Teaching Epigraphy in the Digital Age

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1 Introduction¹

Fields of knowledge are always in transition, with data continuing to accumulate and analyses of the data constantly nuancing previous understandings. No exception to this is the field of Northwest Semitic epigraphy. Northwest Semitic epigraphy is the broad study of ancient inscriptions written in the daughter languages of Proto-Northwest Semitic (e.g., Hebrew, Aramaic, Phoenician, Moabite, Ammonite, Edomite, and Ugaritic). It is concerned with linguistic, grammatical, syntactic, lexicographic, onomastic, historical, palaeographical, and/or genre studies.²

Within this article, we will delineate certain aspects of the history of this field and will discuss the traditional means of studying ancient texts in light of new technological innovations. Our primary goal is to demarcate how these innovations are impacting the ways we do research, as well as how they can facilitate the presentation of our research and the ways we teach students in our field. The focus of this article is linear alphabetic Northwest Semitic scripts; nonetheless, similar techniques and methodologies can be used for other epigraphic fields.

2 The Epigraphic Toolbox of the Past

2.1 *Handbooks and Compendia, Images and Drawings*

Various handbooks and compendia have been produced for the study of Northwest Semitic epigraphy from the time of the field's early days in the late nine-

- 1 This article is an extended version of a previous one, reused in this volume with the kind authorization of the publisher, the journal *Near Eastern Archeology* that we thank a lot: Parker, Heather D.D., and Christopher A. Rollston, "The Epigraphic Digital Lab: Teaching Epigraphy in the 21st Century CE", *Near Eastern Archaeology* 79, 2016, 44-56.
- 2 See Naveh, Joseph, *The Development of the Aramaic Script*, Jerusalem: Israel Academy of Sciences and Humanities, 1970; McLean, Mark D, *Palaeography*, In: *Anchor Bible Dictionary* 5, New York: Doubleday, 1992, 58-60.

teenth century CE until now. Among the most important early works are *CIS*,³ Lidzbarski's *Handbuch der nordsemitischen Epigraphik*⁴ and *Ephemeris für semitische Epigraphik*,⁵ and Cooke's *A Textbook of North-Semitic Inscriptions*,⁶ which were points of reference for at least a generation. During the middle of the twentieth century, Moscati's *L'epigrafia ebraica antica: 1935-1950*⁷ became a staple resource. Of course, Donner and Röllig's three-volume handbook entitled *KAI*⁸ has been the gold standard for five decades now, and Gibson's *Textbook of Syrian Semitic Inscriptions*⁹ has been considered very useful as well, though not as technical. More recently, Aḥituv authored a fine handbook of Northwest Semitic inscriptions entitled *Echoes from the Past: Hebrew and Cognate Inscriptions from the Biblical Period*.¹⁰ Other useful works include Aufrecht's *A Corpus of Ammonite Inscriptions*;¹¹ *Hebrew Inscriptions* by Dobbs-Allsopp, Roberts, Seow, and Whitaker;¹² and Gass's *Die Moabiter*.¹³

It is also important to note that palaeography has become an important subfield within the broader field of epigraphy.¹⁴ Palaeography can be described as the study of the morphology (shape) of the letters of a script, as well as the ductus of that script (i.e., the way in which letters are formed). Furthermore, palaeography focuses on the diachronic development of a script series

- 3 *Corpus inscriptionum semiticarum ab Academia inscriptionum et literarum humaniorum conditum atque digestum* (*CIS*), éd. Ernest, Renan, Paris: e Reipublicæ typographeo, 1881-1950.
- 4 Lidzbarski, Mark, *Handbuch der nordsemitischen Epigraphik*, Vols. I-II, Weimar: E. Felber, 1898.
- 5 Lidzbarski, Mark, *Ephemeris für semitische Epigraphik*, 3 vols, Giessen: Ricker, 1902-1915.
- 6 Cooke, George A, *A Textbook of North-Semitic Inscriptions: Moabite, Hebrew, Phoenician, Aramaic, Nabataean, Palmyrene, Jewish*, Oxford: Clarendon Press, 1903.
- 7 Moscati, Sabatino, *L'epigrafia ebraica antica: 1935-1950*, Rome: Pontifical Biblical Institute, 1951.
- 8 Donner, Herbert, and Wolfgang Röllig, *Kanaanäische und aramäische Inschriften* (*KAI*), 3 vols, Wiesbaden: Harrassowitz 1962-2002.
- 9 Gibson, John C. L, *Textbook of Syrian Semitic Inscriptions*, 3 vols, Oxford: Clarendon, 1975-1982.
- 10 Aḥituv, Shmuel, *Echoes from the Past: Hebrew and Cognate Inscriptions from the Biblical Period*, Jerusalem: Carta, 2008.
- 11 Aufrecht, Walter E., *A Corpus of Ammonite Inscriptions*, Ancient Near Eastern Texts and Studies 4, Lewiston, NY: Edwin Mellen Press, 1989.
- 12 Dobbs-Allsopp, Frederick W., Jimmy J.M. Roberts, Choon-Leong Seow, and Robert E. Whitaker, *Hebrew Inscriptions: Texts from the Biblical Period of the Monarchy with Concordance*, New Haven, CT: Yale University, 2005.
- 13 Gass, Erasmus, *Die Moabiter – Geschichte und Kultur eines ostjordanischen Volkes im 1. Jahrtausend v. Chr.*, Wiesbaden: Harrassowitz, 2009.
- 14 Rollston, Christopher A., "Scribal Education in Ancient Israel: The Old Hebrew Epigraphic Evidence", *Bulletin of the American Schools of Oriental Research* 344, 2006, 47-74.

