PERSEPOLIS FORTIFICATION ARCHIVE PROJECT

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The Persepolis Fortification Archive is a treasury of information about the languages, society, institutions, religion, and art of the Achaemenid Persian Empire at its zenith, around 500 BC. Its value depends on a combination of complexity (the archive contains detailed information of many different kinds) and integrity (the archive is an excavated artifact, a single, coherent cache of tens of thousands of documents from a single time and place).

The legal crisis that puts the future of the many Persepolis Fortification tablets in doubt also endangers the integrity of the single Persepolis Fortification Archive. The suit is still before federal courts, and the threat remains grave and persistent, but while the law takes its stately course, the Persepolis Fortification Archive Project pursues its emergency priorities: to enable future research by making thorough records of the archive, and to enable current research by distributing the records freely and continuously.

During 2009–2010, Clinton Moyer (PhD 2009, Cornell), Joseph Lam (PhD candidate, NELC), Miller Prosser (PhD candidate, NELC), and John Walton (PhD candidate, NELC) continued to operate the two Polynomial Texture Mapping (PTM) domes and the BetterLight scanning camera, making very high-quality images of selected Fortification tablets and fragments
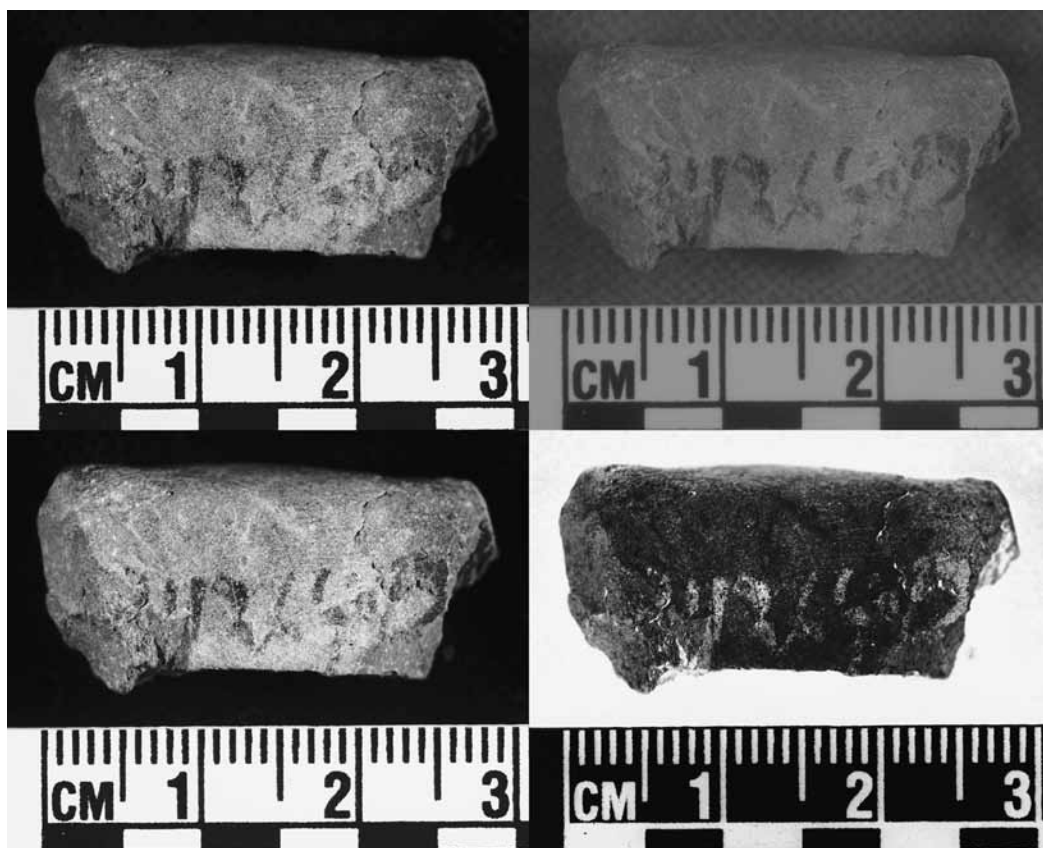

Figure 1. Four BetterLight scans of a fragmentary Persepolis Fortification Aramaic tablet (PFAT 684). Clockwise from upper left: polarized light, infrared filter, negative tone scale, red filter

(fig. 1). As of mid-2010, this phase of the project — a collaboration with the West Semitic Research Project (WSRP) at the University of Southern California — has captured images of about 2,600 items: more than 670 monolingual Aramaic tablets, more than 200 Aramaic epigraphs on tablets with Elamite cuneiform texts, about 1,500 sealed, uninscribed tablets, and about 200 Elamite tablets and fragments.

