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Strengthening the Future of Southeast Asian Archaeology:

Investigating Prehistoric Settlement of the Middle Mekong Basin

Report on Year Three

Year of Ceramics

By Joyce White

An interim progress report for the Henry Luce Foundation's Initiative on East and Southeast Asian Archaeology and Early History

Submitted by the

University of Pennsylvania Museum of Archaeology and Anthropology

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Executive Summary

Luce Year Three (July 2010-June 2011) of the University of Pennsylvania Museum's (Penn Museum's) collaborative research program in the Middle Mekong River Basin has achieved several objectives. It has:

- Built upon the substantial infrastructure of archaeological skills, laboratory facilities, and institutional cooperation laid in Years One and Two to focus on studying Southeast Asian archaeological ceramics;

- Added materially to previous knowledge of the prehistory of the region by studying in depth one of the most important ceramic assemblages ever excavated within the Middle Mekong drainage;

- Trained one Thai and one Lao archaeologist in current ceramic analysis, including theory, methodology, and technical analyses;

- Held (jointly with the Smithsonian) the first intensive international workshop on establishing a common methodology for studying archaeological ceramics in mainland Southeast Asia;

- Expanded our regional database of archaeological data, with the analysis and in depth recording of more than 300 ceramic vessels excavated from four sites in northeast Thailand, including Ban Chiang;

- Laid a foundation in terms of personnel, facilities, and data organization for field and laboratory research for the next phase of Luce support and beyond.

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Background

In June of 2008, the University of Pennsylvania Museum was deeply honored to be named a recipient of a four-year institutional research grant from the Henry Luce Foundation, as part of its Initiative on East and Southeast Asian Archaeology and Early History. The grant builds upon the Museum's previous work in Thailand and Laos, particularly the Ban Chiang Project, begun in the mid 1970s, and the Middle Mekong Archaeological Project (MMAP), first conceived in 2001. MMAP is an ongoing collaborative research program of Lao, Western, and Thai scholars, students, and heritage management officials interested in studying the human occupation of the middle reaches of the Mekong River Valley. MMAP was designed in part to create a conceptual and logistical umbrella for the Museum's collaborative research in Laos and northeast Thailand, under the direction of Dr. Joyce White, the Penn Museum's Associate Curator for Asia.

MMAP has two overarching aims. The first aim is to investigate the human prehistoric settlement of the middle reaches of the Mekong Basin in both Laos and northeast Thailand. This research will help archaeologists better understand a key and under-explored region of prehistoric Southeast Asia, and will also throw light on the origins of the Ban Chiang Cultural Tradition. The second aim is to provide archaeological training and institutional capacity building for Lao, Thai, and Western researchers working in mainland Southeast Asian archaeology. The Luce funding is enabling the Penn Museum to pursue both objectives with greatly enhanced rigor and speed, which in turn will positively affect the future of Asian archaeology at collaborating institutions and in the region generally.

Year One (2008-2009) of our Luce-funded program was focused on both training and research goals. A primary objective was to train a team of Lao culture heritage managers and museum professionals in basic archaeological techniques of artifact analysis, recording, survey, illustration, and database creation and management. This was achieved in a seven-week training session in January through March 2009, using a team of Lao, Thai, and Western trainers. The second objective was to continue the regional survey started in 2005 for prehistoric and historic sites in the area around Luang Prabang, northern Laos.

Luce Year Two (2009-2010) built upon Luce Year One, with the emphasis shifting to excavation training at two cave sites, Tham Sua and Tham An Mah. Training included field photography, excavation, plan and section drawing, artifact recording, and continued work with the database. Year Two also included attendance at the 19th Congress of the Indo-Pacific Prehistory Association in Hanoi by several team members, including four Lao and two Thai, who presented papers on MMAP results.

MMAP has now identified 84 archaeological sites in Luang Prabang Province and has test-excavated four cave/rockshelter sites. Excavated materials have revealed much about the stone age and iron age in the region. Additional concrete results from the first two years include the creation of a regional archaeological database, trilingual Lao-Thai-English vocabularies of archaeological terms, and the creation of stone identification and shell identification keys that can be used for years to come by future researchers. The trainees and trainers were also introduced to the use of GIS and field data hand-held recording instruments like the TDS Nomad. One new specialized activity was added during Luce Year Two—speleothem research led by Dr. Kathleen Johnson of University of California at Irvine was part of our continued survey for archaeological sites. The goal of the speleothem study is to reconstruct patterns of ancient climate change during the past 50,000 years. How humans adapted to past climate change is a key topic of inquiry for archaeology today.

The current third year (2010-2011) of the Luce grant to strengthen Southeast Asian archaeology at the University of Pennsylvania Museum has shifted the program's focus from fieldwork in Southeast Asia to laboratory (post-excavation) work in Philadelphia, from Luang Prabang to northern northeast Thailand in geographic focus, and from generalized training of many trainees to in-depth training of a few individuals in specialized ceramic analysis. During this year, two Southeast Asian archaeologists came to the University of Pennsylvania to participate in a two-semester study of ceramics excavated from Ban Chiang, Thailand. The activities and accomplishments of Year Three, known as "The Year of Ceramics", are outlined below.

Luce Year Three: The Year of Ceramics

The Luce Year of Ceramics sought to bring the study of archaeological ceramics in Southeast Asia to a new level of scholarship. It had five key components.