(i.e., the way a script develops through time) and the synchronic variation of a script series (i.e., the variations in a script that are present during a particular chronological horizon).¹⁵ Among the most important palaeographic analyses of the twentieth century CE are Birnbaum's two-volume *The Hebrew Scripts*;¹⁶ Cross's palaeographic analyses of the Old Hebrew script in a trilogy of *BASOR* articles;¹⁷ McCarter's *The Antiquity of the Greek Alphabet and the Early Phoenician Scripts*;¹⁸ Naveh's *The Development of the Aramaic Script*¹⁹ and *Early History of the Alphabet*;²⁰ and Peckham's *The Development of the Late Phoenician Scripts*.²¹ Parker recently completed a study of the early development of the Phoenician, Hebrew, and Aramaic scripts, *The Levant Comes of Age: The Ninth Century BCE through Script Traditions*.²² Rollston has worked and published extensively on the palaeography of Northwest Semitic scripts. His studies include "The Script of Hebrew Ostraca of the Iron Age"²³ and *Writing and Literacy in the World of Ancient Israel*,²⁴ as well as various articles.²⁵

- 15 Peckham, J. Brian, *The Development of the Late Phoenician Scripts*, Cambridge, MA: Harvard University, 1968; Naveh, Joseph, *Early History of the Alphabet*, Jerusalem: Hebrew Universit Magnes Press, reprint of second revised ed., 1997, 58-60.
- 16 Birnbaum, Salomo A., *The Hebrew Scripts Part 1: The Text*, Leiden: Brill, 1971.
- 17 Cross, Frank M. Jr, "Epigraphic Notes on Hebrew Documents of the Eighth-Sixth Centuries, BC, I: A New Reading of a Place Name in the Samaria Ostraca", *Bulletin of the American Schools of Oriental Research* 163, 1961, 12-14, reprinted in: Cross 2003, 114-115; ———, "Epigraphic Notes on Hebrew Documents of the Eighth-Sixth Centuries BC, II: The Murabba'at Papyrus and the Letter Found near Yabneh-Yam", *Bulletin of the American Schools of Oriental Research* 165, 1961, 1962a, 34-46, reprinted in: Cross 2003, 116-124; ———, "Epigraphic Notes on Hebrew Documents of the Eighth-Sixth Centuries BC, III: The Inscribed Jar Handles from Gibeon", *Bulletin of the American Schools of Oriental Research* 168, 1961, 1962b, 18-23, reprinted in: Cross 2003, 125-128; ———, *Leaves from an Epigrapher's Notebook: Collected Papers in Hebrew and West Semitic Palaeography and Epigraphy*, Harvard Semitic Studies 51, 1961, Winona Lake, Eisenbrauns, 2003.
- 18 McCarter, P. Kyle. Jr, *The Antiquity of the Greek Alphabet and the Early Phoenician Scripts*, Missoula, MT.: Scholars Press, 1975.
- 19 Naveh, *The Development*.
- 20 Naveh, *Early History*.
- 21 Peckham, J. Brian, *The Development of the Late Phoenician Scripts*, Cambridge, MA: Harvard University, 1968.
- 22 Parker, Heather D.D., "The Levant Comes of Age: The Ninth Century BCE through Script Traditions", PhD diss., Johns Hopkins University, 2013.
- 23 Rollston, Christopher A., "The Script of Hebrew Ostraca of the Iron Age: 8th-6th Centuries BCE." PhD diss., Johns Hopkins University, 1999.
- 24 Rollston, Christopher A., *Writing and Literacy in the World of Ancient Israel: Epigraphic Evidence from the Iron Age*. Atlanta: Society of Biblical Literature, 2010.
- 25 Rollston, Christopher A., "Non-Provenanced Epigraphs I: Pillaged Antiquities, Northwest Semitic Forgeries, and Protocols for Laboratory Tests", *MAARAV* 10, 2003, 135-193; ———, "Scribal Education in Ancient Israel: The Old Hebrew Epigraphic Evidence", *BASOR* 344, 2006, 47-74; Rollston, Christopher A., "Prolegomenon to the Study of Northwest Semitic