The range of imaging techniques, the range of detail that they reveal, and the rate of output from this phase of the project grow with experience. Making the images outruns processing them for display, so two PTM-image processing stations have been added at the Oriental Institute to supplement post-processing done at the University of Southern California. Despite the duct-tape and baling-wire look

Figure 2. Wear and repair on one of the PTM domes

of the PTM domes (fig. 2), their reliability is outstanding: the shutters of the cameras on the two PTM domes have tripped more than 1,000,000 times during the life of the project.

Manning the post-processing stations are some of the crew who are also making and editing conventional digital images of the largest component of the Persepolis Fortification Archive, the Elamite Fortification tablets and fragments. During the past year, this group included Lori Calabria, Jon Clindaniel, Gregory Hebda, Will Kent, Megaera Lorenz, Tytus Mikołajczak, and Lise Truex (all NELC), Joshua Skornik (Divinity School); Anastasia Chaplygina (MAPH); Nicholas Geller, Amy Genova, Erika Jeck, and Daniel Whittington (Classics); and returning Persepolis Fortification Archive Project alumnus Trevor Crowell (Catholic University). Three photography and editing stations are in use now, and so far this phase of the project has made about 50,000 images of about 4,000 tablets and fragments with Elamite cuneiform texts. Editing these pictures for display now runs ahead of taking them, so the backlog is shrinking. Older picture sets are being checked and reshot as necessary for completeness and to match the higher standards of the later sets that reflect the photographers' accumulated experience. Haphazard file names from earlier picture sets are being made consistent with later sets, to facilitate linked online display and to prepare metadata for long-term storage.

After two more extended visits to the Oriental Institute, Persepolis Fortification Archive Project editor Wouter Henkelman (Free University of Amsterdam and Collège de France) has finished revised, collated, and annotated editions of about 2,400 of the 2,600 Elamite texts known from preliminary editions by the late Richard Hallock (called NN texts). He expects to collate the

remainder in the summer and autumn of 2010 and to furnish complete translations in preparation for online distribution and hard-copy publication. I have continued to make preliminary editions of new Elamite Fortification texts, concentrating on document types that are underrepresented in the published sample of the Persepolis Fortification Archive; as of mid-2010, I have recorded about 585 of these.

The second largest component of the Persepolis Fortification Archive consists of uninscribed (anepigraphic) tablets (PFUT or PFAnep), that is, tablets with seal impressions but without accompanying texts. Our first estimates of the number of useful pieces of this kind were too low. During nine trips to the Oriental Institute during the past year, Persepolis Fortification Archive Project editor Mark Garrison (Trinity University) systematically examined another 25 percent of the 2,600 boxes of Fortification tablets and fragments to select uninscribed tablets for cataloging and PTM imaging. Now that about half of the boxes of tablets have been sifted, more than 2,100 uninscribed tablets have been selected for study. Post-doctoral researcher Sabrina Maras (University of California–Berkeley) is cataloging this material under Garrison's direction, a process that involves identifying impressions of previously known seals, assigning numbers to new seals, and sketching impressions of them; during the summer of 2010, she is joined in this work by graduate student Jenn Finn (University of Michigan). The results continue to bear out the general observation that some seals used on uninscribed tablets were also used on Elamite or Aramaic Fortification tablets, but most — around ten times as many — were not: on 275

Fort. 0276-101   1 cm

*Figure 3. Impression of a newly identified inscribed seal in Assyrian style accompanying
a newly edited Elamite text of an underrepresented type*

cataloged tablets, there are impressions of more than thirty seals previously known from tablets with Elamite texts, but there are also impressions of 300 new seals. Garrison also continues to read the seals on the NN tablets. As of mid-2010, he has identified seal impressions on almost half of the NN tablets, and about 1,250 tablets that have yielded impressions of another 465 previously unknown seals. Post-doctoral student Wu Xin (Institute for the Study of the Ancient World, New York) is documenting some of this material under Garrison's direction.

All told, impressions of about 2,500 distinct seals have been cataloged on Persepolis Fortification tablets so far, the markers of as many distinct individuals and offices. Even if new seals are identified at a slower rate as work continues, the Persepolis Fortification Archive is certain to yield one of the largest coherent sets of images from anywhere in the ancient world.

The third main component of the Persepolis Fortification Archive consists of tablets with texts in Aramaic, some 670 identified to date. Persepolis Fortification Archive Project editor Annalisa Azzoni (Vanderbilt University) made two extended trips to the Oriental Institute during the past year to work on them. She has examined, numbered, cataloged, and made preliminary editions of about 100 monolingual Aramaic tablets and about 110 of the 200 Aramaic epigraphs on Elamite tablets identified so far. She is developing a formal typology of the documents to allow consistency with work on the Elamite texts and to clarify functional connections among streams of data recorded in Aramaic and in Elamite. Graduate student Emily Wilson (Classics), working under the direction of Persepolis Fortification Archive Project editors Elspeth Dusinberre (University of Colorado) and Mark Garrison, has been completing Dusinberre's collated draw-ings of seals on the Aramaic tablets and entering new descriptive and cataloging data on the PFAT seals in the On-Line Cultural Heritage Research Environment (OCHRE, http://ochre.lib. uchicago.edu).

*Figure 4. What the seals show that the texts do not: PTM views of altar scenes
from seal impressions on four uninscribed fortification tablets*
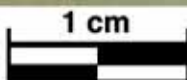
PF-NN 1478

1 cm

Figure 5. What the seals tell about the seal users: among 2,500 seals identified so far in the PFA, only four show scenes of human warfare; here, a Persian archer shoots a Scythian warrior in the seal impression on an Elamite Fortification tablet

Persepolis Fortification Archive project manager Dennis Campbell (post-doctoral student, Oriental Institute) coordinates, connects, and smoothes data and images for presentation via OCHRE. Oriental Institute Internet data specialist Sandra Schloen has prepared a revised version of OCHRE's display of Persepolis Fortification Archive material that includes a range of options for viewing and combining texts, translations, glossaries, grammatical information, and seals, displayed with a new look and feel. Lying behind this display are improved tools for importing texts and glossing and parsing them, hotspotting images, and linking images to texts — all processes that are increasingly automated as the corpus of information in OCHRE grows. Graduate student Seunghee Yie (NELC) imports Elamite texts into OCHRE and prepares editions for export to other sites (notably the Cuneiform Digital Library Initiative [CDLI], http://cdli.ucla.edu); graduate student Wayne Munsch (Divinity School) tags and links photographs, transliterations, and grammatical parse of Elamite Fortification documents.

More than 20,000 conventional and high-quality digital images, more than 7,000 low-resolution PTM sets, more than 3,200 editions of Elamite texts, and 100 editions of Aramaic texts, drawings, and analytical information on more than 650 new seals and a catalog of about 1,100 previously known seals have been entered in OCHRE in preparation for public display. As of mid-2010, about 1,400 Fortification tablets are publicly available on OCHRE, including 1,250 Elamite tablets presented with transliterations, many with translations, and all with click-through glossary and morphological parsing, conventional photographs (many of them tagged and linked

Figure 6. Two views of an Aramaic Fortification tablet: left, PTM image highlighting seal impression; right, BetterLight scan with red filter, highlighting inked text

Figure 7. OCHRE display of an Elamite Fortification tablet, text, translation, and seal impression

to transliterations), seal analysis, and other options; 40 Aramaic tablets, presented with transliterations, translations, seal information, click-through glossary and parse, and high-quality images, including screen-resolution PTM images that allow the viewer to control the lighting on screen; and 110 uninscribed, sealed tablets with cataloging information, some collated drawings, and high-quality images, including live screen-resolution PTM imagery.

