Teaching (Digital) Epigraphy

Abstract

Direct access to primary sources is often problematic. Especially when training students, books and photo cannot replace direct experience with the real object. In this article we present our experience with teaching students to transcribe and interpret of Roman inscribed lead tags, using Reflection Transformation Images (RTI) in a web environment, so to develop basic competences in epigraphy and digital epigraphy.

Keywords

Educational project, digital epigraphy, traditional epigraphy, open access, primary sources

1. Introduction

Although undergraduate students are naturally attracted to inscriptions and epigraphy affords them an important window on the past, nevertheless undergraduates are seldom given the opportunity to study inscriptions directly, much less those documents which are not fully published. This is because epigraphical work is seen as the specialist's domain: the analysis of such material generally requires a rather high level of expertise, normally acquired during graduate studies and beyond. Lacking sufficient skills and knowledge to comprehensively understand often complex epigraphic data, undergraduate students are simply unable to offer the expert opinions sometimes sought by a project manager. Thus, offering undergraduate students the opportunity to tackle tasks usually reserved to their senior colleagues is certainly not a common occurrence. In our small project entitled "Pedagogical, Scientific & Technical Experiment in Digital Epigraphy: the Study Case of the *Tesserarum Sisciae Sylloge* (TSS) through a Digital Autoptic Process (DAP)" we aimed to challenge this state of affairs. Using digital methods and a custom-designed course of rapid study, we were able, with the collaboration of colleagues and M.A. students in Digital Humanities at the University of Pisa, to offer undergraduates the opportunity to tackle epigraphic tasks usually reserved to their senior colleagues. We made use of newly-digitized epigraphic material: Roman commercial lead tags from ancient Roman Siscia, which had recently been processed with the help of Reflectance Transformation Imaging.

2. Epigraphic primary sources

The Roman Department of the Archaeological Museum in Zagreb contains close to 1200 of these inscribed lead tags found in Sisak, the ancient city of Siscia, one of the largest urban centres in south-western Pannonia. Most of them were found during the dredging of the Kupa river before World War I. Since the dredging was localised in the very centre of the town, i.e. in front of the old Roman port quarter, it would seem that all the tags come from a limited area. All of those tags are small lead tablets, of a more or less rectangular shape, pierced with a hole so that the tag could be attached to the bags containing the merchandise or to the merchandise itself with a small rope or a metal wire. They all carry an inscription, sometimes only on one side, but usually on both sides. Those inscriptions are always, up to now, written in capital letters or the older Roman cursive, sometimes even in a mixture of both. