for their work in East Crete. The INSTAP Study Center for East Crete contributed a series of posters for American Projects and Greek-American Collaborations in the area, and Jim Muhly, Donald Haggis, and I spoke about the significance of our work. We are most grateful to the municipality of Aghios Nikolaos, the mayor, and the organizers for this honor and their hospitality. We also would like to thank our colleagues in the 24th Ephoreia of Prehistoric and Classical Antiquities without whose support this work would not be possible.

Thomas Brogan



Donald Haggis, Jim Muhly, and the mayor of Aghios Nikolaos at the Aghios Nikolaos Museum festivities in August.

Two New Protopalatial Ware Groups from Petras, East Crete

Donald Haggis

This brief article is a result of an ongoing study of a closed deposit of Middle Minoan IB-IIA pottery from the site of Petras in eastern Crete.* Two new ware groups—*spatter ware* and *rough-burnished ware*—are introduced here and put into the broader context of pottery production and consumption in the Protopalatial period in eastern Crete.

Dark-on-light wares are typically defined as a loosely associated style (Betancourt 1985) rather than a formal ware group. In East Crete, the decoration is comprised of simple linear, floral, geometric, trickle, and blob designs, which are added directly to a plain ground or light-colored slip. Plumes, disk spirals, and trickle forms predominate. Walberg's comprehensive study of decorative motifs characterizes the "trickle" pattern as a feature of "simple domestic vessels" (1983, p. 64), while Betancourt describes the style as lacking "the artistic excellence of some of its contemporaries" (1985, p. 87).

The dark-on-light style thus embodies the rustic ware of the countryside. The apparent simplicity and accidental quality of many dark-on-light pieces represent a qualitative opposition to the precision, visual vitality, and syntactic complexity of Kamares ware. In this comparison, we customarily assume both a sociopolitical and a geographic distance from the Kamares' origin of production and context of consumption. The dark-on-light wares, especially those constituting Walberg's broadly defined "trickle" category, are understood as distinctly pedestrian, non-palatial, utilitarian, and quintessentially "provincial."

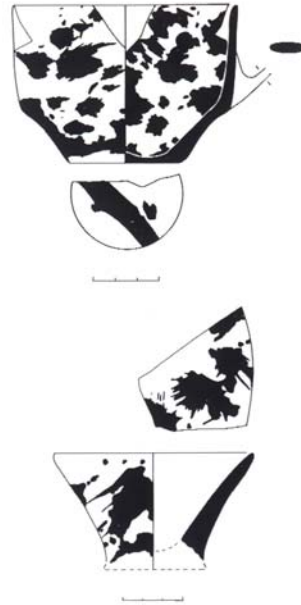


Figure 1 Spatter ware conical cup and carinated cup.

Here, however, I wish to bring one category of this style squarely into a ware-group of its own, and to establish its status as a part of elite or "palatial" consumption in East Crete.

Petras is located in northeastern Crete on the edge of the Bay of Siteia. In 1996, Metaxia Tsipopoulou made two important discoveries concerning the early history of the site: one was a hieroglyphic archive, and the other a MM IB-IIA pottery deposit. The

* The study is currently taking place at the INSTAP Study Center for East Crete, and I am grateful to the staff of the Center for their continuing support. I am also grateful to the Director of the Petras Excavations, Metaxia Tsipopoulou, for inviting and encouraging my study of the Lakkos assemblage, and to Nikos Papadakis, the Director of the 24th Ephoreia, and Stavroula Apostolakou, for permitting and facilitating the study within Archaeological Museum of Siteia and the INSTAP Study Center for East Crete. Funding for the ceramic study has been provided by the Institute for Aegean Prehistory, the Curtiss T. Brennan and Mary G. Brennan Foundation Inc., and the University of North Carolina at Chapel Hill.

destruction date for the archive—and indeed the date for a major phase of rebuilding—is MM IIB, coinciding with Quartier Mu at Mallia and the bulk of the Knossos Kamares deposits. The focus of my discussion here is an enormous fill deposit, called the “Lakkos” by its excavators. The Lakkos is a large depression in the bedrock on the north side of the Petras hill measuring three meters in diameter and two meters deep. This depression was filled with a remarkably large deposit, which is homogeneous in both chronology and function, and very dense. So far, about half of the deposit has produced over thirty *klouves* of pottery, comprised of 60,000 sherds weighing approximately 2,000 kilograms.

The fine wares in the Lakkos deposit consist of the following: white-on-dark ware; dark-on-light ware; monochrome black and red; rough-burnished; and polychrome. The polychrome examples fit into the “early Kamares” repertoire, and “phase 2” morphology as established in Walberg’s analysis of provincial

forms and styles. The shapes are similar to wares found in MacGillivray’s Knossos group A, in Andreou’s south-houses group at Mallia (rather than the town group), and in Mochlos House D and Vasiliki House B.

Spatter Ware

Spatter ware sherds are sufficiently and consistently different from trickle and linear forms of the dark-on-light style to warrant a separate “ware group” designation. While the broader “dark-on-light” category includes wares that employ a variety of seemingly random surface treatments, such as blobs, trickles, drips, irregular blotting, and banding, spatter ware is distinctive in the handling of the surface, consistent in its application, and striking in its overall effect.

In spatter ware, the pot surface was treated by splattering the interior, exterior, and bottom of vases with splashes, rather than dabs of slip, with an effect almost reminiscent of Abstract Expressionism. The vessel types are typically carinated and straight-sided cups, as well as conical cups, tumblers, and saucers (Fig. 1). Without exception, the fabric is the local “Petras buff” (Day 1995), a fossiliferous matrix of local Neogene marls, with phyllite and quartzite inclusions.

The potter sought the striking contrast of rich brown, red, and orange slips against the very pale white, tan, buff, or pink-buff surface or ground slip of the vessel. Some drips occur inadvertently, especially on the interior and bottom of vessels. Other areas, however, are decorated with radiating sprays of spikes and droplets, formed by the impact of the slip hitting the walls of the vase. While sometimes the thickness of the slip itself, or the porosity and texture of the surface, may have caused clumping, the intention was not to drag, dab, drip, or trickle the paint onto the surface. There is neither a lack of skill, nor a disregard for design implied by the apparent randomness of the resulting effect. The thickness of the slip, the spacing of the splatters, the treatment of the ground slip, and the method of execution seem carefully cal-



Figure 2 Comparison of tumblers in spatter ware, Kamares ware, and white-on-dark ware.



Figure 3 Examples of rough-burnished ware conical cups.

culated to maximize the surface space. Unlike the usual dipped, blob, or trickle decoration, the overall effect of spatter ware is dynamic, remarkably vivid in its sense of movement and its inadvertent complexity. Spatter ware stands in marked contrast to the economy, repetition, regimentation, and rhythm of East Cretan white-on-dark and polychrome, such as the “alternating style” (Floyd 1997), and central Cretan Kamares ware.

Rough-burnished Ware

Another seemingly random, but no less striking ware is called here rough-burnished ware. This type consistently appears in very large conical cups, round cups with an offset base, and angular or carinated cups (Fig. 2). The exterior surfaces of these vessels are hand smoothed and burnished with a thick dull slip ranging from red, brown, and reddish brown, to pink, orange, and gray. The interiors are lightly or heavily burnished, usually with visibly irregular burnishing marks or impressions. In some cases the interior is covered with a slip, producing a dark gray to black polished surface.

As in the case of the spatter ware, there is a consistent and controlled handling of the vessel with subtly unique and decidedly diverse results. The hieroglyphic sign “041” (Fig. 3) was found incised on

the exterior of two such rough-burnished ware conical cups, perhaps indicating a special use or specific function of cups in this ware group. The juxtaposition of identical fine ware shapes in rough-burnished ware and spatter ware, alongside white-on-dark and polychrome wares, suggests extreme stylistic diversity (Fig. 3). The work of Andreou (1978), Betancourt (1977; 1985), MacGillivray (1987), and Walberg (1983; 1987), among others, has presented a picture of ceramic regionalism in the Protopalatial period that is sufficiently vivid to begin visualizing spheres of distribution. The correlation of stylistic interaction with a social process was made by John Cherry in his 1986 paper, “Politics and Palaces,” and Gerald Cadogan in 1990, with the introduction of the notion of a “Lasithi State,” an analysis inspired by the results of excavations at Myrtos Pyrgos and Quartier Mu at Mallia.

The innovation, diversity, and stylistic variation that we are beginning to see in the Petras Lakkos may be related to competitive social-symbolic displays in an important formative or transitional phase in the life of the palace, such as the rebuilding in MM IIA and the restructuring of the sociopolitical landscape. As has been observed for transitional chiefdoms in Mesoamerica, the elaboration, experimentation, and innovation in styles characterize change in the ceramic assemblage during periods of political reorganization (Clark and Blake 1994). During these periods, novelties predominate; altered and imitated forms or inventions become media for elite expression in contexts of public feasting. Peter Day and David Wilson (1998) have emphasized the social and ritual importance of Kamares consumption at Knossos, with wares derived from south central Crete, while Carl Knappett (1999) has argued for a segmented state in East Crete, with elite groups imitating certain ceramic styles derived from centers which have a social-religious significance in the region rather than any direct economic or political

control. In light of this recent work, ceramic diversity at Petras is being examined as a social dynamic rather than part of a regional or provincial aesthetic.

Both spatter ware and rough-burnished ware may indicate an administered mode of production such as that postulated by Carl Knappett for the fine tablewares at Myrtos, Mallia, and MM IIB Petras. While the stylistic diversity could reflect a dynamic, symbolic competition among elite ruling groups in public or ritual venues, the social display may also have visually reinforced organizational hierarchies, or

even a distinct structure with a multiplicity of competing corporate groups. The stylistic variation among ware groups, and the distinctive combination of ware groups in the assemblage, might eventually provide a formal and relational palimpsest for past interaction, aiding our understanding of the process of consumption. This process was perhaps a form of visual exchange that may have masked a social discourse involving competitive display and other visually responsive power relationships. □

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MANTINADES ΠΡΟΣ ΤΙΜΗ ΤΟΥ ΒΑΣΙΛΗ COULSON

The following poems were composed in honor of William Coulson by his friends from Kavousi, Marcella and Manolis Kasotakis, and Semos Dermitsakis. These mantinades were originally read by Thomas Brogan in September at Willy's memorial service in Athens.



Πάνω στου Κάστρου την κορφή
Για σένα έχει μείνει
Ένα ποτήρι με ρακή
Νερό σ' ένα λαγήνι

Τ' αφήσανε οι φίλοι σου
Αν τύχει και περάσεις
Να βρεις Βασίλη μια ρακή
Νερό να ξεδιψάσεις

Για σένα που δεν είσαι δω
Απόψε να σε δούμε
Οι φίλοι σου μαζεύτηκαν
Έχουν πολλά να πούνε

Έφυγες, δεν προλάβαμε
Βασίλη να σου πούμε
Για το έργο που μας άφησες
Οτι σ' ευχαριστούμε

Ελλάδα και Αμερική
Φίλοι δικοί πενθούνε
Τα μάτια μας δακρύζουνε
Όταν σε θυμηθούμε

Όλα τα σβήνει ο θάνατος
Πλούτη και μεγαλεία
Και μένουνε αθάνατοι
Οι άνθρωποι που 'χουν αξία.

A Fond Farewell

Katherine E. May

My position as Chief Photographer for the INSTAP Study Center for East Crete began in 1997, when the Center opened. My job was expanded in 1998 when the INSTAP Publication Team was conceived with the aim of aiding in the publication of Bronze Age material by providing technical archaeological services to projects. The position allowed me to photograph Bronze Age artifacts at sites around the Aegean, a unique experience in archaeological photography.

Over the past five years, I photographed artifacts for more than twenty-five projects. The materials ranged from pottery to frescoes to a wide variety of metal objects. I found my work environment to be a dynamic one that included museums, castle towers, and the occasional ship shed.

Photographing objects is the art of capturing specific information on film. Similar to the photography of commercial objects, the photography of archaeological artifacts must show information ranging from an object's shape to its manufacture. Seldom is this simple; the photographer is presented with a variety of problems to solve for each object in order to obtain the best possible image in the allotted time.

The time allotted to the photographer, or the lack thereof, created many memorable experiences over the years, such as one trip to the Herakleion Museum this past spring. I arrived at the Museum early on a Monday morning, and had two hours to set up and completely photograph (in general and detail shots) the Griffin Fresco from the Throne Room at Knossos. The placement of the sarcophagus from Aghia Triada directly in front of the fresco was a large obstacle to photographing the entire wall painting, but the ability to get right up to the work for detail pictures was very exciting.

There were several trips to museums where I photographed many Minoan artifacts I had

first seen in textbooks or heard about in classes. One of my most exotic museum experiences was at the Museum of Nautical Archaeology in Bodrum, Turkey. There I photographed many of the Bronze Age artifacts found at the site of the Uluburun shipwreck. The word exotic was not on my mind as I doggedly photographed hundreds of metal ingots, one at a time, but it was definitely applicable while I was photographing some of the magnificent jewelry and spectacular small finds.

These and many other wonderful experiences broadened my knowledge, skills, and understanding of not only photography, but also of Aegean Bronze Age artifacts. After much thought, I have decided to return to my home and family in California to pursue other career goals. To the many projects and archaeologists I worked with over the past five years, I would like to say thank you. Most of all I would like to thank INSTAP for the opportunity to equip and run the photography studio at the Study Center for East Crete and for making possible the many experiences and memories I will forever cherish. □



Laser-Induced Breakdown Spectroscopy (LIBS)

A Report on Current Research

Susan Ferrence and Demetrios Anglos

The Institute for Aegean Prehistory (INSTAP), and the Foundation for Research and Technology Hellas, Institute for Electronic Structure and Laser (FORTH-IESL) in Herakleion, have been collaborating for three years on a project dealing with the scientific analysis of archaeological materials. A compact and transportable desktop workstation has been developed based on Laser-Induced Breakdown Spectroscopy (LIBS) for the elemental analysis of archaeological samples. The main application of the system is to provide on-site, rapid, analytical information about the qualitative and quantitative elemental composition of a wide variety of materials aiding the characterization of archaeological objects and/or samples. Measurements focus on the identification of spectral emission lines for different elements present in major or minor quantities in the sample, and on the correlation of spectral intensity with the quantitative composition of samples. The LIBS instrument could potentially become a very useful elemental analysis tool for the archaeological laboratory.

Laser-Induced Breakdown Spectroscopy (LIBS) is an analytical technique based on the generation of excited atoms and/or ions on a sample by means of a pulsed laser and recording and analysis of the fluorescence emitted by the excited atoms or ions. Briefly, in a typical LIBS measurement, an intense pulse from a nanosecond laser (duration of the light pulse is around 10 nanoseconds; 1 nanosecond = 1

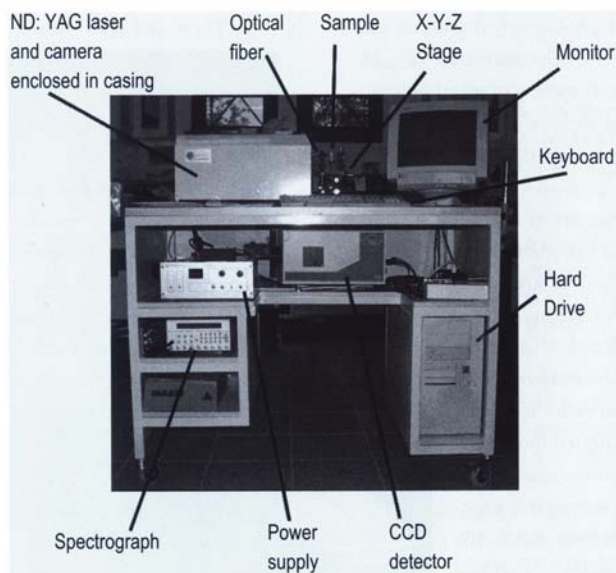
billionth of a second) is focused on the surface of a sample to be analyzed, resulting in the ablation of a tiny amount of the material, which produces a hot plasma plume. The emission spectrum from the plasma plume is collected and analyzed by means of a spectrograph-optical multichannel analyzer detection system. The laser beam is focused on a tiny spot of the material to be analyzed (ca. 100 micrometers diameter) providing nearly microscopic resolution as well as depth

profiling information if successive pulses are delivered on the same point. The emission spectrum leads to the identification of the elements in the sample while it can also provide semi-quantitative information regarding the composition of the analyzed material.

LIBS is advantageous because it is a simple and rapid process with no sample preparation required. Also, the technique is micro-destructive; less than a microgram is removed in

the analysis process (almost invisible without magnification). Another advantage is the ability of the laser beam to focus on a tiny spot, as small as fifty micrometers in diameter. In the examination of ceramics, for example, the instrument can focus on an inclusion in the pottery sample, or it can avoid inclusions altogether and focus on the fabric matrix.