1). A year-long study of ceramic vessels excavated by Penn Museum and the Thai Fine Arts Department at Ban Chiang and three other sites in northeast Thailand, led by a post-doctoral specialist in archaeological ceramics;

2). Participation in the study (as visiting researchers/interns) for eight months by one Thai and one Lao archaeologist;

3). A graduate level, 2 course sequence in the theory and methodology of archaeological ceramics studies at Penn, using Ban Chiang as the case study;

4). Construction and inaugural use of a new archaeological ceramics lab at the Penn Museum;

5). An international workshop co- organized with the Smithsonian to assess the current state of the study of Southeast Asian archaeological ceramics and to explore priorities for the future study of ceramics of Southeast Asia.

Additional activities included collaborations with Penn's Laboratory for Research of the Structure of Matter and the Freer-Sackler Galleries' Science and Conservation Laboratory, database development, and public-access dissemination.

1) The Year-Long Study

The year-long study of Ban Chiang ceramics entailed bringing new expertise to our research program through the hiring of a post-doc with specialized skills. Dr. Marie-Claude Boileau was hired with $60,000 subvention from the Vice Provost's Office for Research as part of Penn's promised cost-share for the Luce grant. As part of her participation in all of the Year of Ceramics (YOC) components, Dr. Boileau brought refreshing insights, new methodologies, and updated theoretical perspectives to the design of the Ban Chiang ceramics study. She has systematized the recording of a series of observations ranging from decorative motifs to how each pot was made and used, thus laying the foundation for future analyses of large ceramic assemblages in the region. Dr. Boileau worked with Dr. Elizabeth Hamilton and Dr. Joyce White in designing the data recording system within the MMAP database, and she supervised coding of the pottery by students and visiting researchers. Our objective is to write, by the end of the summer 2011, a scholarly article that positions the prehistoric pottery of Ban Chiang and Southeast Asia within the context of global archaeological ceramic studies. The outcome of this research will be a peer-reviewed publication (co-authored by Boileau and White) to be submitted to the Journal of Archaeological Method and Theory.

Figure 1. Right, Marie-Claude Boileau describes pot forming of a Ban Chiang pot in the Archaeological Ceramics class. Left, Ban Chiang pottery stored in the sub-basement of the Penn Museum.

2) Visiting Researcher Program

Learning how to do ceramic analysis is a major endeavor, not something picked up during a few weeks in the field. Therefore to build capacity in Thailand and Laos for ceramics studies, the Luce grant for this year brought two visiting researchers, one from Thailand and one from Laos, who already had demonstrated an interest in ceramic studies and who have been long term participants in MMAP. For this period, Luce funds ($50,000) brought Bounheuang Bouasisengpaseuth, Deputy Director from the Lao National Museum in Vientiane, and Sureeratana Bubpha, an instructor from Thammasat University in Bangkok, Thailand, to the Penn Museum for eight months (September 2010-May 2011). They were under the supervision of Dr. Joyce White and post-doctoral ceramics specialist Dr. Marie-Claude Boileau, and they learned and implemented the recording system designed for the Ban Chiang pottery program. To conduct a hands-on examination of vessel after vessel every day, and enter the data into a database may sound tedious, but the skills acquired in the practical application of systematic procedures is the best way for any researcher to advance his or her knowledge of their topic of study. The two researchers also took the two-semester course in archaeological ceramics to gain a general theoretical and methodological perspective on archaeological ceramics. In the second semester of their stay, they took English classes to improve their command of academic English. Both researchers noted that the length of the program was ideal. It afforded them the opportunity to really experience a western academic context and working environment. Observing everything from how American students participate in class to how a major museum exhibition is mounted in addition to their daily tasks of studying Ban Chiang pots cannot be replicated by a short term stay, or by westerners giving a short workshop in Asia.

The two researchers return to their home countries bringing much new knowledge and many new skill sets, and they will surely have an impact on their home institutions.

Figure 2. Left, Marie-Claude Boileau and Bounheuang Bouasisengpaseuth in the new ceramics lab. Right, Sureeratana Bubpha examines a pot in the Ban Chiang Lab.

3) Two-Semester Course in Ceramics Analysis

A key component of the Year of Ceramics at the Penn Museum was the design and offering of a two-semester, multi-departmental course in the study of archaeological ceramics. Professor Tom Tartaron, a Penn archaeologist working in Greece, and Joyce White envisioned this course several years ago with the idea of using Ban Chiang ceramics as the case study for the class. From Penn Museum's point of view, the course provided a vehicle to integrate Museum research into curriculum development at Penn, a university where archaeology is taught in several departments ranging from Anthropology to Art History. From the point of view of the University of Pennsylvania, a unique course was offered that capitalized on the University's special resources in archaeology and science. From the point of view of Luce program objectives, the study of Asian archaeology was integrated into a general archaeological curriculum at a major university. From the students' point of view, they had a once-in-a-lifetime opportunity for an in-depth course on a fundamental archaeological material, ceramics, by studying a world-renowned collection, taught by three professors, Tartaron, White, and Boileau.

A great deal of time and energy from Tom Tartaron, Joyce White, and especially Marie-Claude Boileau was devoted to planning and teaching the two-course, year-long class on Archaeological Ceramics. Introduction to Archaeological ceramics I (Fall 2010;

ANTH 501/CLST 602/AAMW 501) focused on anthropological and archaeological approaches to studying ceramics in past societies with a laboratory component focusing on basic morphological description. Introduction to Archaeological Ceramics II (Spring 2011; ANTH 502/CLST 603/AAMW 502) emphasized laboratory approaches to ceramic analysis in which petrography and other archaeometric techniques are discussed and applied to assemblages of ancient pottery. Dr. Boileau was the primary lecturer during the second semester and was also the laboratory trainer and supervisor, spending many hours during the spring of 2011 patiently demonstrating how to do petrographic analysis and supervising lab projects for the graduate students and the two visiting researchers.

The result of the course was a win-win-win product. Graduate students (16 in the first semester and 10 in the second) came from six different Penn departments (Art and Archaeology of the Mediterranean World, Classical Studies, Ancient History, Anthropology, Near Eastern Languages and Civilizations, and East Asian Languages and Civilizations), one student was from Bryn Mawr College, and two were researchers from Laos and Thailand. Each student had his or her own set of pots from a Ban Chiang burial, which he/she had to write up in a term report using a structured set of observations and methods. For the student, these projects helped ceramics move from something abstract on a PowerPoint slide or in a scholarly article to real objects that each person had specific responsibility for. *"The hands-on experience with the Ban Chiang pottery was fantastic,"* said one student evaluation.

In the second semester, which concentrated on scientific analyses, the students continued using their assigned Ban Chiang pottery to study thin-section petrography and radiographs, ultimately contributing to team papers that were then peer-reviewed in class. Having an archaeological ceramic assemblage that all students were striving to understand gave the class a much richer intellectual and practical experience than if individual students had very different and unrelated assemblages for individual projects. *"I'm grateful for the opportunity to learn the skills offered by this course, which provide the foundation needed for my future research in the area of ceramics in archaeology,"* noted one course evaluation.

Figure 3. Scenes from the Penn class in archaeological ceramics.

4) New Archaeological Ceramics Laboratory

When Penn's original proposal to the Luce Foundation was written in 2007, only the bare bones of the laboratory facilities needed for the course were available at the Penn Museum, and we knew that some facilities improvements would be needed to carry through the Year of Ceramics successfully. In spring 2010 a Museum donor, intrigued with the idea of developing a proper teaching ceramics lab at the Museum that would be used in the coming academic year for a newly designed course, gave $125,000 to the Penn Museum to rehab and equip space in the Museum's West Wing.

Of course laboratories do not set themselves up. During the first semester, Marie-Claude Boileau spent many hours outfitting the new Archaeological Ceramics Laboratory. In consultation with Professor Tartaron, she managed all equipment purchases, purchasing three polarizing microscopes (one research microscope with digital camera and imaging system and two student microscopes), a kiln, two computer workstations, an extensive rock collection with matching thin sections, a Jem saw, reference books and other laboratory consumables and instruments. She coordinated furniture and computer installation with Museum Facilities and IT, and with Hitech Instruments for the microscopes. She established protocols for the use of the lab and microscopes as well as for processing clays from foreign sources and firing experiments.

The lab was up and running for the course's second semester (starting in January 2011) during which scientific analyses, specifically petrography, were the main focus. Many of the class lectures occurred in the lab, with students hovering around rock specimens spread out on the central table and Marie-Claude demonstrating use of the polarizing microscope for identifying minerals. Soon students were spending late nights and weekends in the lab as they worked through lab exercises and the thin sections of their set of pots. The visiting Asian researchers benefited from hours of one-on-one

instruction in petrography by Marie-Claude. The comfort and quality of the new lab facility was an unexpected bonus to the Year of Ceramics program.

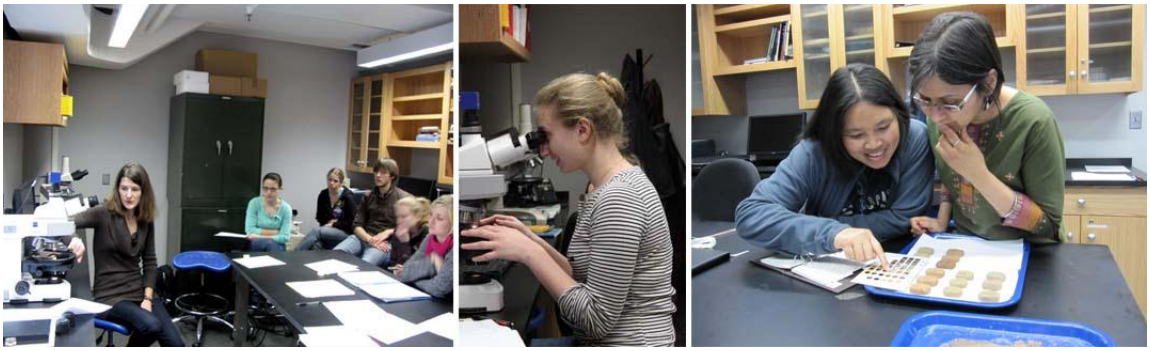

Figure 4: Penn students and interns using the new ceramics lab at Penn Museum.

5) International Workshop on Southeast Asian Archaeological Ceramics

When White envisioned the Year of Ceramics in the proposal to the Luce Foundation, she realized that if the study of Ban Chiang ceramics took place in isolation from the current state of ceramics study in the region generally, it would fail to effect change in the discipline. Somehow the key players in Southeast Asian ceramics studies had to come together, share their knowledge and perspectives, and jointly set the agenda for the advancement of this study.

White also thought that the study of historic as well as prehistoric ceramics needed to be considered so that the full scope of regional ceramics could be integrated. White teamed up with Louise Cort, Curator for Asian Ceramics at the Smithsonian's Freer/Sackler Galleries, to turn the international workshop concept into reality. The Smithsonian approached the Luce Foundation and White wrote the proposal to Penn's University Research Foundation to fund the Workshop. The full funding allowed an extraordinary event to take place.

In early November, thirty invited participants arrived in Washington DC. They came from Australia, Hong Kong, China, France, Thailand, Cambodia, Vietnam, Canada, Laos, Japan, New Zealand, Hawaii and other parts of the US. Over four days— two days at the Freer and two days at the Penn Museum—scholars shared their life experiences in the study of Southeast Asian ceramics, examined the collections at the two institutions, and intensively debated methods, theories, and data. The students from the Penn ceramics course attended the last session on socio-economic perspectives, and saw firsthand how scholars can discuss their differences on methods and paradigms of interpretation. The class had read articles authored by several of the scholars present.

Setting up an international conference with 30 overseas participants requires a great deal of planning, from setting agendas to arranging air tickets and housing. Joyce

White and Louise Cort of the Smithsonian bore the principal burden of this planning, with help from Ardeth Abrams, Marie-Claude Boileau, Elizabeth Hamilton, Beth Van Horn, and the events and planning staff of the Penn Museum and the Freer/Sackler Galleries. Thanks to all this effort, the conference went off smoothly and was considered by the participants to be a ground-breaking contribution to the field.

The airing of many strands of scholarship at the workshop influenced White and Boileau's priorities for the Ban Chiang study. In particular, the several studies including videos of modern potters in the region demonstrated the importance of vessel-wall formation in defining communities of potters. Craft practices such as adding rice to potting clay were also evident. Experimental study of cooking pots showed where soot would accumulate – and similar soot patterns were immediately recognized in the Ban Chiang assemblage. All who attended the workshop were enriched by the experience, and an online listserve sponsored by the Smithsonian was subsequently founded where participants and other interested scholars can continue to share ideas and data. Cort is already organizing a follow-up workshop in Thailand where specialists in kiln archaeology will visit potting villages to observe working wood-firing kilns.

Figure 5. Scenes at the International Workshop in Southeast Asian Archaeological Ceramics.

Other Year of Ceramics Activities

Collaboration with Penn's Laboratory for Research on the Structure of Matter

Current ceramics studies include investigations of chemistry and microstructures that require sophisticated and expensive equipment. As part of the 2nd semester course in archaeological ceramics, classes took place at Penn's Laboratory for Research on the Structure of Matter (LRSM) organized by Dr. Andrew McGhie. Dr. Douglas Yates demonstrated the Scanning Electron Microscope to the class, illustrating its capacity to show prehistoric techniques such as slipping and firing practices, and to provide chemical data for the identification of specific inclusions present in the pots. Steve Szewczyk showed the Penn ceramics class how x-ray diffraction can be used to determine the clay chemistry and mineralogy present in a sherd. His demonstration

showed that prehistoric potters at Ban Chiang were probably mixing clays from different sources during some periods.

Figure 6. Ceramics class at Penn's Laboratory for Research on the Structure of Matter. Left, Doug Yates shows Scanning Electron Microscopy to students and a visiting archaeologist from Laos. Right, Steve Szewczyk explains-ray diffraction to the Penn ceramics class.

Collaboration with the Science and Conservation Laboratory of the Freer-Sackler Galleries of Asian Art, Smithsonian Institution

Another special activity that took place during the Year of Ceramics was x-raying 41 Ban Chiang pots at the Smithsonian Institution. Dr. Boileau took these vessels to Washington for a week in March for study at the Science and Conservation Laboratory at the Freer/Sackler Galleries. There Smithsonian Conservator Blythe MacCarthy taught her how to use their computed radiography facility. The purpose of such study is to further elucidate the vessel construction methods of the ancient potters beyond what can be seen macroscopically. X-rays can show vessel seams and other formation features not visible on the vessel surface to the naked eye. Studies from the 1980s showed that the Ban Chiang pottery had many different construction techniques. The importance of vessel forming techniques in development and sharing of ceramic technology was one of the clearest results from the International Workshop. It is also one of the most under-studied aspects of ancient ceramic technology, and one of the most promising contributions of the Ban Chiang study to ceramic archaeology.