FIGURE 9.1
Samaria ostracon 16A
(collection of the Istanbul
Archaeology Museums)
Note: The complete list of
figures with the copyright
information can be found
on pages X-XII

Many of these resources have made superb contributions to the field. Still, many of them have not been without their limitations. Typically, they have included transliterations and translations of individual inscriptions but have often not included images of these texts. Furthermore, even if a photograph of an inscription has been included in a publication, it has often not been of a quality that would permit further independent analysis of that inscription by other scholars. Publications rarely include multiple images of an inscription that focus on areas that are difficult to read or that show the inscription in various light spectra or illuminated from various directions, images that might reveal important textual data.

Producing a drawing or facsimile of an inscription has long been a fundamental aspect of epigraphy. A drawing depicts the physical aspects of a text and its script, including both the letters of an inscription and any damage or wear on the physical object on which the inscription appears. It can also serve as a graphic representation of a palaeographic analysis of the script of an inscription alongside a written description of that analysis.

Paleography and Epigraphy." In: *"An Eye for Form": Epigraphic Essays in Honor of Frank Moore Cross*, edited by Jo Ann Hackett and Walter E. Aufrecht, Winona Lake, *Eisenbrauns*, 2014a, 1-4; Rollston, Christopher A., "Northwest Semitic Cursive Scripts of Iron II." In: *"An Eye for Form": Epigraphic Essays in Honor of Frank Moore Cross*, edited by Jo Ann Hackett and Walter E. Aufrecht, Winona Lake, *Eisenbrauns*, 2014b, 202-234; For other palaeographic studies of note, see Attardo 1984; Haines 1966; Kaufman (1966) 1982; Lemaire 2006; Renz (1995) 1997; and Yardeni 1997.

FIGURE 9.2
Samaria ostrakon 16A
(collection of the Istanbul
Archaeology Museums);
copyrights on page VIII.

Drawings or facsimiles of texts have likewise not always been included in publications, and when they have, they also have been of varying quality. Some scholars have made drawings “freehand,” which is quite difficult to do with precision. Others have made drawings by placing a piece of Mylar paper on a photo of the inscription and then tracing it with pen and ink. This works tolerably well for inscriptions that are very clear, but not that well for inscriptions that have segments that are faded or abraded, as the Mylar further reduces the visibility of the text. Moreover, if scholars have not had quality images from which to work and/or have not personally seen and studied the inscriptions they are drawing, the accuracy of their drawings will be affected accordingly (Figs. 9.1-3).

Furthermore, the purpose of any drawing is to allow a particular scholar to represent his or her interpretation of an epigraph. Just as there can be differing interpretations of data in any field of study, various epigraphers might differ with regard to what they ‘see’ when they examine an inscription. For example, disagreement could occur regarding whether a particular spot on an ostrakon (i.e., a pottery sherd reused as a writing medium) is a trace of ink or letter remnant or simply part of the hue of the pottery; or, for an incised inscription, whether a “rouge” is a natural pit in the medium or is a portion of an inscribed letter. Thus, as drawings are perforce interpretive, they are, to some degree, subjective, and the quality of a drawing stands in direct correlation to the quality of the interpretive skills of the epigrapher who executed it. It is important

FIGURE 9.3
Samaria ostrakon 16A (collection
of the Istanbul Archaeology
Museums); copyrights on
page VIII.

to note here that the caliber of a drawing is more difficult to assess if no good images of the depicted inscription are readily available with which to compare it.

3 The Epigraphic Toolbox of the Twenty-First Century CE: Present Developments and Prospects for the Future

3.1 *Improvements in Imaging and Drawing, Technologies and Techniques*

During the past few decades, there have been a number of developments within the field of Northwest Semitic epigraphy, among the most important is the availability of high-quality photographic images as a resource for the study of inscriptions, as well as improvements in technologies that allow for manipulation of these images and for producing drawings.

As the need for more and better image resources for epigraphic study has become increasingly recognized, scholars have endeavored to meet that need and publications have begun to improve.²⁶ Of course, the quality and the avail-

26 See Arico, Ashley Fiutko, Nathaniel E. Greene, and Heather D.D. Parker, "Ancient Near Eastern Material Culture Studies and Reflectance Transformation Imaging (RTI)." In: *Proceedings of The Future of the Past: From Amphipolis to Mosul. New Approaches to Cultural Heritage Preservation in the Eastern Mediterranean. Conference at the Museum of Archaeology and Anthropology at the University of Pennsylvania*, Archaeological Institute of

ability of images are always subject to available technologies – these technologies impinge upon both imaging (data capture) and publication (data sharing). The advent of digital technologies has made easier and reduced dramatically the costs inherent in both procedures.

The use of digital images for epigraphic study has various benefits. For one, digital images can be manipulated with ease. Moreover, images produced with various photographic techniques, such as Multi-Spectral Imaging and Reflectance Transformation Imaging (RTI), that allow for enhanced capture of data – particularly data that cannot be seen with the naked eye – are also of great use. Multispectral Imaging, of use with texts written in ink or pigments, captures a sequence of images of an inscription in different wavelengths across the light spectrum, both visible and invisible, including ultraviolet and infrared. RTI, which is particularly helpful for viewing the textured surface of incised objects, captures a sequence of images of a text illuminated from various directions. A researcher may use the dynamic light source and special filters within RTI viewer software to reveal details of an inscription that are not visible in images wherein an object is lit only from a single direction.

America Site Preservation Program: Heritage, Conservation, and Archaeology. <<https://www.archaeological.org/news/sitepreservationhcaspecialpubs/21700>>, accessed on 10.04.19; Faigenbaum-Golovin, Shira, Christopher A. Rollston, Eli Piasetzky, Barak Sober, and Israel Finkelstein, "The Ophel (Jerusalem) Ostrakon in Light of New Multispectral Images", *Semitica* 57, 2015, 113-137; Garfinkel, Yosef, and Saar Ganor, Khirbet Qeiyafa, vol. 1: *Excavation Report 2007-2008*, Jerusalem: Israel Exploration Society and Hebrew University of Jerusalem, 2009; Greene, Nathaniel E., and Heather D.D. Parker, "Field of View: Northwest Semitic Palaeography and Reflectance Transformation Imaging (RTI)", In: *Epigraphy, Philology, and the Hebrew Bible*, edited by Jeremy M. Hutton and Aaron D. Rubin, Atlanta: Society of Biblical Literature, 2015, 209-235; Hanneken, Todd R., "New Technology for Imaging Unreadable Manuscripts and Other Artifacts: Integrated Spectral Reflectance Transformation Imaging (Spectral RTI)." In: Clivaz, Claire, Dilley, Paul, Hamidović, David, *Ancient Worlds in Digital Culture, Digital Biblical Studies (DBS 1)*, Leiden / Boston, Brill, 2016, 180-195. Lemaire, André, and Benjamin Sass, "The Mortuary Stele with Sam'alian Inscription from Ördekburnu near Zincirli." *Bulletin of the American Schools of Oriental Research* 369, 2013, 57-136; see Lundberg, Marilyn., J. "New Technologies: Reading Ancient Inscriptions in Virtual Light." <<http://www.inscriptifact.com/news/article.html>>, accessed on 10.04.19; Parker, Heather D.D., and Arico, Ashley Fiutko, "A Moabite-Inscribed Statue Fragment from Kerak: Egyptian Parallels", *Bulletin of the American Schools of Oriental Research* 373, 2015, 105-120; See R.B. Toth Associates, <<http://www.rbtoth.com/spectral-imaging-partners.html>>, accessed on 10.04.19; Sober, Barak, Shira Faigenbaum, Itzhaq Beit-Arie, Israel Finkelstein, Murray Moinester, Eli Piasetzky, and Arie Shaus, "Multispectral Imaging as a Tool for Enhancing the Reading of Ostraca." In: *Palestine Exploration Quarterly* 146, 2014, 185-197; see Tappy, Ronald E., and P. Kyle McCarter Jr., eds. 2008, *Literate Culture and Tenth-Century Canaan: The Tel Zayit Abecedary in Context*. Winona Lake, *Eisenbraun West Semitic Research Project (WSRP)*, <<https://www.eisenbrauns.org/books/titles/978-1-57506-150-4.html>>, accessed on 10.04.19.