The West Semitic Research Project (WSRP) team at the University of Southern California presents images of Persepolis Fortification tablets via their online application InscriptiFact (http://www.inscriptifact.com). Publicly available there as of mid-2010 are about 15,000 images of about 525 Persepolis Fortification tablets, including 400 Aramaic and 100 uninscribed tablets. In the spring of 2010, InscriptiFact released a new version that incorporates a robust online viewer for high-resolution PTM imagery. This allows users to manipulate apparent lighting (direction,

Figure 8. Antiquity at Persepolis: three views of the seal impression and Aramaic epigraph on reverse of an Elamite Fortification tablet (PF 2026), displayed in Inscriptifact. Left: static views with polarized light and infrared filter; right, high-resolution PTM image. The Old Babylonian seal was more than 1,000 years old when it made this impression

intensity, and focus of one light or two) and apparent surface reflectivity and to compare PTM views with one another and with high-resolution static images. The viewer and the PTM files can also be downloaded for local use.

Efforts to promote awareness of the plight of the Persepolis Fortification Archive, the unique qualities and value of the Persepolis Fortification Archive, and the aims, methods, and results of the Persepolis Fortification Archive Project included a panel at the annual meeting of the Archaeological Institute of America in January 2010, with presentations by me and by Persepolis Fortification Archive Project members Annalisa Azzoni, Dennis Campbell, Elspeth Dusinberre, and Mark Garrison, along with WSRP collaborators Marilyn Lundberg and Bruce Zuckerman (USC). A panel at the annual meeting of the American Oriental Society honoring the Achaemenid historian (and member of the Persepolis Fortification Archive Project's international advisory board) Amélie Kuhrt included papers by me and by project editors Garrison and Henkelman, and one by graduate student Persepolis Fortification Archive Project worker Tytus Mikołajczak. As *professeur invité* at the Collège de France in Paris in November 2009, Garrison gave four lectures on the glyptic art of the Persepolis Fortification Archive, drawing on recent project results. Azzoni lectured on the Persepolis Fortification Archive and the project at the Warren Center for the Humanities at Vanderbilt University, and at Baylor University. Dusinberre presented a talk on the Persepolis Fortification Archive at the Boulder, Colorado, Society of the Archaeological Institute of America. I talked about the Persepolis Fortification Archive and the project in and around Chicago at the Harvard Club, at the University of Chicago Humanities Day, at Wheaton College, at the Illinois Institute of Technology, at the Franke Institute for the Humanities, and at the Midwest Faculty Seminar; farther afield I talked at an event organized by Friends of the Persepolis Fortification Archive Project in Palo Alto (a video of the talk is available at

Figure 9. Athenian owl in Persepolis and California; title slide of PFA Project panel at 2010 meeting of the Archaeological Institute of America: an Athenian tetradrachm impressed on an uninscribed Fortification tablet, and the same image incorporated in the emblem of the AIA

http://www.youtube.com/watch?v=fv-o5qbwY8Q), at Berkeley, at the New York University Humanities Institute, at the University of Pennsylvania, at a symposium of the American Institute of Iranian Studies in New York, and at the British Museum. At Johns Hopkins University, I had the honor of devoting the annual W. F. Albright Memorial Lecture to the Persepolis Fortification Archive Project. At Oxford University, I described our methods and experience to the staff of an Oxford-Southampton pilot project using PTM imaging to record ancient artifacts.

For the worldwide online audience, the Persepolis Fortification Archive Project Weblog (http://persepolistablets.blogspot.com) provides access to articles from scholarly and news media about the archive, the lawsuit, and topics in Achaemenid archaeology and epigraphy: thirty-six entries were posted in the last year. Persepolis Fortification Archive Project editor Charles Jones (Institute for the Study of the Ancient World, New York) reports that the blog has been viewed more than 18,000 times in the last year, by more than 12,000 unique visitors, more than 1,800 of them repeat visitors. It has been viewed almost 70,000 times since it debuted in October 2006.

The University News Office released a new press release on the project's collaboration with WSRP in recording the Aramaic Fortification texts (http://news.uchicago.edu/news.php?asset_id=1732), with an accompanying video (http://www.youtube.com/watch?v=_iE0Pu-K0ss). Online journalistic accounts focus on the archive's legal situation and its broader implications for other cultural artifacts; examples are an article in the Phi Beta Kappa Society's Key Reporter by a lawyer working at Corcoran and Rowe, the firm representing Iran in the litigation (http://www.pbk.org/userfiles/file/flashversion/Spring2010/pageflip.html), and an article in the online journal of the U.S. State Department, America.gov (http://www.america.gov/st/peopleplace-english/2010/June/20100601093040cjnorab0.5233881.html).

