

# PERSEPOLIS FORTIFICATION ARCHIVE PROJECT

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Tucked away near the end of last year's Annual Report on the Persepolis Fortification Archive Project was the news that in October 2019 about 1,800 Persepolis Fortification tablets returned to the National Museum of Iran in Tehran. A press conference at the museum and a brochure accompanying an exhibition of representative tablets showcased some of the new knowledge about the Achaemenid Empire that has come from the OI's long custody of the tablets and from the work of the PFA Project in particular.

Immediately after completing this delivery, the OI applied to the US Office of Foreign Assets Control for another export license and began to prepare a second batch of about 3,500 more Fortification tablets for return. This effort continues in the face of the disruptions brought on by the pandemic. So do the various efforts of the PFA Project team. We beat on against limited access and straitened resources to build, investigate, and present a record of the archive, borne back ceaselessly into the past.

After almost fifteen years of labor, PFA Project editor Annalisa Azzoni (Vanderbilt University) has established readings of about 840 monolingual Aramaic tablets and fragments. She has begun to organize and interpret their terse contents with the help of the seal information compiled by project editors Elspeth Dusinberre (University of

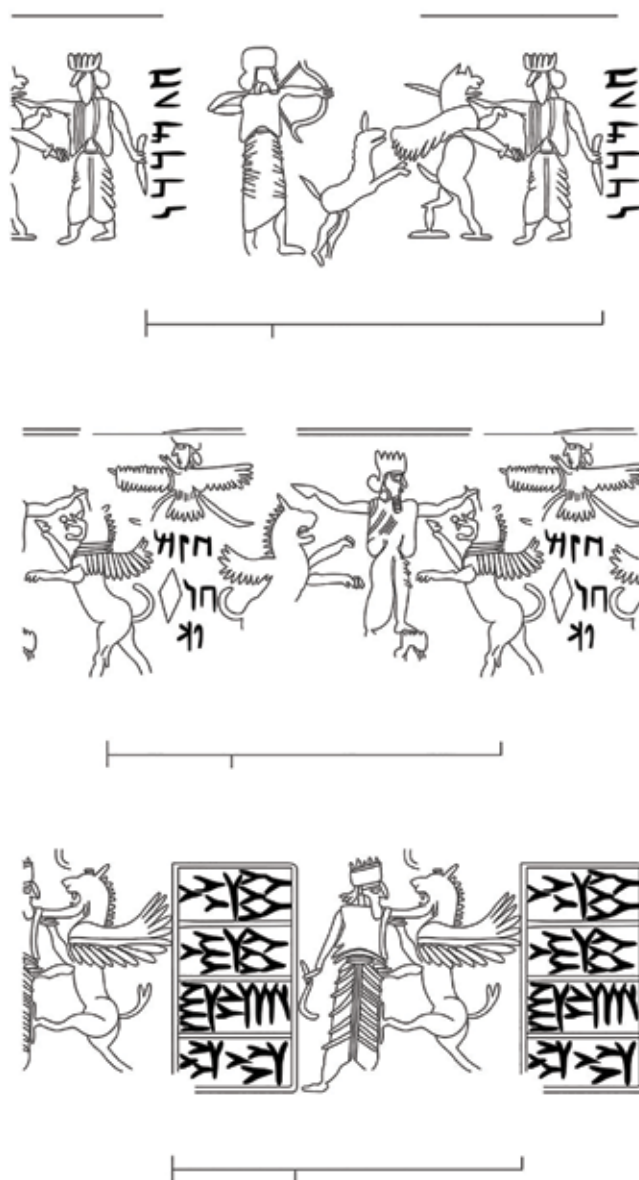


Figure 1. Christina's World: new collated drawings of seals with Aramaic and Elamite inscriptions, impressed on uninscribed tablets. From top: PFUTS 0114,\* PFUTS 0264,\* PFUTS 0787.\*

Colorado) and Mark Garrison (Trinity University, San Antonio) and reviewed by Erin Daly (University of Iowa). Daly finished drawings of the remaining 158 seals impressed on the monolingual Aramaic tablets. A catalogue of all 708 such seals is currently being edited for publication.

