

PERSEPOLIS FORTIFICATION ARCHIVE PROJECT

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As members of the PFA Project continue to labor in their several vineyards, recording, completing, correcting, editing, and presenting the contents of the Fortification tablets, the most dramatic strides have come in work on the seal impressions under the overall supervision of Mark B. Garrison (Trinity University, San Antonio), and especially in work on thousands of sealed, unscribed tablets under the eyes and hands of Emma Petersen.

After graduating from the University of Minnesota in spring 2018 (with a BA paper on seals on the unscribed Fortification tablets, mentioned in last year's *Annual Report*) and before entering a PhD program in Iranian Studies at UCLA in autumn 2019, Petersen has worked almost nonstop on this enigmatic component of the PFA (fig. 1). By the end of June, about 65–70 percent of the tractable tablets were recorded; more than 2,100 items were fully processed by the end of the August. Those bland words, “processed” and “recorded,” refer to these tasks: Petersen (assisted since May by OI volunteers Lauren Friesen, Roberta Buchanan, John Buchanan, and Dee Spiech) prepares a paper fiche with a 1:1 outline drawing of each of the six surfaces of the tablet (fig. 2); she indicates the orientation of seal impressions on all sealed surfaces; she identifies impressions of previously known seals; and she identifies impressions of new seals, assigns an identifying number to each, and makes a drawing of each. Handling about 900 tablets in this way, Petersen found almost 3,000 new impressions of more than 1,000 previously recorded seals and almost 1,000 impressions of almost 500 newly identified seals, for a running total of almost 1,500 legible seals impressed on the unscribed tablets (fig. 3).



TOP: Figure 1. Emma Petersen draws the impression of a new seal on an unscribed Fortification tablet. BOTTOM: Figure 2. Volunteers Roberta and John Buchanan prepare a paper fiche to record the seals on an unscribed Fortification tablet.

PFUTS 430

PFUT 110-201 OBY
PFUT 485-205 REV
PFUT 905-201

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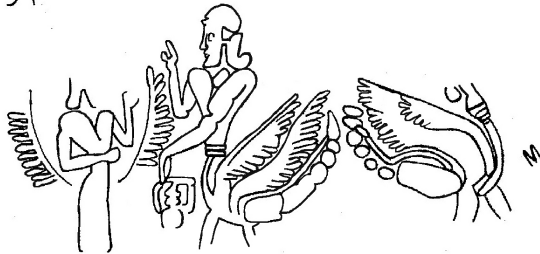


editd-EP 7/25/2015

PFUTS 798

PFUT 867-203 (=0011), UE

Figure 3. Examples of Petersen's records of exceptional seals on unscribed tablets. Mark Garrison comments, "The garland running across the top of the design and the small figural frieze at the bottom [of PFUTS 430] are unparalleled anywhere in the first millennium. . . . The style [of PFUTS 798], . . . over 100 seals rendered in this style [have] obvious links to Assyria and Elam, but I think that most of them are local (in some cases pre-dating the PFA by a generation or two) . . . [PFUTS 1480] seems similar to a few others . . . seals that appear to be experiments leading up to the Court Style [of Persepolis glyptic]."

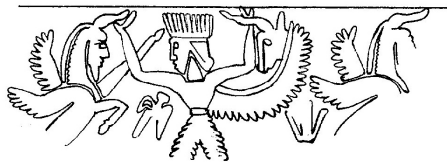


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EP 8 JUNE '19

Plainly, this careful work is producing a large increase in the already enormous body of ancient imagery, style, and skill that the Persepolis seal impressions represent. Less obviously, it also produces new information on the patterns of seal use on the uninscribed tablets and their connections with the patterns of seal use on the tablets with Aramaic and Elamite texts.

Those emerging connections allow Garrison and his collaborators to approach one of the biggest standing problems of the PFA, namely, how the Elamite documents, the Aramaic documents, and the uninscribed documents were functionally related. It is now certain that patterns of seal use originally identified in the Elamite documents also occur on the Aramaic and uninscribed documents, meaning that the functional and administrative relationships among the actors who applied the seals are similar in all three categories. About 10 percent of the seals on the uninscribed documents and about 11 percent of the seals on Aramaic documents also appear on Elamite documents, suggesting that the Aramaic and uninscribed documents have similar general administrative relationships with the Elamite documents. The patterned use of a few of the seals most frequently seen on more than one kind of tablet implies that many of the Aramaic and uninscribed tablets document outlays of travel rations—that is, that they are functional counterparts of the largest category of preserved Elamite texts. More detail, more connections, more clarity, and even more clues to problems in the Aramaic and Elamite texts can be expected from such combined analysis of the seals.