As previously mentioned, LIBS was designed to be a portable system. Because of this, a specialized laboratory is not necessary for its operation. This is especially important



in the analysis of archaeological materials. Objects can be analyzed in museums, archaeological study centers, conservation facilities, and other locations that conduct routine

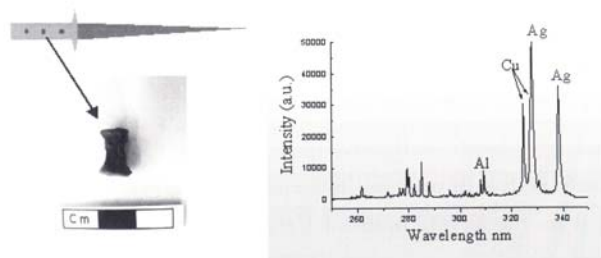


Figure 2 Detection of silver (Ag) on the flat surface of a copper rivet from a metal dagger from Psaira.

study of excavated materials. Quick qualitative or semi-quantitative analysis of the usually large number of samples from an excavation site can provide valuable information regarding the findings and guide further research. The possibility of using an inexpensive and simple analytical instrument on-site, instead of shipping samples to a specialized laboratory, can eliminate long time delays associated with the complicated administrative procedures required for transporting objects of cultural heritage.

The LIBS desktop system was installed in the Study Center during the summers of 2000 and 2001 for analysis of archaeological materials. Demetrios Anglos, Alina Melesanaki, and MariPaz Mateo of FORTH-IESL and Susan Ferrence of Temple University tested a variety of samples from different projects working at the Study Center, several of which will be mentioned here. Copper alloy artifacts from Mochlos were tested at the request of Jeff Soles. The results indicate the possibility for determining approximate percentages of the metal alloy components. These percentages enable us to distinguish between arsenical copper, tin bronze, and unalloyed copper.

Additional artifacts from the Aghios Nikolaos Museum, including a metal dagger from Aghia Photia, were also examined. The dagger displayed a curious sheen on some areas of

its surface. This material was identified by the LIBS system as silver, most probably due to a treatment of silver nitrate during conservation of the object, many years ago, to stop the advancement of bronze disease. In cases such as this, LIBS can be used by modern-day conservators to quickly learn what materials were used in past conservation efforts. This knowledge can help and influence the present conservator in his or her own handling and treatment of the object.

Donald Haggis provided both white-on-dark ware and polychrome sherds from Petras for analysis. The white paint on locally produced white-on-dark ware was found to contain large amounts of aluminum and calcium, and smaller amounts of iron and magnesium. In some of these samples, no iron or magnesium was detected at all. White paint of the polychrome sherds, however, contained little calcium (sometimes none at all) and larger amounts of aluminum, magnesium, silica and iron. These contrasting intensities of certain elements in white paint such as calcium and magnesium may become a factor in determining the provenance of pottery, or at least the types of slip available to potters in certain regions.

As a result of this testing at the Study Center, valuable feedback was obtained for the improvement of the LIBS desktop system. The system will be upgraded in the Fall of 2001 with a smaller, more accurate laser and detector, a new computer, improved software for ease of use and identification of elements, and an even more compact configuration for the laser, optics, and mounts. The final version of the LIBS desktop system will be permanently installed in the Conservation Laboratory of the INSTAP Study Center over the winter of 2002. □

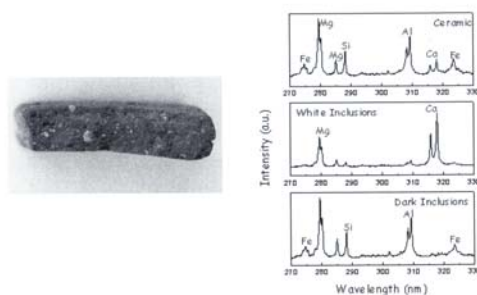


Figure 3 Analysis of small inclusions in a ceramic sherd with spectra showing the differences.

Announcements



Congratulations to Erieta Attali, the new photographer for the INSTAP Study Center for East Crete's Publication Team. Ms. Attali has a Master's degree from Goldsmith's College, University of London, and currently holds a Fulbright Artist Award at Columbia University. She has worked on a variety of projects including the photography of the ivory objects from the Royal Tombs of Vergina, where she established a photography laboratory at the site. She has considerable experience in photographing frescoes, which includes the use of raking light, and Ultraviolet and Infrared applications. Erieta served as Photographer for the Greek Ministry of Culture for the area of Macedonia.

Eleanor Huffman reports that site signs for Chrysokamino, Halasmenos, Kastro, Mochlos and Vronta were installed last year with the aim of improving public access and understanding of these sites. The signs contain photographs, plans, and drawings of finds, and information about the site in both Greek and English. The signs represent a clear way of giving something back to our friends in Crete, an area that has been so hospitable to Americans. Public response has been favorable from both the archaeological community and the local Cretans. So far the signs have held up well against the Cretan sun, wind, and even hunters, though we have discovered that the photographic images are not hardy enough to survive. This year we plan to install more signs at the Mochlos site, as well as at Gournia, Psaira, Vasilike, and the area of Pacheia Ammos.



Antonia Stamos holds Frederick Huyn Smith, son of Angus and Lisa Smith. Frederick was born on October 6, 2000.

We are happy to announce that a donation of \$30,000 has been received to establish the William A. McDonald Petrographic Library at the Study Center. Bill McDonald, who excavated Nichoria, was a pioneer in interdisciplinary research, especially in applying methods developed for the natural sciences to archaeological investigation. The new library will house thin sections of archaeological pottery, and it will make them available for study.



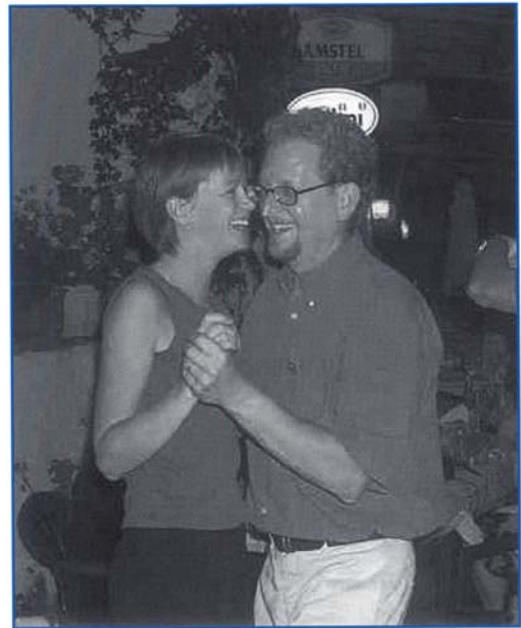
Congratulations to Eleanor Huffman and Manolis Zervakis who celebrated the birth of Georgos John Zervakis on December 6, 2000.

Doug Faulmann, artist for the INSTAP Study Center for East Crete's Publication Team, and Kathy Hall, chief conservator for the Institute of Nautical Archaeology in Bodrum, were married on April 21st of this year. The Study Center celebrated this event with a wedding party held in Mochlos in July, with live Cretan music, delicious food, and the company of many friends and colleagues. We all wish Doug and Kathy many happy years together.

Georgos Serepetsis, in charge of the gardens, grounds, and maintenance at the Study Center, is the proud new father of a little daughter born on May 5, 2001.

Clio Zervakis, conservator at the Study Center, welcomed her new son, Pelopida, named after his grandfather, on February 24, 2001.

Congratulations to Matina Tzari, conservation intern at the Study Center, and Gianni Halkiadakis, who celebrated their marriage on August 24, 2001 in Kavousi.



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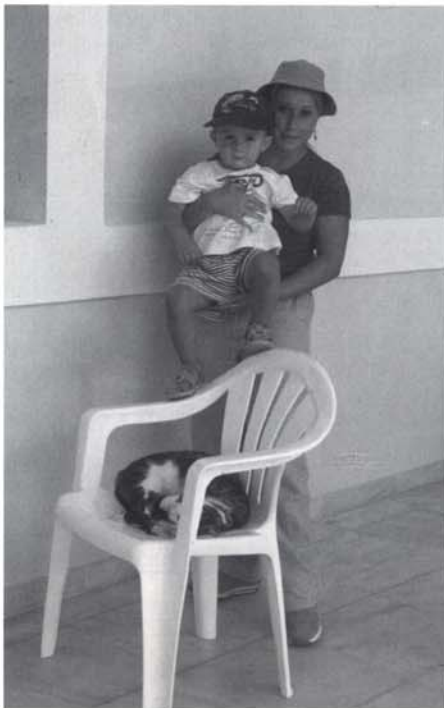
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Doug Faulmann, *Artist*
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| Philip P. Betancourt | Jennifer Moody |
| Leslie P. Day | Margaret S. Mook |
| Cheryl R. Floyd | James D. Muhly |
| Sherry Fox | Ann M. Nicgorski |
| Geraldine C. Gesell | Jeffery S. Soles |
| Donald C. Haggis | L. Vance Watrous |
| Barbara J. Hayden | |

Tommy Brogan, Katerina Koinaki, and Fred
pose in the courtyard at the Study Center.