During four visits to Chicago before the lockdown in early March, Garrison reviewed the progress Emma Petersen (UCLA) made on the sealed, uninscribed tablets through the summer of 2019 (highlighted in last year's Annual Report). Petersen processed about 500 previously uncatalogued items. She identified 142 new seals and made many additions and corrections to drawings of previously recorded seals. Most of the circa 1,300 uninscribed tablets that remain to be studied have poorly preserved seal impressions, so the existing fiches recording almost 2,200 uninscribed tablets cover most of the legible seal imagery in this subcorpus. The overall tally of distinct and legible seals represented by impressions on all categories of PFA tablets (Elamite, Aramaic, uninscribed, miscellaneous) now stands at a stunning 4,059—one of the largest and best contextualized collections of imagery from anywhere in the ancient world.

Another veteran of PFA Project seal work, Christina Chandler (Bryn Mawr College), working with Azzoni and Garrison, has completed a catalogue of 175 inscribed PFA seals for the doctoral dissertation she hopes to defend in 2021. Inscribed seals were often used by individuals of high administrative or social rank, so her study will open a window on the imagery associated with the upper strata of Achaemenid Persian society (fig. 1).

Project editor Wouter Henkelman (École Pratique des Hautes Études, Paris) finished editing about 180 texts previously identified by Charles E. Jones, bringing the total of Elamite texts he has prepared for (re-)publication up to 5,034. Project director Stolper divided his effort among reviewing information on the tablets being packed for return to Iran, correcting his first readings of Elamite texts recorded since the beginning of the PFA Project, and adding readings of texts on more tablets and frag-

Figure 2. Harvesting the fragments: two examples of a newly identified category of documents, interim lists of fruit produced at various locales, prepared for tabulation in final accounts at Persepolis.



ments. He added 67 new Elamite texts, mostly longer journals and accounts (fig. 2), for a running total approaching 1,800 items.

Henkelman began to review Stolper's draft editions of these new Elamite texts during his research stay in Chicago in September–October 2019, paying heed to the counsel of one of the pioneers of work on the Persepolis Elamite texts, George Cameron, that “two minds are mutually invigorating and will usually secure an answer, if one can be found, to a problem that in itself and to one mind seems at times insolvable” (Cameron 1948: vii). Several hundred more unprocessed Elamite tablets and fragments have analytically meaningful text, and they may have fresh surprises. Still, it is likely that the edited sample, now exceeding 6,800 documents, is broadly representative of the relative weight of various text categories in the Elamite component of the PFA in a way that the original published sample was not. Then again, as Cameron might counsel, we could be wrong about that, and future generations of researchers may laugh at this estimate.

That those future generations will exist is no longer in doubt, thanks to the interest and research opportunities that the PFA Project has generated internationally. Two of Henkelman's students defended doctoral dissertations that rely on PFA evidence: Zohreh Zehbari of Tehran University (“A Study on the Specializations of the Non-Persian Artists in the Art of the Achaemenid Empire, Based on Archaeological and Written Evidence,” 2019) and Soheil Delshad of the Freie Universität Berlin (“Studies in Achaemenid Royal Inscriptions: Classifications, Royal Scribes, Literacy, and Audiences,” 2020), and other doctoral projects related to the PFA are under way.

Previous Annual Reports mentioned Stolper's article on chronological boundaries of the PFA, forthcoming in the *Festschrift* for Theo van den Hout. Henkelman's review of newly edited texts added another dimension to these results. It established that a few documents in the Persepolis Treasury Archive—hitherto considered to have nothing older than 492 BCE—were written in 507/506 or 506/505 BCE. This confirms what some project members had conjectured, that the Treasury Archive was partly contemporary with the PFA, not entirely consecutive to it. That puts the PFA and the institution that produced it in a significantly wider and deeper context of administration and information handling.