After such long immersion, says Petersen, the way in which she sees the seals has evolved. She now looks past the overall layout of the images to recognize the details that distinguish generally similar scenes from each other—the space between the limbs and bodies of figures, the shape of individual feathers on wings, the angle between a head and neck. This must be how ancient users of these tablets saw the seal impressions, just as we now sometimes distinguish among generally similar signatures by recognizing small variations in shape, slope, or separation of their elements. For an ancient user of these tablets, discriminating among the impressions of hundreds or thousands of seals was no more or less difficult than for a modern user of paper documents to discriminate among unfamiliar handwritten signatures.

Another veteran of the Persepolis seals, Erin Daly (now a doctoral student at the University of Iowa), returned in the summers of 2018 and 2019 to complete her work on seals on the Aramaic documents, in collaboration with PFA Project editor Elspeth Dusingberre (University of Colorado). Daly made about forty new final drawings of seals on Aramaic and uninscribed tablets, along with draft catalog entries, and updated other drawings on the basis of newly recorded impressions. Final drawings of all circa 700 seals on Aramaic tablets will soon be done, to be inked by archaeological illustrator Tina Ross under Dusingberre's direction, and Dusingberre, Daly, and Garrison will turn to the final catalog entries for book-form publication. In a parallel effort, Christina Chandler continued to produce inked final drawings of inscribed seals (about 188 of them now, up from last year's estimate), along with catalog entries and full discussions, for her doctoral dissertation at Bryn Mawr.

In collaboration with Chandler, PFA Project editor Annalisa Azzoni (Vanderbilt University) has completed final readings of Aramaic legends in impressions of inscribed seals. Conferring weekly with Dusingberre, Azzoni continues to establish best readings of the often refractory texts on the monolingual Aramaic tablets, so far covering the almost 350 tablets and fragments newly identified since the PFA Project began and more than half of about 500 items first recorded by the late Raymond Bowman. Her final readings of about 65 Aramaic epigraphs on the published Elamite tablets have been uploaded to the Online Cultural and Historical Research Environment (OCHRE), and she is preparing revised readings of the epigraphs on more than 200 other Elamite tablets and fragments for upload and display.

PFA Project editor Wouter Henkelman (École Pratique des Hautes Études, Paris) finished recollating about 2,100 published Elamite Fortification texts and all but 20 of about 2,700 unpublished

texts first recorded by George Cameron, Richard Hallock, and Charles Jones. He began to organize them for publication, not according to formal categories, but according to reconstructed ancient files identified by administrative district, principal commodities, and dates. Taking time from other priorities, I could not resist the siren song of the still unread (and sometimes unreadable) Elamite tablets and fragments. I entered first readings of about 70 new items (bringing the running total of new Elamite texts recorded since the Project began over 1,700), and I corrected first-draft editions of about 100 others.

Veteran student worker Teagan Wolter (NELC) glossed, parsed, and linked about 90 new texts in OCHRE; she began to enter Henkelman’s editions of about 200 Elamite texts previously recorded by Hallock but incomplete in OCHRE; and she began to correct OCHRE entries of tablets being packed for return to Iran, checking that the texts were fully parsed and that the tablets and seals were correctly linked. Naomi Brandt, Eduardo Garcia-Molina (both CMES), and Yanxiao He (NELC) entered corrections arising from my re-readings of about 250 previously read Elamite texts. These numbers show progress in reducing the backlog of texts to be entered and edited, but they do not even hint

at the amount of attention and effort they must spend to enter and correct long documents on large tablets, often laid out in multi-column formats that must be represented accurately if the text is to be useful (fig. 4). Rhyne King (NELC) continued to edit and correct some of the lapses and inconsistencies in the OCHRE glossary of the Elamite texts, and he began work on a more user-friendly query system that will help him and other researchers to exploit this rich, complex, messy information.

Veteran Ami Huang (NELC) and new workers Naomi Harris and John Shannon (both CMES) made almost 3,000 conventional images of about 160 tablets and fragments and edited about a third of them for uploading and linking in OCHRE. Young Bok Kim and Theresa Tiliakos (both NELC) made dynamic Polynomial Texture Mapping (PTM) sets of more than 300 tablets and fragments and high-resolution scans of about 35 items with Aramaic inscriptions; both sets of images include supplementary images of previously recorded fragments. During the summer of 2018, Monica Phillips (NELC), Ashley Clark (History), Matthew Foster (unaffiliated), Oliver Nataranj (Williams College), and Clara Dandy (UC Laboratory School) continued to reduce the backlog of unprocessed PTM sets, but work tapered off in the autumn until Dandy returned to PFA Project work after a first year at Vassar. During the year, they processed almost 900 PTM sets recording about 160 tablets and fragments, but image capture is again outstripping image processing, so the backlog is rebuilding.