FIGURE 9.4 Adobe Photoshop's Invert tool being used on image of Samaria ostracon 28 (collection of the Istanbul Archaeology Museums); copyrights on page viii.

FIGURE 9.5 Adobe Photoshop's Invert tool being used on an image of Samaria ostracon 28 (collection of the Istanbul Archaeology Museums); copyrights on page ix.

Just as technology has provided scholars with more precise images of inscriptions, it has also provided them with more options, and arguably more efficient ones, for using these images in order to obtain as much data from them as possible. One of the most commonly used software programs for working with digital images is Adobe Photoshop.²⁷

27 See Adobe Photoshop, <<http://www.photoshop.com/products/photoshop>>, accessed on 10.04.19.

FIGURE 9.6 Adobe Photoshop's Curves tool being used on an image of Samaria ostrakon 28 (collection of the Istanbul Archaeology Museums); copyrights on page ix.

The Photoshop “invert” tool (Figs. 9.4-5) or the “curves” tool (Figs. 9.6-7), which can lighten or darken an image, can maximize the legibility of writing on inscriptions. Images of seals can be flipped to facilitate epigraphic study. For the purposes of script analysis, it is often very useful to be able to measure the angles of certain letter strokes and to analyze the synchronic variation and diachronic development of stroke angles. Photoshop has tools that can be easily used to measure these developments (Fig. 9.8).

Just as Photoshop is a preferable program for the initial manipulation of digital images, Adobe Illustrator²⁸ is a preferable program for the production of digital drawings. While both Photoshop and Illustrator offer essentially the same basic digital drawing tools, such as brushes and pens, Illustrator, as a vector graphics creation application, facilitates the production of more precise and accurate drawings, and offers a higher degree of editing capabilities and limitless output resolution, than does a raster graphics program like Photoshop. Fortunately, both programs are designed to work interchangeably as part of the Adobe Creative Suite.²⁹ Though, as mentioned previously, drawings are not without their limitations, with the availability of good images (especially coupled with on-site study of an inscription itself) and the practice of sound

28 See Adobe Illustrator, <<http://www.adobe.com/products/illustrator.html>>, accessed on 10.04.19.

29 See Adobe Creative Suite, <<http://www.adobe.com/products/catalog.html>>, accessed on 10.04.19.

FIGURE 9.7 Adobe Photoshop's Curves tool being used on an image of Samaria ostracon 28 (collection of the Istanbul Archaeology Museums); copyrights on page IX.

FIGURE 9.8 Adobe Photoshop's measurement tools being used on an image of the Kerak fragment (Kerak Museum, No. 6807); copyrights on page IX.

epigraphic method,³⁰ there can be a substantial amount of objectivity and accuracy involved in the drawing process.

30 Parker, Heather D.D., "The Levant Comes of Age", Fig. 1, 9-44; Rollston, "Non-Provenanced", 150-157; Rollston, "Scribal Education", 50-54; Rollston, "Prolegomenon", 1-4; Rollston, "Northwest Semitic Cursive Scripts", 202-204.

FIGURE 9.9 Adobe Illustrator's Pen tool being used on an image of the Amman Citadel inscription (Jordan Archaeological Museum, No. J 9000); copyrights on page 1x.

Digital drawings are normally produced in the following manner. High resolution digital images are placed in the base layer of an Adobe Illustrator file, and digital drawing tools are then used to trace the digital image with utmost precision onto a second layer in the file. The main Illustrator drawing and editing devices are the pen and paintbrush tool. By using these tools one can draw lines and create curves that define a shape, such as the outline of a letter. The shape of the tip of these tools can be formatted to match the shape of the incisions or strokes found on a particular inscription. That is, the digital tool can be adjusted to emulate the particular type of material tool that was used to make the inscription, as well as the weight of the strokes that form the individual letters (Fig. 9.9). Additional features such as the blob brush and live trace tools, allow for the rapid “roughing out” of letter outlines.

Digital drawing obviously allows for initial drawing speed and a high degree of precision in the finished product, but it is most strikingly different from drawing with pen and ink in its ability to permit an epigrapher to manipulate the drawing once made. First and most practically, it allows for easy correction and erasure while executing a drawing. Furthermore, it makes the epigraphic data in a drawing both easily comparable and easily transferable. This aids in both script analysis and in the publication and presentation of such analysis. The most obvious way is in the preparation of palaeographic script charts, which will be discussed in more detail shortly.