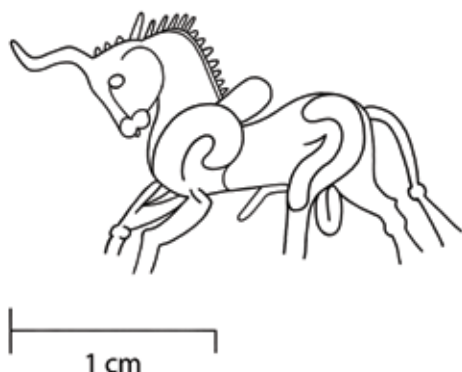
Regular readers of these reports have been able to observe the growth of ever-closer collaboration among PFA Project participants, going beyond ordinary co-authorship and sometimes shaping research agendas. The PFA itself necessitates such cooperation. The Elamite and Aramaic texts, the seals that accompany them, and the uninscribed, sealed tablets all belonged to a single system. As we have often said, understanding how these components functioned together is one of the biggest problems posed by the PFA. The ongoing work of the seal team has established that 10 percent of legible seals occurring on the Aramaic tablets and 10 percent of the legible seals occurring on the uninscribed tablets also occur on the Elamite tablets, implying that single seal users were involved in operations that were recorded in all of the three main media of the PFA.

The contribution by Garrison and Henkelman to the *Festschrift* for Margaret Root (Garrison and Henkelman 2020) comes to grips with this matter of individual and local information handling with a detailed study of four way-stations and granaries. With the help of Azzoni, they could show cogently that at one of these way-stations, a place called Pirdatkaš, *sealed* uninscribed tablets, *sealed* Aramaic tablets, and *unsealed* Elamite tablets were produced together—perhaps even literally tied together—to record issues of travel provisions (fig. 3a–d). This is surely not the whole story, but it is the first substantial advance in understanding connections and complementarity among the Persepolis media.

A skeleton crew of veteran PFA Project workers continues to enter, edit, and correct data in the Online Cultural and Historical Environment (OCHRE). When access to the OI building was cut off in March 2020, they adjusted their equipment, their homes, and their family lives to keep the work go-

## PROJECT REPORTS | PERSEPOLIS FORTIFICATION ARCHIVE PROJECT

a.



b.



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ing remotely. Teagan Wolter (NELC) uploaded about 100 new texts to OCHRE, glossing, parsing, and linking them to cross-references and images. Most of these were drawn from Henkelman's editions of large-format registers originally recorded by Richard T. Hallock. Wolter also corrected previously entered editions of about 75 other Elamite texts on the basis of Stolper's collations, and she began to revise, consolidate, and correct glossary entries.

Young Bok Kim (NELC) made Polynomial Texture Mapping (PTM) scans of about 110 tablets and high-resolution scans of 8 others before lack of funds and equipment problems suspended work in the project's High-Resolution Imaging Lab in late January. In February, Kim, Monica Phillips (NELC), and Ashley Clark (History) resumed post-processing of the PTM scans. Phillips is completing a detailed instruction manual that will allow future workers to learn the steps of this work and the ad hoc solutions that have emerged from experience. Kim and Clark processed scans of about 1,340 surfaces of about 220 tablets, cutting the backlog of unprocessed images from three years

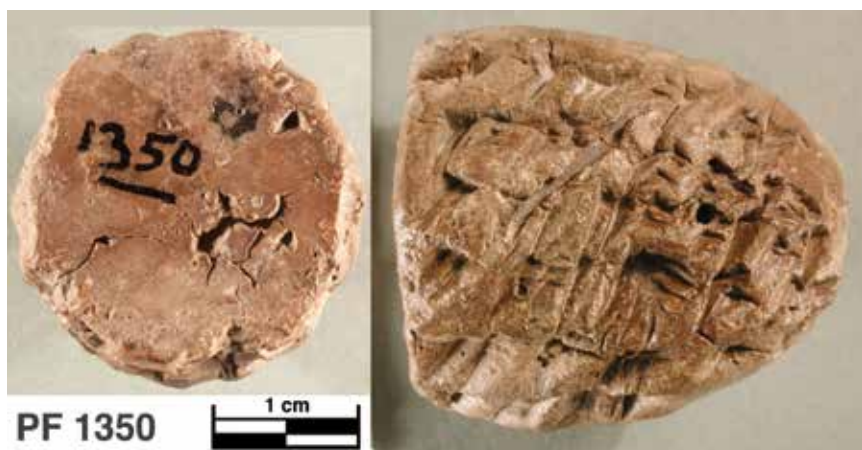
TOP TO BOTTOM (A-D): Figure 3. Sealing and not-sealing: PFS 0048 (a), used by the staff of a granary at the way-station Pirdatkaš, appears on almost 120 documents, including unscribed tablets (b), Aramaic tablets (c), recording an issue of travel rations, and Elamite tablets. Suppliers at Pirdatkaš also recorded outlays of travel rations in Elamite on unsealed tablets (d), perhaps meant to be tied to sealed, unscribed tablets.