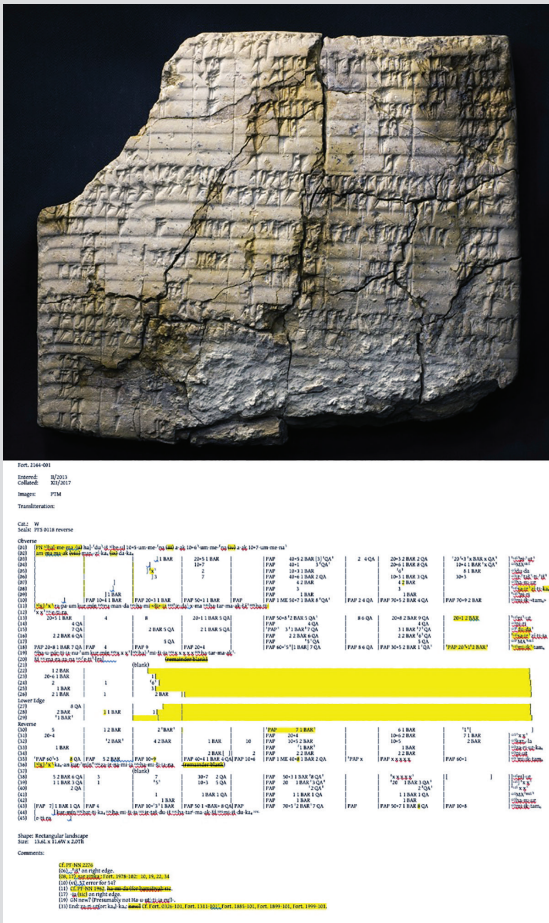


Figure 4. PTM image and draft edition, with corrections highlighted, of Fort. 2174-001, a ten-column balanced account of fruit revenues for three years.

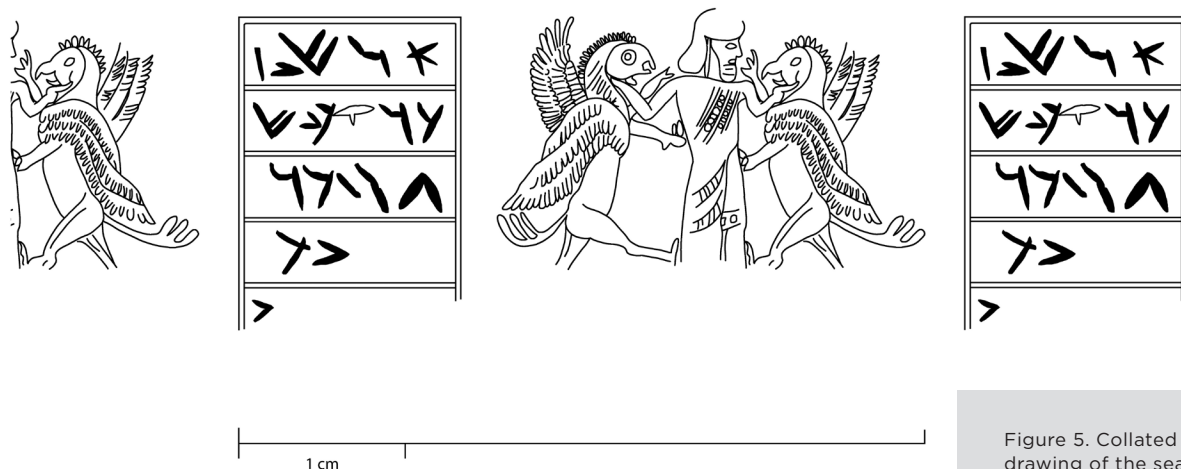


Figure 5. Collated drawing of the seal PFS 0913*, with Aramaic inscription that names the administrator called Iršena in Elamite, ʾršyn in Aramaic (Iranian *ršaina-) as “treasurer” (Aramaic *gnzbr*, Iranian *ganzabara-).

Standouts among sixteen public and academic presentations of PFA-related results were the joint presentation by Azzoni, Chandler, and Garrison on the seal PFS 0981* with an Aramaic inscription entitling its user “treasurer” (Aramaic *gnzbr*) at the annual ASOR meeting in Denver (fig. 5); Daly’s talk on seal process in the PFA at a conference on the image in the ancient Near East at the Institut national d’histoire de l’art, Paris; King’s papers on dependent labor at Persepolis at the annual meeting of the American Oriental Society in Chicago and on social and material inequalities in the PFA at a conference in Buenos Aires; Garrison’s talk at UCLA on the evidence of the Persepolis seals for deities and ritual at Persepolis; talks by Henkelman in Kiel and Amsterdam on land use and land tenure at Persepolis, and in Berlin and Tehran on Elamite-Iranian language contact and influence; and presentations by Miller Prosser (OCHRE Data Services) on digital text editing and philology at Lausanne and at the annual Recontre Assyriologique International in Paris.