Persepolis Fortification Archive Project editorial staff (Azzoni, Dusinberre, Garrison, Henkelman, Jones, and Stolper) prepared an entry for the *Encyclopaedia Iranica* on "Persepolis Administrative Archives," providing an authoritative description of the Persepolis Fortification and Treasury Archives and an extensive bibliography of current scholarship on them. Images, texts, analysis, and other current results also appear in a stream of publications by project staff and their collaborators, for example, "Seals Bearing Hieroglyphic Inscriptions from the Persepolis Fortification Archive" by Mark Garrison and Oriental Institute Egyptologist Robert Ritner, and "The First Achaemenid Administrative Document Discovered at Persepolis" by Charles E. Jones and Seunghee Yie, both in *ARTA: Achaemenid Research on Texts and Archaeology* (see http://www.achemenet.com/document/2010.002-Garrison&Ritner.pdf); "Archers at Persepolis," by Mark Garrison, in *The World of Achaemenid Persia*, edited by J. Curtis and St. John Simpson (London, 2010); and "New Observations on 'Greeks' in the Achaemenid Empire," by Wouter Henkelman and Robert Rollinger, and
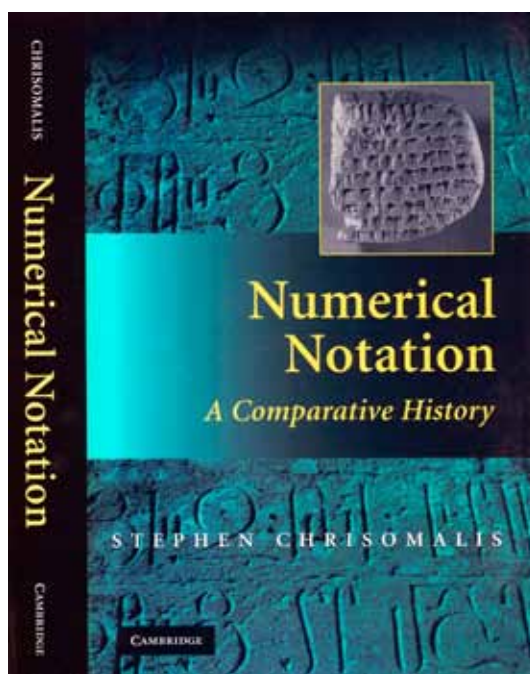
Figure 10. Old Persian tablet from the Persepolis Fortification Archive illustrated on the dust jacket of Numerical Notation: A Comparative History *(Cambridge, 2009)*

"Ethnic Identity and Ethnic Labelling at Persepolis," by Wouter Henkelman and me, both in *Organisation des pouvoirs et contacts culturels dans les pays de l'empire achéménide*, edited by P. Briant and M. Chauveau (Paris, 2009).

In last year's *Annual Report*, I mentioned that I was particularly pleased to have found a document of a new type, an example of the surprises that the Persepolis Fortification Archive still has to offer. Now I can report with even more delight that we have found four other examples of the same type. What began as an extraordinary sidelight has become a repeating feature of the Persepolis Fortification Archive's structure and function. This is a well-known phenomenon in work on ancient Near Eastern texts and objects: finding one clear example of something newly understood brings other examples out of the shadows. It is a reminder that the Persepolis Fortification Archive Project is not only producing emergency records of basic information; it is also making strides in our ability to interpret the information.

Gratifying in another sense is the citation of the unique Old Persian Fortification text in Stephen Chrisomalis's *Numerical Notation: A Comparative History*. The expected audience for the Persepolis Fortification Archive, students of the Achaemenid Persian empire as a whole or in its parts, is scattered among academic subdisciplines, but this citation testifies to the value of the Persepolis Fortification Archive for an unanticipated audience and unexpected research, and it vindicates the use of electronic techniques and media.

A sadder note in closing: July brought the startling news of the sudden death of John Melzian. John was an industrial designer by training and profession and key member of the InscriptiFact team by inclination and choice. He built and installed the Persepolis Fortification Archive Project's PTM domes, and he supported the work of the project with curiosity, perspicacity, realism, and grace.

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