c.



PFAT 0177

d.



PF 1350

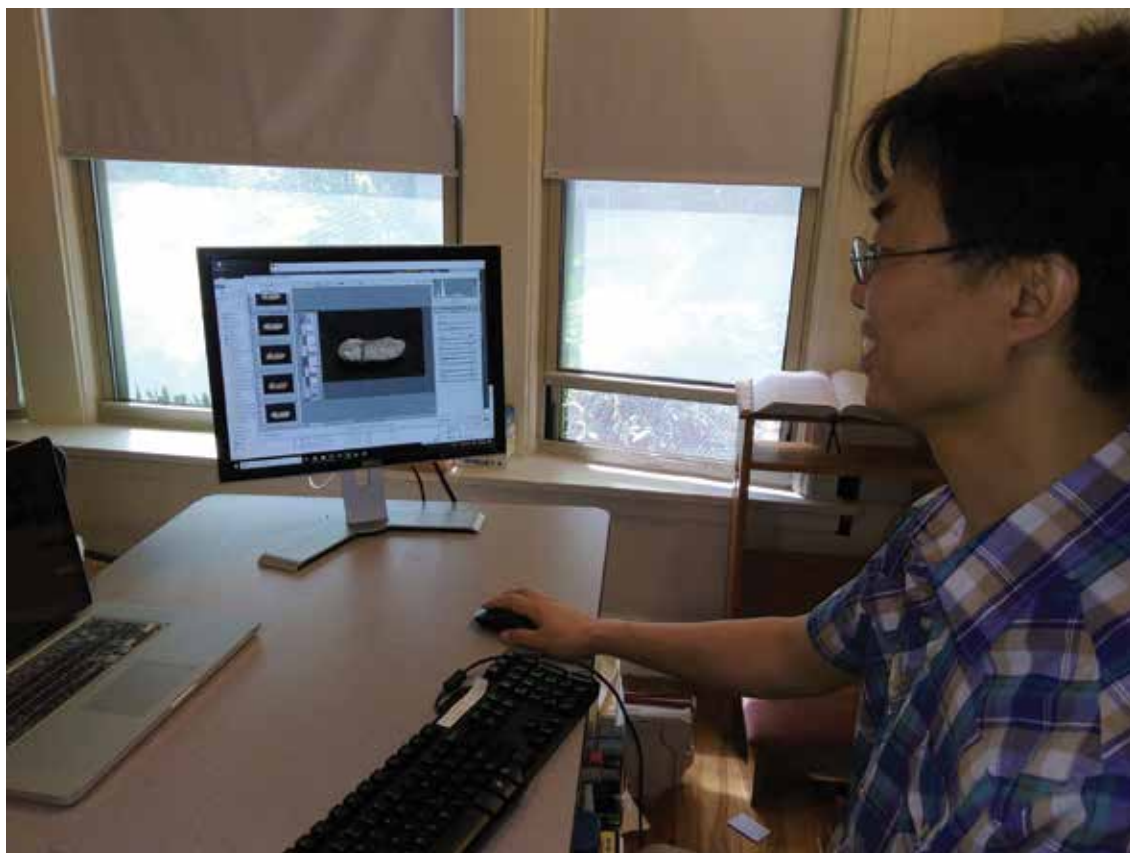


Figure 4. Working from home: Young Bok Kim processes PTM scans by day, uploads them by night.

to two (fig. 4). These numbers understate their efforts. Under ordinary circumstances, processed scans and their component images are uploaded to OCHRE overnight, in large batches. The glacial upload speeds and occasional service interruptions that are usual for home internet connections make this step of the process particularly vexing. Clark also had to contend with cramped workspace and the needs of an infant child, before moving away from Chicago and, alas, from the project in midsummer 2020.