Items recently published or forthcoming include articles by Azzoni, Chandler, Daly, and Garrison along with OI colleagues Jan Johnson and Brian Muhs on the Demotic Fortification tablets mentioned in previous *Annual Reports* (Azzoni et al. 2019); by Garrison on Persepolis glyptic in its wider context (Garrison 2018, forthcoming); by Henkelman on Achaemenid estates and on Bactrians (Henkelman 2018a, 2018b); by King on Achaemenid Arachosia (King 2019); by me on the chronology of the PFA and on numbered tablets in the Archive (Stolper forthcoming a, b); and a volume of essays by Garrison and Henkelman in the new publication of the Aramaic letters of the late fifth-century Egyptian satrap Arsames (Garrison and Henkelman forthcoming).

Such works add to the already large accumulation of prolegomena leading up to authoritative book-form publication of the PFA’s texts and seals, and they also illustrate the wider range of work on Achaemenid language, history, art, and religion that the PFA supports, now including work by a rising generation of scholars. The PFA Project’s records also sometimes support work in unexpected areas. We were reminded of this when a group led by Edward Williams, AI resident at a biotechnology firm in Los Angeles, drew on the PFA Project’s images of tablets with individual signs tagged and linked to their transliterated values as the basis for a new project to develop a machine vision and machine reading system (fig. 6). For those of us who work in fields that we see as important and consequential but others see as esoteric and remote, few things are more gratifying than such unforeseen audiences and applications.

After a long wait, the OI received an export license from the Office of Foreign Assets Control for the first batch of about 1,800 Fortification tablets to be sent to the National Museum of Iran. OI volunteers packed these tablets in shipping containers (as described elsewhere in this *Annual Report*). In October, OI director Christopher Woods, chief conservator Laura D'Alessandro, and I accompanied the shipment to Tehran, where the National Museum of Iran marked the event with an exhibition, displaying 110 representative Fortification tablets in the shadow of the monumental statue of Darius I (<http://irannationalmuseum.ir/fa/%d8%a8%d8%a7-%d8%ad%d8%b6%d9%88%d8%b1-%d9%88%d8%b2%db%8c%d8%b1-%d9%85%db%8c%d8%b1%d8%a7%d8%ab-%d9%81%d8%b1%d9%87%d9%86%da%af%db%8c%d8%8c-%da%af%d8%b1%d8%af%d8%b4%da%af%d8%b1%db%8c-%d9%88-%d8%b5%d9%86/>).

Even before completing the handover we began to prepare a second batch of about 3,500 items for packing. Reviewing our records of these tablets now consumes much of my time. New images are needed for some, editions of others have yet to be entered, descriptions of many need to be completed or made consistent, editions and glossary entries need to be corrected, and so on. Some clean-up of PFA Project records will be done as the tablets are packed, but much more will remain to be done after they are returned.

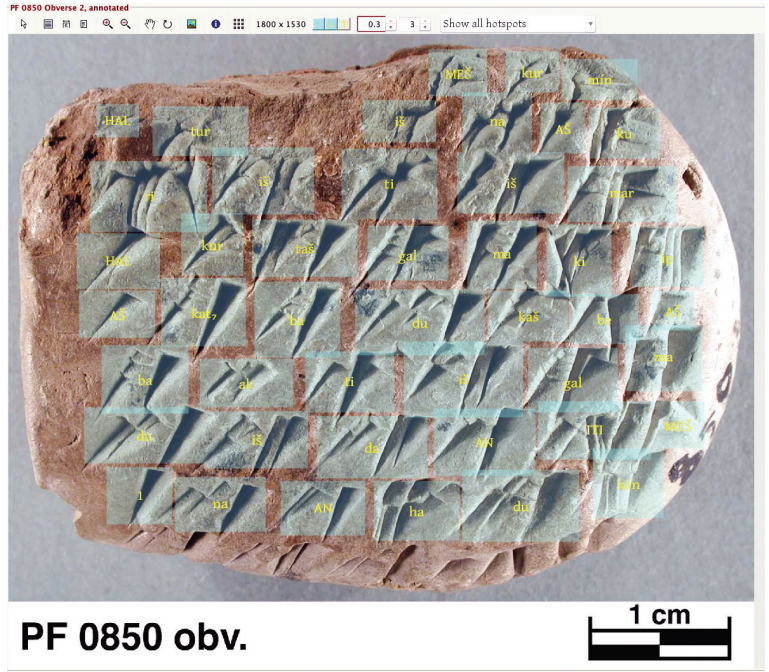


Figure 6. Hotspotted image of an Elamite Fortification tablet, with individual cuneiform signs tagged and linked to their transliterated values.

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