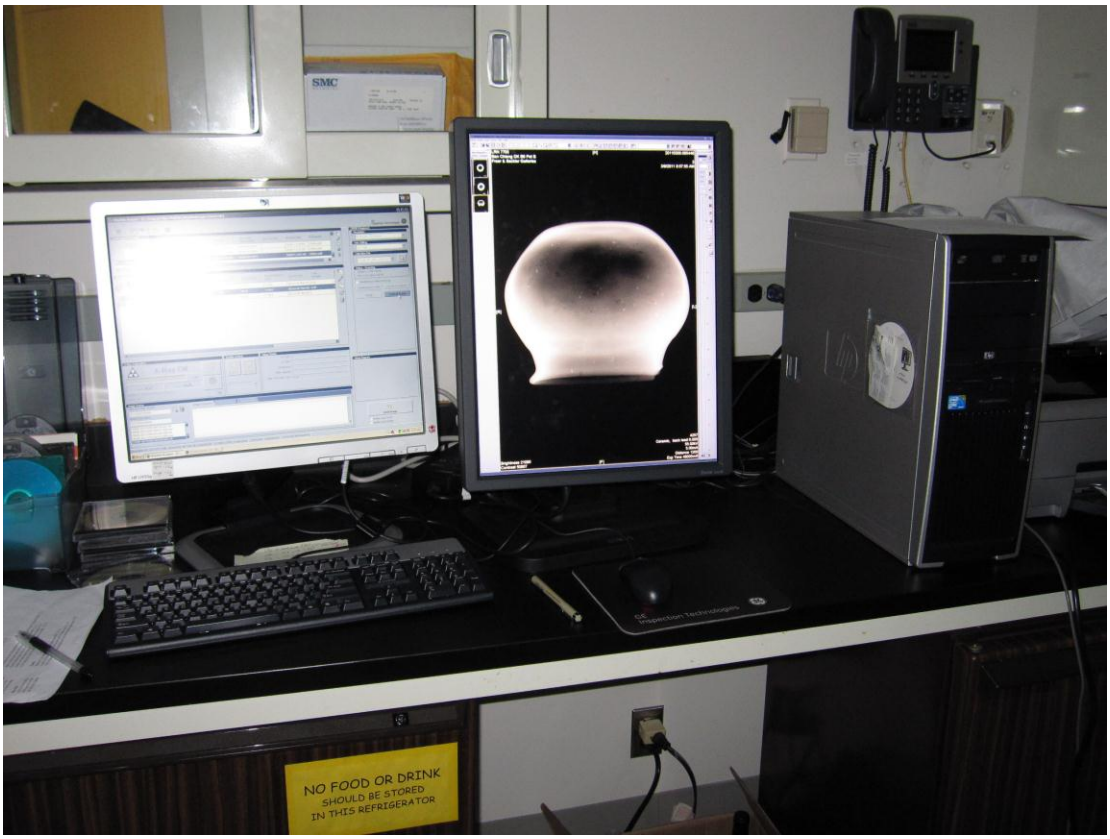

Figure 7. Computed radiographic image of a prehistoric pot excavated by Penn in Thailand. Picture taken at Science and Conservation Laboratory of the Freer-Sackler Galleries of Asian Art, Smithsonian Institution, March 2011.

Database Development

Although not glamorous to the outsider, database development is a core component of the Ban Chiang Project's long term objectives, and it is also key to Ban Chiang's contribution to the Penn Museum's Digital Spine initiative.

During Luce Year Three, work on the Project databases continued under the direction of Dr. Elizabeth Hamilton, with a focus on integrating the data from the four Ban Chiang Cultural Tradition sites excavated by Penn in the 1970s with the MMAP data collected from Luang Prabang since 2001. The long term goal is to create a comprehensive regional Middle Mekong database that can be used not only by MMAP, but also be disseminated among other Southeast Asian scholars.

During the Year of Ceramics, major advances were made to our research database, including reorganization of its architecture and addition of new data. Aspects of its internal structure that had been suitable for its use during our fieldwork in Laos were cumbersome for its use here at Penn. Dr. Elizabeth Hamilton transformed its organization into a server-based database so that the data reside securely on a server

in the Penn Museum IT department, but these data can be accessed from several table top computers in the Ban Chiang Lab. The Year of Ceramics was the catalyst for this re-organization because several individuals would be entering data on pottery simultaneously.

As the year progressed, the number of fields that Joyce White and Marie-Claude Boileau wanted for pottery grew from a handful to over 100 fields on all aspects of ceramics: shape, dimensions, color, fabric, forming, finishing, decoration, use, and post-depositional events. Instead of the traditional archaeological emphasis on shape and style, these fields reflect an emphasis on details of ceramic technology and manufacture. The making of the associated tables, forms, and subforms was quite complex, especially because new details need to be added every week. Dr. Hamilton also handled troubleshooting of the use of the database by our Southeast Asian trainees/researchers. Although any product this complex requires oversight and maintenance, we are extremely pleased with how well the database works and how readily it can be adapted to new demands made on it. Bounheuang and Sureeratana coded nearly 300 pottery vessels, leaving a little more than 200 vessels to code this summer.

We also made important additions to our digital image database. In the Fall of 2010, Ardeth Abrams trained visiting international researchers, Sureeratana Bubpha and Bounheuang Bouasisengpaseuth to scan and archive ethnographic pottery production slides and then add the scanned images to our digital image archive project database. The additions and changes in both the image and research databases facilitate their eventual incorporation into the Penn Museum’s Digital Spine.