New to the PFA Project this year is Peter Snell (CMES). After training with Ami Huang (the eighth to complete a PhD in NELC while working for the PFA Project), Snell dug into the backlog of unprocessed conventional digital images. He edited about 1,100 images of about 60 tablets. Undaunted by home internet limitations, he uploaded 930 images (representing about 50 tablets) to OCHRE.

All of this processing, correcting, uploading, and linking of images, texts, and seals moves slowly, and its repetitive steps may seem dull, but it assumes greater-than-ever importance now that we have to rely entirely on remote access to edit and publish the documents. A new OCHRE capability will help. OCHRE research data specialists Sandra Schoen and Miller Prosser developed a reconstruction tool for paleographic study of Hebrew manuscripts by the CEDAR project and then implemented it for the PFA Project. It allows comparison of damaged signs with complete signs from selected tablets to help interpret problematic traces (fig. 5).

The PFA Project's large library of tagged images that this new tool draws on was built up a few years ago by workers Dennis Campbell (PhD, NELC; now on the faculty of the University of California—San Francisco), Douglas Graebner (BA, College), and others. Our idea was that such images

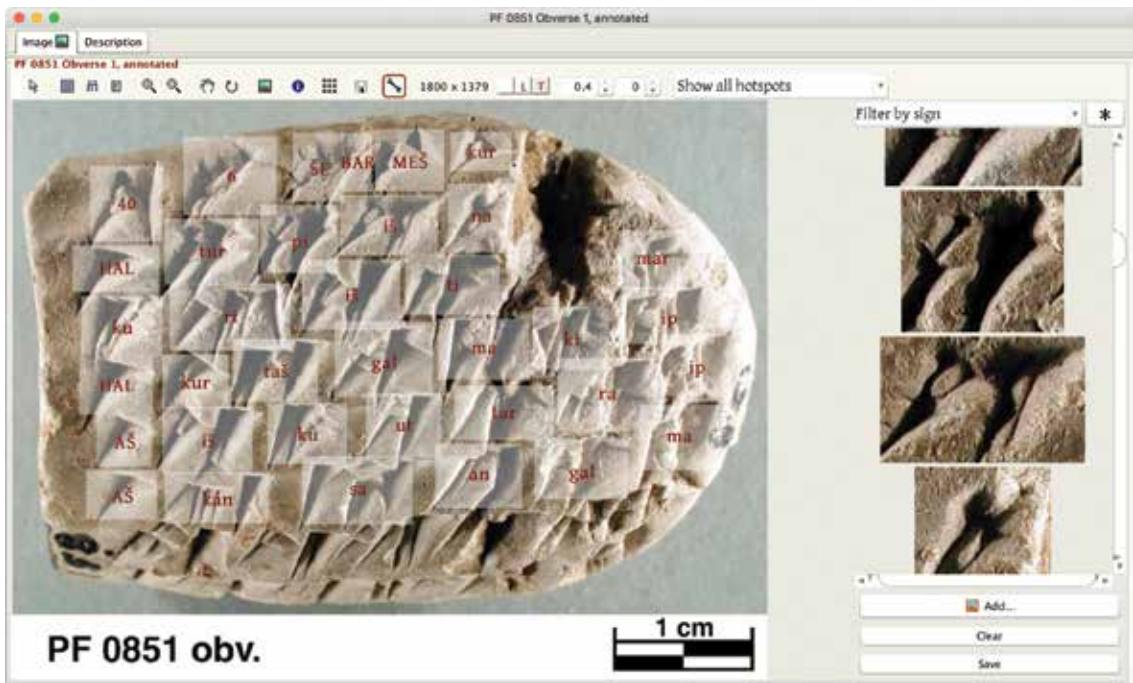


Figure 5. OCHRE reconstruction tool display of a tagged image with gallery of signs.