The drawing tools in Illustrator can be controlled through various means. The most basic is with the use of a standard computer mouse. However, we

FIGURE 9.10 Producing a digital drawing of KTU 1.46 with a tablet and stylus connected to a desktop computer; copyrights on page ix.

have found that using additional hardware, such as a tablet with a stylus, like those made by Wacom, affords an epigrapher greater control and, thus, facilitates more accurate drawing (Fig. 9.10). Using handheld tablets and Ultrabooks that allow one to draw with a stylus directly onto the screen, and thus directly onto the image of an inscription itself, is also advantageous. Drawing in this way is quite user-friendly and replicates as closely as possible the actual actions of a scribe. Furthermore, small, easily portable tools such as these provide particular convenience when working in inscription collections, as they allow for both the execution and correction of drawings on site. Certainly, there are a variety of tablets available.³¹ Based on experience, we currently prefer to use the Microsoft Office Surface Pro. The Surface Pro is quite versatile and easily transitions between a standard word processor and a 'tablet', which makes it excellent for use in the field (Figs. 9.11-12). Most importantly, it is one of the few 'tablet-like' devices that is able to run the full versions of both Adobe Photoshop and Illustrator.

31 Holmstedt, Robert D., "Reading through the Noise: KA1 30 with Fresh Eyes (and Better Photos)", Paper presented at the annual meeting for the Society of Biblical Literature, Chicago, IL, November 21, 2012.

FIGURE 9.11
Producing a digital
drawing of the Kerak
fragment (Kerak
Museum, No. 6807)
on a handheld tablet
with stylus;
copyrights on page IX.

FIGURE 9.12
Producing a digital
drawing of the Kerak
fragment (Kerak
Museum, No. 6807)
on a handheld tablet
with stylus;
copyrights on page IX.

4 Teaching Epigraphy in the Twenty-First Century CE: Method and Tools

Because of the photographic and digital resources available, Northwest Semitic epigraphy can now be taught in a very refined and sophisticated manner. The “epigraphic digital lab” is a core component of this pedagogy. Having both inaugurated and conducted such a lab, in what follows we would like to highlight some of its constituent parts and to offer at least one model for replication.

A typical epigraphy class can be divided into two parts. In part one, students will be taught the methods and considerations necessary for making an epigraphic study of an inscription. Normally, this is the place to discuss things such as proposed readings, comparative Semitic philology, linguistic isoglosses, phonology, orthography, and palaeography. In part two, students will learn techniques for presenting such epigraphic analyses, particularly palaeographic analyses. They will learn the methods for making digital drawings and script charts. There will of necessity be overlap between the things taught in each part of the course; however, we have divided it into two sections for pedagogical purposes. Each member of the class will need their own computer, equipped with digital drawing software and with hardware that allows the user to manipulate the pen tool, such as a mouse or tablet and stylus.

4.1 *Part One: Epigraphic Analysis*

Typically, the handbooks and other resources previously mentioned have also been the standard references for epigraphy courses. Thus, students are often first introduced to the corpus of *Northwest Semitic Inscriptions* in transliteration. Transliterations that are, at times, accompanied by drawings and, less often, by images. Though studying inscriptions in transliteration alone is certainly serviceable, it is hardly ideal.

Without the presence of a high-quality image, students are unable to assess for themselves whether or not the transliteration, and drawing if present, offer the best possible interpretation of the inscription. Just as it was mentioned previously that drawings represent the interpretation of the text that is actually present in an inscription and are, therefore, somewhat subjective, transliterations are also interpretations. This is particularly important for a student to bear in mind when studying inscriptions that are particularly faded or damaged, and this is something that he or she will be less aware of without seeing an actual image of the text. A student should be presented and allowed to struggle with the complexities of actually performing a full epigraphic analysis. Now, because of the increasing availability of high-resolution images, it

is possible to teach epigraphy in a more informative and instructive way, and instructors have begun to incorporate the use of images into their classes.

During class images of an inscription will be projected onto a screen and displayed on the monitor of each student. First, in order to establish a firm reading of the text, students will be instructed to read the letters of the inscription directly from the screen without notes. This approach is valuable and superior to reading inscriptions in transliteration alone. Students will become very familiar with the actual script tradition in which the text is written and also begin to understand the interpretive nature of reading an inscription, as they learn from experience the reasons that varying readings of a letter might occur – such as graphemic similarity between letters, idiosyncratic letter forms, or damage that has occurred to an inscription. After having established a secure reading of the text, students will then begin to work through the inscription line by line, offering a translation and discussing various lexical, syntactical, and comparative Semitic issues.