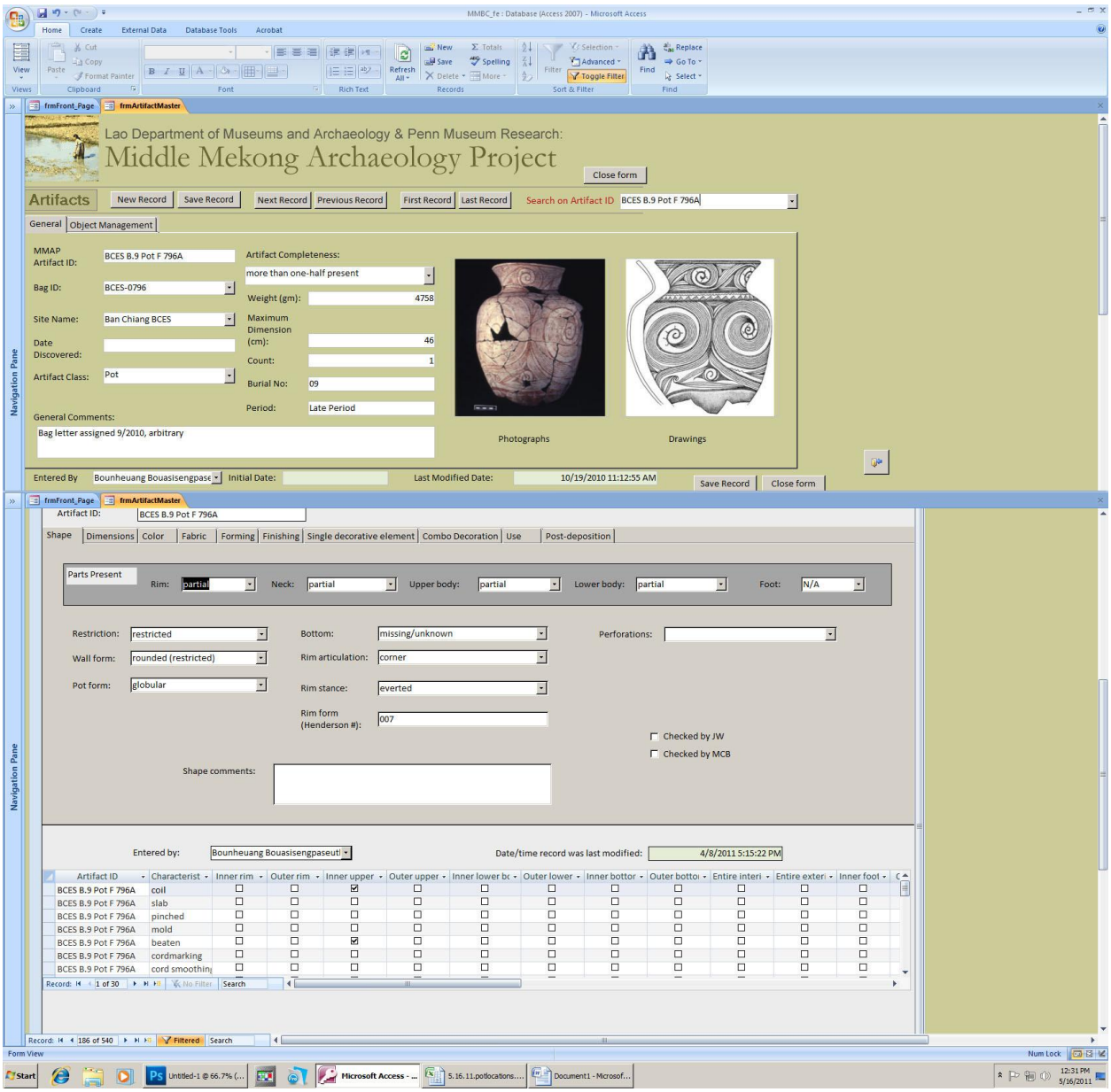

Figure 8. Screen shot of page one in the data entry form for Ban Chiang pottery.

Public-access Dissemination

Information on the Year of Ceramics has been made public both on the Penn Museum's Ban Chiang website and in the Ban Chiang annual newsletter. Ardeth Abrams, with assistance from volunteer Beth Van Horn, drafted and designed most of the public media materials. Several Year of Ceramic web pages and slide shows have been

posted on the Ban Chiang website (http://penn.museum/banchiang/2010/year-of-ceramics). Ardeth also facilitated the drafting and posting of bilingual blogs from our visiting researchers Sureeratana Bubpha (English and Thai) and Bounheuang Bouasisengpaseuth (English and Lao). These blogs have appeared on the Penn Museum's website in the spring of 2011 (Bounheuang's http://penn.museum/blog/author/bounheuang and Sureeratana's http://penn.museum/blog/author/sureeratanabubpha).

Another Year of Ceramics product is the online posting in the Penn Museum's Southeast Asian Scholarly Archaeology Website of several of our multi-lingual vocabulary tables. During Luce Year One (2008) MMAP started trilingual word lists of basic vocabulary for archaeology with English, Thai, and Lao languages. At the International Ceramics Workshop in November, participants applauded the idea of development of word lists for ceramic studies, and some volunteered to add Khmer, Vietnamese, and Japanese. We plan to update these wordlists continually. They are available at

http://seasia.museum.upenn.edu/Vocab_Intro.html

Vocabulary for Excavation

ຄຳສັບກ່ຽວກັບການຂຸດຄົ້ນ

คำศัพท์เกี่ยวกับการขุดค้น

វាក្យសព្ទកំណាយបុរាណវិទ្យា

English	Lao	Thai	Khmer
Excavation	ການຂຸດຄົ້ນ	การขุดค้น	កំណាយបុរាណវិទ្យា
Excavate	ຂຸດຄົ້ນ	ขุดค้น	ធ្វើកំណាយ
Site	ແຫລ່ງບູຮານວິທະຍາ	แหล่งโบราณคดี	ស្ថានីយ៍បុរាណ
Pit	ຂຸມຂຸດຄົ້ນທາງບູຮານວິທະຍາ	หลุมขุดค้นทางโบราณคดี	រណ្ដៅកំណាយ
In Situ	ຕຳແຫນ່ງຫລັກຖານທຳອິດທີ່ພົບເຫັນ	ตำแหน่งเดิมที่พบหลักฐาน	រកឃើញនៅនឹងកន្លែង

Figure 9. Example of part of a multi-lingual word list for archaeological vocabulary in four languages posted on Penn Museum's Southeast Asian Scholarly Website.

People and Facilities

Two of the Luce Program's objectives are greater exposure of Asian archaeology to many audiences and integration of its scholarship into general archaeology. To implement these objectives, the Penn Luce Program has sought to bring together archaeologists and heritage managers of diverse backgrounds and interests in a series of environments designed for mutual learning. The first two years of the Penn program sought to create the learning environments in Laos. This served the objective of helping to develop collaborative interaction in Asia. Our third year was more about engaging a western context, the University of Pennsylvania, with Asian Archaeology, in addition to intensive training of a few Asians. Thus to do this, the location of our endeavors shifted from Southeast Asia to North America and from field research to laboratory analysis.