would allow viewers to see marks in the clay, transliteration, translation, glossary, and grammatical parse all together—not in the way we generally encounter them in classrooms, as distinct levels of abstraction, but as a continuum (fig. 6). We were thinking then of human users, but now these tagged images are also a training set for the machine-learning artificial-intelligence program of the DeepScribe Project described elsewhere in this Annual Report ([cdac.uchicago.edu/research/deciphering-cuneiform-with-artificial-intelligence/](https://cdac.uchicago.edu/research/deciphering-cuneiform-with-artificial-intelligence/)). That the machines are learning first from this script may amuse students of Babylonian and Assyrian cuneiform, to whom the signs of Achaemenid Elamite are apt to seem highly idiosyncratic, verging on unrecognizable.

Recent conference presentations and public lectures arising from PFA Project work include Azoni's paper on the Aramaic evidence on women at Persepolis, at the annual meeting of the Society for Biblical Literature in San Diego in November 2019; Garrison's lecture on the visual program of Darius I, at the Leiden Institute for Area Studies in October 2019; a joint presentation by Garrison and Petersen on representations of the divine and the numinous in Persepolis seal images, at the Fourteenth Melammu Conference in Los Angeles, in February 2020—and Henkelman's lectures at Harvard on Achaemenid imperial bureaucracy, administration, and institutional networks, in July 2019; at the University of Leiden on the status of contemporary Achaemenid studies in the light of the PFA results, in November 2019; at the Société Linguistique de Paris on the use of Elamite by Persians, in January 2020; at the Maison de l'Orient in Lyon on territorial organization in Achaemenid Persis, in February; and at the Sapienza Università, Rome, on Herodotus and the evidence of the PFA, in June. The Oriental Institute Post-Doctoral Fellow Conference in March 2020, organized by Delphine Poinot (an alumna of the PFA Project), included Garrison's in-person presentation on seals and document types in the PFA and Henkelman's remote presentation on the royal woman Irdabama and her seals. Henkelman continued his seminar at the École Pratique des Hautes Études, Paris, on the principal results of the first thirteen years of the PFA Project, from academic year 2018–19