Also during part one of the class, the instructor will begin to discuss various palaeographic facets of the script of the inscription as well as the methodological principles being followed when conducting a palaeographic study. There are a variety of things that students will need to keep in mind when analyzing (and eventually drawing) inscriptions, as these data will provide important, diagnostic information for script analysis.³² Students should consider the following with regard to the morphology of letter forms (Fig. 9.13):

- The placement of a letter in relation to the scribal guide line.
- The shape or form of a letter.
- The size of letters in relation to each other.
- Letter environment: the position of letters in relation to each other.³³
- The stance of letters in relation to the vertical.
- Scribal ductus – the way in which a scribe executed a letter form, including the number of
- strokes with which he made it, the order in which he produced these strokes, and the
- direction in which he moved the writing instrument as he made them.
- Scribal media, whether stone, papyrus, velum or leather; chisel or ink with brush or pen.

32 Parker, Heather D. D, "The Levant comes", Fig. 1, 9-44; Rollston, "Non-Provenanced", 150-157; Rollston, "Prolegomenon", 1-4.

33 Zuckerman, Bruce, with Lynn Swartz Dodd, "Pots and Alphabets: Refractions of Reflections on Typological Method." *MAARAV* 10, 2003, 89-133; Rollston, "Non-Provenanced", 160-162; Rollston, "Scribal Education", 58-59.

FIGURE 9.13 Principles of letter morphology related to the study of Northwest Semitic epigraphy and palaeography (linear alphabetic scripts); copyrights on page 1x.

– he particular expression of a script that a scribe chose to use – whether formal or cursive.

4.2 *Part Two: Presentation of Epigraphic Analysis*

During the second part of class, the instructor will give assignments aimed at teaching the specific skills necessary for presenting an epigraphic analysis, such as the manipulation of digital images and the production of digital drawings and script charts. While drawing (and making decisions about how and what to draw), many methodological principles taught in the first part of the class will be exemplified and reinforced.

Students will first need to learn basic skills for using digital imaging and drawing software. Fortunately, both Adobe Photoshop and Illustrator come equipped with their own help documentation and/or video tutorials. The course instructor might also offer some basic lessons.

A most useful resource for many scholars and students at academic institutions are teaching and learning centers. For example, one component of Johns Hopkins University Sheridan Libraries is the Center for Educational

Resources.³⁴ This center partners with faculty and graduate students to connect innovative teaching strategies with instructional technologies. Some centers or department divisions will often readily provide basic instruction and introductory workshops in digital imaging and drawing software. In the early sessions of a course, an “expert” in such software could teach basic skills. After this initial instruction, the regular course instructor can then tailor future training and assignments to the way in which these programs can be used specifically in the field of epigraphy.

4.3 *Digital Drawings*

Students should first learn to make a complete drawing of an inscription. They should choose a base image of the text from which to execute their drawing. If multiple images of the inscription are available, especially images wherein the text has been photographed in a variety of light spectra and/or lit from a variety of directions, then students should be instructed to also consult these images for any additional data they might reveal.

As students begin the drawing process, various questions will arise naturally. Such as, “What constitutes important palaeographic information?” That is, “What should be included in a palaeographic drawing?” These questions develop as students encounter things like pockmarks, shadows, and abrasions on the surface of an inscribed object, and/or attempt to assess the “true” outline of a letter’s form versus the wear or damage that might have occurred around the edges of that form. While most information or data found within an inscription or the image of an inscription is important, it is not all diagnostic. Students should be reminded of the purpose of a drawing, namely that it is not intended to be a snapshot of an inscription but rather a palaeographic interpretation of that inscription.

Students should start their drawings by focusing on an individual letter, such as *’alep*, and draw every example of that letter present within the inscription. Not only will this provide much essential practice in drawing technique, but students will begin to get a feel for the exact form of the letter that was in the mind of the scribe who executed the inscription. That is, students will begin to understand the basic shape of the letter that the scribe was trying to achieve and possibly the way he was moving his hand in order to achieve it, namely his scribal ductus.

34 See Johns Hopkins University Sheridan Libraries Center for Educational Resources, <<http://www.cer.jhu.edu/>>, accessed on 10.04.19.

FIGURE 9.14 Producing digital drawings and script charts that indicate the ductus of a letter form; copyrights on page IX.

Sometimes ductus can be seen clearly, sometimes it cannot; and students learn much from being forced to struggle to ascertain it. If students are working with an inscription wherein ductus can be determined, they should endeavor to indicate this ductus in their drawing. This can be done by superimposing a layer over their drawing whereon the order and direction in which strokes were made are indicated by numbers and arrows placed on top of each of the letter strokes, or by color-coding certain strokes (Fig. 9.14).