Personnel

The number and names of individuals touched by our Luce Year Three Endeavors are impossible to fully enumerate. Through Year of Ceramics activities, several old faces and many new faces came into the orbit of Southeast Asian archaeology at Penn Museum, even if just for a few days. Long time Ban Chiang Project team members, Joyce White, Elizabeth Hamilton, and Ardeth Abrams, provided "ballast" and continuity with the project as a whole. In addition to their regular roles, they aided in tasks to support our international scholars ranging from getting social security numbers, escorting scholars to doctor appointments, to filling out income tax forms. Our post-doc Marie-Claude Boileau, and Professor Tom Tartaron of the Classics Department at Penn were the teachers along with Joyce for the course in which Ban Chiang was the case study; Joyce and Marie-Claude also served as trainers for our visiting Southeast Asian researchers. Bounheuang Bouasisengpaseuth and Sureeratana Bubpha spent eight months here at Penn learning about archaeological ceramics analysis and coding Ban Chiang pots for the database. Fourteen graduate students from Penn and Bryn Mawr, in addition to Bounheuang and Sureeratana, took the first semester of the archaeological ceramics course, and eight attended the second half. Dr. Elizabeth Hamilton served as database manager and trainer, and Jenny McAuley, a Penn undergraduate, was our pottery collection manager.

The International Workshop on Southeast Asian Ceramic Archaeology also brought 30 scholars from around the world to Penn Museum in November for intensive days of discussions and hands-on examination of Ban Chiang pottery. Students from the ceramics course attended some sessions, witnessing debate among scholars whose publications they read in class. Collaborating scholars from the Smithsonian and Penn's LRSM also engaged with Ban Chiang archaeology during the year. All in all, it seemed like the Ban Chiang Lab was in a continuous buzz of liveliness from all the comings and goings of students and scholars.

These kinds of intensive experiences that are both intellectual and personal tend to reverberate long after the last visitor has returned home. Individuals share with their peers and family even just a few details of their experience, and the archaeology of Thailand and Laos reaches another audience.

Summary of Project Outcomes

The presentation above noted many Year Three activities that contributed to concrete as well as intangible outcomes. A brief review of this year's tangible products is provided below.

Databases

Major strides forward occurred during Luce Year Three with regard to our **regional database**. With the assistance of Dr. Marie Claude Boileau, a sophisticated data collection and recording system for ceramics was developed and refined. Dr. Elizabeth Hamilton designed and incorporated a ceramics component into our regional Access database and made it accessible on the Ban Chiang Local Area Network. Thus the visiting researchers entering data on the Ban Chiang pottery could each work at different computers and enter data simultaneously. Three hundred pots were recorded. This advancement of the database will help prepare it for eventual world wide web accessibility, one of the goals of the Penn Museum's Digital Spine initiative.

Our **image database** was also expanded with nearly 500 images added in the past year. The additions were mainly images of ethnographic pottery manufacturing in Thailand with photographs taken by Chester Gorman and Joyce White of pottery making from about 30 years ago.

Our **online bibliographic database** has 1000 new records for the year including extensive references concerning ceramic archaeology generally and also ceramics specifically of Southeast Asia. This online bibliography was established as part of the Luce Foundation grant to Penn Museum in the 1990s. It is used by archaeologists around the world, and is especially appreciated by those in developing countries who have limited access to research libraries.

We have also posted on Penn Museum's Southeast Asian Archaeology Scholarly website, a password-protected **MMAP archive** and multi-lingual **vocabularies for archaeology** and related disciplines.

Reference Collections

The new ceramics lab has the beginning of several important reference collections. Not only is there an extensive rock reference collection with supporting thin sections, but the 90 new thin sections of Ban Chiang and related ceramics, including experimental

ceramics made for the class, will be housed there, as well as samples of potting clays from Thailand and other soils. We expect that ultimately several hundred thin sections from Ban Chiang and other sites in Thailand will be housed here, providing a research collection of thin sections from Thai ceramics for future studies.

Pottery records for the Ban Chiang ceramics also have been systematized as we conducted the analysis. These records are important not just for research, but for tracking the loan of material from the Government of Thailand, and for our own Museum records of collections housed at the Museum. The records will facilitate the eventual return of collections to Thailand.

Public Relations

Products for purposes of informing general audiences about Luce Year Three activities have emphasized online media. The Year of Ceramics webpages at

http://penn.museum/banchiang/2010/year-of-ceramics/

include three slide shows, and several blog postings. These postings have facilitated informing our peers and friends from around the world what Penn Museum has been doing these past several months. We have also produced a Friends of Ban Chiang annual newsletter that features our Luce grant supported acitivities.

Institutional Development and Collaboration

University of Pennsylvania

Under Director Richard Hodges, the Penn Museum has designated Ban Chiang as one of the Museum's 'five key long-term research locations.' The Luce grant has enabled Penn Museum to actualize its commitment to Ban Chiang research particularly in this third year. The grant created a structure by which different parts of the University of Pennsylvania synergized, with the end product advancing the study of Ban Chiang, a UNESCO World Heritage Site. The Provost's Office for Research, the Laboratory for Research on the Structure of Matter, as well as several academic departments that collaborated in creating the course in archaeological ceramics that studied Ban Chiang, all were involved in some part of the Year of Ceramics, making it a great institutional success. Without their involvement and investment, the Year of Ceramics could not have been accomplished. And it is difficult to imagine how these considerable institutional resources could have been marshaled without stimulus from the Luce Grant. Two products of this institutional synergy are a new research laboratory for Penn Students at the Museum, and cross-departmental curriculum development in archaeology.

Smithsonian's Freer/Sackler Galleries

Another Penn Museum collaboration that developed further from the Year of Ceramics is with the Smithsonian's Freer/Sackler Galleries, its Conservation Department, and the Asian Ceramic Curator, Louise Cort. This collaboration facilitated the international workshop in Southeast Asian ceramics as well as radiographic analysis of Ban Chiang pottery ("free" but valued at more than $10,000), and led to the establishment of a listserve of those interested in Southeast Asian ceramics..