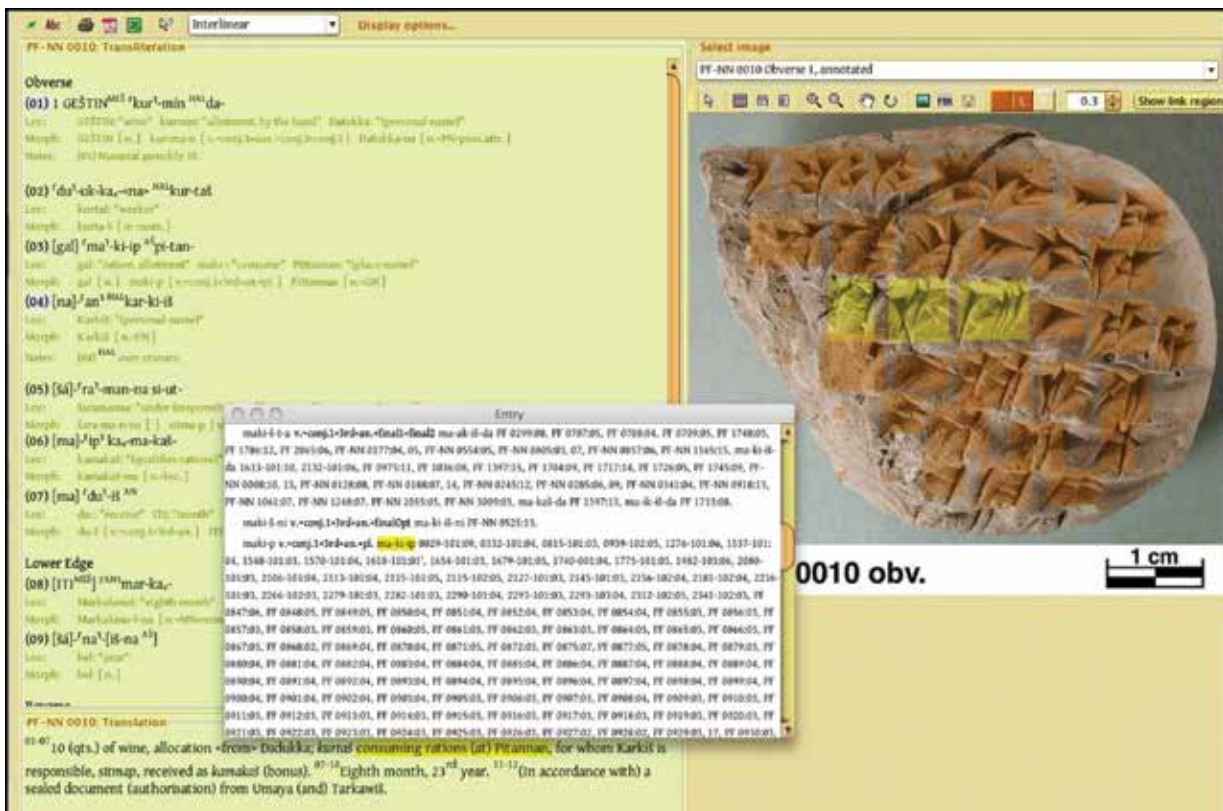


Figure 6. A continuum of views: the tablet, the signs, the lexicon, the grammatical analysis.

through academic year 2019–20, complemented with a reading course in Achaemenid Elamite using the project’s PTM images.

Outstanding among PFA-related publications, although not a product of the PFA Project itself, is the long-awaited *Festschrift* for Margaret Root edited by Dusingberre, Garrison, and Henkelman (Dusingberre et al. 2020). In addition to discussion and bibliography of Root’s own prolific contributions to the publication and study of PFA seals, its contents include many essays that draw on the evidence of the seals.

Another *Festschrift*, commemorating the Achaemenid project ([www.achemenet.com/en/](http://www.achemenet.com/en/)) and its creator Pierre Briant, co-edited by Stolper (Agut-Labordère et al., 2020), includes an article by Azzoni (2020) on a terse Aramaic text that borrows Iranian words to link fruit and a “tax agent”; an article by Garrison (2020) on an heirloom PFA seal; an article by D. T. Potts and Henkelman (2020) on the PFA evidence on hides and tanning; and an article by Henkelman and Stolper (2020) on arboriculture and fruit production around Persepolis, including full edition of the extraordinary tablet first announced in the *Oriental Institute 2015–2016 Annual Report* (p. 144, fig. 2). Henkelman immediately prepared a supplementary article (Forthcoming a), marshaling palynological evidence and philological analysis of many of the words for kinds of fruit in the Elamite texts (more than forty such words, so far). A third *Festschrift*, for Bruno Jacobs, co-edited by Garrison and Henkelman (with R. Rollinger and K. Ruffing), will have Garrison’s article on an unusual scene type, involving the winged symbol, in Persepolis glyptic (Forthcoming ), and Henkelman’s article (Forthcoming b) on references to boatmen in PFA texts.

Reflective readers will see the stream of commemorative volumes in the bibliographies of this and recent reports as the sign of a generational change in work on the PFA. A retrospective historical view locating the PFA and the PFA Project in the longer history of Oriental Institute research in and on Iran appeared in a volume commemorating the centennial of the OI (Alizadeh and Stolper 2019). A look forward, contemplating the future of PFA research in Iran, is in the exhibition brochure conceived and compiled by the PFA Project editorial team with Persian translations and able assistance from Henkelman's doctoral students at the Free University of Berlin, Soheil Delshad and Hamaseh Golestaneh (Nokandeh and Woods 2019).