Digital drawing tools greatly facilitate the analysis of palaeographic data. One obvious way that examples of letter forms might be readily compared to each other is by copying and pasting them side-by-side. Examples might also be superimposed on top of each other, and Adobe Illustrator allows one to alter the transparency of one's drawing in order to perform quite detailed comparison (Fig. 9.15). This especially facilitates the comparison of solid, well-preserved letter examples and mere traces of a letter.

After students have drawn and begun to understand the morphology and ductus of the first letter of an inscription, they should repeat this process for each successive letter. They should make notes about these aspects as they draw, and based on these notes they should later be able to formulate a written description of each letter that corresponds to the form they have drawn.

FIGURE 9.15 Using Adobe Illustrator to facilitate detailed comparison of the letter forms of the Kerak fragment (Kerak Museum, No. 6807); copyrights on page ix.

4.4 *Digital Script Charts*

Palaeographers use script charts to show the ideal form of each of the letters present within an inscription. Script charts facilitate easy comparison of the script of an inscription with other inscriptions written in the same script tradition, in the same chronological period or over several periods. They also make it easy to compare an inscription (or multiple inscriptions) written in one script tradition with inscriptions written in a different tradition (Figs. 9.16-17).

Digital drawing tools allow for relatively easy construction of script charts, as letters can be copied directly from a digital drawing and pasted into a digital chart. They also enable a palaeographer to craft a chart with greater precision and to retain crucial diagnostic information about each letter in the chart. For example, when pasting a letter from a drawing into a script chart, one can more easily preserve the relationship of a letter to the scribal guide line by using various guides and measuring tools available within Adobe Illustrator (Fig. 9.18). Also, one can easily document the precise location from which a script chart letter example came (e.g., which inscription, which line of the inscription, or which example of the letter from that particular line). This can be done on a designated layer within an Illustrator file. The ability to 'copy and paste' letters from a drawing also facilitates the illustration of palaeographical discussions by enabling a scholar to paste letter examples (in the margins) directly alongside written letter descriptions (Fig. 9.19).

FIGURE 9.16 Digitally produced script chart of eighth-century BCE Hebrew cursive inscriptions; copyrights on page IX.

FIGURE 9.17 Digitally produced script chart of eighth-century BCE Aramaic cursive inscriptions; copyrights on page IX.

FIGURE 9.18 Adobe Illustrator's measurement tools being used on an image of the Honeyman inscription (Cyprus Archaeological Museum, No. 397); copyrights on page ix.

The Phoenician Letter Forms:

'alep – In the ninth century BCE, the head of 'alep in the Phoenician script is formed by two oblique lines that meet in a v-shaped nose on the left side (Nora stone). During the eighth century, another form of 'alep appears in the Phoenician corpus (Karatepe inscriptions). This new form has a head made with more parallel and less oblique strokes and anticipates the eventual breakdown of 'alep's head into two, short parallel lines in the seventh century.

In the first half of the ninth century, 'alep's vertical shaft is the same length both above and below its head (Honeyman inscription). During the latter half of the ninth century, this vertical shaft elongates downward, stretching further below its head than above (Kilamuwa stele). This stem elongation is also seen in the eighth century in Phoenician inscriptions (Karatepe inscriptions).

Phoenician 'alep may be distinguished from Hebrew and Aramaic 'aleps by the eighth century. In this period Hebrew 'alep develops a tick on the right side of its bottom oblique head stroke (Samaria ostraca), and Aramaic 'alep has a star-shaped appearance (Nimrud lion weights).

4
Nora Stone

f
Karatepe Inscriptions

x
Honeyman Inscription

f
Kilamuwa Inscription

f
Karatepe Inscriptions

f
Samaria Ostraca

x
Nimrud Lion Weights

FIGURE 9.19 Illustrated palaeographic discussion of the letter 'alep in the Iron II Phoenician script; copyrights on page x.

Obviously to become a skilled epigrapher requires more experience than one can acquire in a course or two. It takes much practice to hone the skills necessary to produce a sound epigraphic study. However, as with any course, students can be introduced to the methods and principles of a particular field and to the various issues inherent in producing sound analyses. By showing students how one might move from studying inscriptions theoretically in a classroom to producing an actual study of an inscription based on the use of high-quality images, one can greatly facilitate their transition to independent, authoritative scholarship.

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35 See footnote 1 above.

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