Next Steps

The third year of the Luce Foundation grant to Penn followed closely the original plan for this year as laid out in Penn Museum's proposal. All of the activities, programs, experiences, facilities development not only occurred as proposed, but in many cases exceeded the objectives envisioned. For example, the new teaching ceramics laboratory that was built in the Penn Museum in time for use in the graduate ceramics course that used Ban Chiang as a case study was not even conceived of at the time of the proposal, but grew synergistically from the momentum built by the Luce program. Only one objective of Joyce White's, namely the completion of the Ban Chiang ceramics analysis, was not finished, although the program of ceramics analysis is now very advanced.

As it became evident to White that more time would be needed to complete the Ban Chiang ceramic study, and as a full explication of the Ban Chiang ceramic sequence is a cornerstone of the Luce Year Four program, White has sought funding to continue to employ Dr. Marie-Claude Boileau for an additional year in order to complete the ceramics study. Special targeted donations to Friends of Ban Chiang, Ban Chiang Endowment income, and other Penn Museum sources now have been allocated for a one-year extension of her study.

Request for one year postponement of Luce Year Four

The ceramics study taking place at Penn Museum that will lay the foundation for Luce Year Four is not yet complete. Although the majority of Ban Chiang vessels in the Penn collection have been studied, the full analysis will not be complete for another year.

In order to complete the study, a one year postponement of the Luce Year Four increment is requested from the Luce Foundation. During the proposed one year hiatus in Luce funded programing, the Ban Chiang Team plans to complete the manuscripts for two monographs, one on the ceramics and one on the Ban Chiang metals. The metals monograph is already about 85% complete. A Luce Foundation grant to the Ban Chiang Project in the 1990s supported Drs. Elizabeth Hamilton and Joyce White in completing the metals study and drafting most of the manuscript. This requested one year hiatus in the current Luce program for 2011-2012 will allow us to have a "Year of

Monographs" and tackle in a focused manner these two publications that are fundamental to the scholarship of Southeast Asian archaeology. Drs. White, Hamilton, and Boileau, Dr. Brian Vincent in New Zealand, and other collaborators will be able to work together using the data and analyses that have accumulated over years to complete these major publications

The ceramics monograph will provide the data underpinning a regional ceramics sequence, which is the primary tool archaeologists use to enable chronological positioning of identified sites based on surface collections of artifacts. This regional ceramics sequence is needed for the survey to be conducted in the Ban Chiang region of northeast Thailand to record known sites into our already-established MMAP GIS database. The lack of a comprehensive ceramic typology for this important region of human prehistory has greatly hampered the study of settlement patterns for the Ban Chiang Cultural Tradition. The Thai and the Lao researchers participating in the Luce Year Three analysis will also participate in the Luce Year Four survey, ensuring continuity of scholarship and training from lab to field.

Luce Year Four: Ban Chiang Area Settlement

The fourth and final phase of the Luce-sponsored collaborative research program was conceived in the original proposal as a year when the ceramics data organized from Luce Year Three would be applied to site-assessments during a regional survey in northern northeast Thailand. As previously, archaeologists from Thailand, Laos, the U.S., and other developed and Southeast Asian countries will collaborate on this "crossing borders" endeavor as the study of the right bank of the Mekong in Thailand complements the left bank study that had been the focus of Luce Years One and Two.

The major activities and budget for Luce Year Four remain unchanged from the original proposal. The budget is to support a large regional survey including the personnel, technical equipment, and transportation needed to undertake the design. The only change envisioned at this time is the delay of one year for the Year Four endeavor.

Summary

The Luce funding of a four-year expansion and enrichment of the Penn Museum's research in Southeast Asia is enabling both the training of regional archaeologists and the incorporation of methodologies that would otherwise have been impossible. Techniques that have rarely been applied in mainland Southeast Asia, such as ceramic petrography, residue analysis, palaeoethnobotany, shell analysis, and speleothem research, promise to address important questions in the area's prehistory, including the origins of agriculture, the nature of hunter-gatherer adaptation to tropical environments, and the nature of early villages like Ban Chiang. Although it is not yet clear if we will be able to resolve conclusively such questions as how the Ban Chiang cultural tradition

emerged, this Luce-funded work will inevitably expand knowledge of the human occupation of one of the world's great rivers.

While a hiatus in the Luce grant period for the Penn Museum is requested, the activities planned for the hiatus year actually will enable the overall Luce support for Southeast Asian archaeology at the University of Pennsylvania to be more fully realized. Publications and studies fostered by the current and previous Luce grants that have not quite been completed will be brought to fruition. These products are important obligations for the Penn Museum's scholarship in Southeast Asia. Without the pause to attend to these efforts, there is a possibility of the loss of these important contributions to knowledge.

The overall Penn Museum program that combines collaborative research with progressive training has enabled productive relations and collegiality to be maintained and expanded, laying the groundwork for future regional programs in archaeological research, publication, and presentation in Southeast Asia. One key aspect of the success of the Luce program at Penn Museum is the substantial periods White and other staff have been able to spend in Laos, and now the substantial period two Asian archaeologists have been able to spend at Penn. To bridge the language and educational differences between international and country level archaeology, much sustained face-to-face time is needed to transmit knowledge and techniques with an enduring result. The building of "human capital" not only in Laos and Thailand but also at Penn Museum in the areas of cultural heritage management, archaeology, and museum studies through our training programs will have a long-term impact on both sides of the globe. Luce Foundation funds have been instrumental in advancing Luce objectives of strengthening the next generation of professional Southeast Asian archaeologists while simultaneously fostering dissemination of new data and knowledge of the past.