## References

- Agut-Labordère, Damien, Rémy Boucharlat, Francis Joannès, Amélie Kuhrt, and Matthew W. Stolper, eds.  
2020 *Achemenet. Vingt ans après. Hommage à Pierre Briant*. Persika 21. Leuven: Peeters.
- Alizadeh, Abbas, and Matthew W. Stolper  
2019 "The Past and Present of the OI's Work in Iran." In *Discovering New Pasts: the OI at 100*, edited by Theo van den Hout, 274–303. Chicago: Oriental Institute.
- Azzoni, Annalisa  
2020 "PFAT 783: Fruit and the *bazikara*." In Agut-Labordère et al. (eds.) 2020, 10–15.
- Cameron, George G.  
1948 *Persepolis Treasury Tablets*. OIP 65. Chicago: University of Chicago Press.
- Dusinberre, Elspeth R. M., Mark B. Garrison, and Wouter F. M. Henkelman, eds.  
2020 *The Art of Empire in Achaemenid Persia: Studies in Honour of Margaret Cool Root*. Achaemenid History 16. Leiden and Leuven: Nederlands Instituut voor het Nabije Oosten and Peeters.
- Garrison, Mark B.  
2020 "An Heirloom Seal from Persepolis: Assyria, Elam, and Persepolis." In Agut-Labordère et al. (eds.) 2020, 151–76.
- Garrison, Mark B.  
Forthcoming "Some Observations on a Scene Type Involving the Winged Symbol in Persepolitan Glyptic." In *The Persian World and Beyond: Achaemenid and Arsacid Studies in Honour of Bruno Jacobs at the Occasion of his 65th Birthday, October 3rd, 2019*, edited by M. B. Garrison, W. F. M. Henkelman, R. Rollinger, and K. Ruffing. Münster: Zaphon.
- Garrison, Mark B., and Wouter F. M. Henkelman  
2020 "Sigillophobe Suppliers and Idiosyncratic Scribes: Local Information Handling in Achaemenid Pārsa." In Dusinberre et al. (eds.) 2020, 167–286.
- Henkelman, Wouter F. M.  
Forthcoming a "The Fruits of Paradise." In proceedings of the conference "Paleopersepolis," Kiel, 2019, edited by S. Balatti.
- Henkelman, Wouter F. M.  
Forthcoming b "'Boat People' and Imperial Strategies: A Reading of NN 2261." In *The Persian World and Beyond: Achaemenid and Arsacid Studies in Honour of Bruno Jacobs at the Occasion of His 65th Birthday, October 3rd, 2019*, edited by M. B. Garrison, W. F. M. Henkelman, R. Rollinger, and K. Ruffing. Münster: Zaphon.
- Henkelman, Wouter F. M., and Matthew W. Stolper  
2020 "Counting Trees around Persepolis." In Agut-Labordère et al. (eds.) 2020, pp. 177–207.



Nokandeh, Jebrael, and Christopher Woods, eds.

2019. *Persepolis, Chicago, Tehran: The World of the Persepolis Fortification Tablets*. PDF at [irannationalmuseum.ir/fa/product/%d8%ae%d8%aa-%d8%ac%d9%85%d8%b4%db%8c%d8%af%d8%8c-%d8%b4%db%8c%da%a9%d8%a7%da%af%d9%88%d8%8c-%d8%aa%d9%87%d8%b1%d8%a7%d9%86-%d8%ac%d9%87-d8%a7%d9%86-%da%af%d9%84-%d9%86%d8%a8%d8%b4%d8%aa%d9%87-%d9%87/](http://irannationalmuseum.ir/fa/product/%d8%ae%d8%aa-%d8%ac%d9%85%d8%b4%db%8c%d8%af%d8%8c-%d8%b4%db%8c%da%a9%d8%a7%da%af%d9%88%d8%8c-%d8%aa%d9%87%d8%b1%d8%a7%d9%86-%d8%ac%d9%87-d8%a7%d9%86-%da%af%d9%84-%d9%86%d8%a8%d8%b4%d8%aa%d9%87-%d9%87/).

Potts, D.T. and Wouter F. M. Henkelman

2020 “On Animal Hides and (Pre)-Tanning in the Persepolis Fortification Archive.” In Agut-Labordère et al. (eds.) 2020, 285–307.

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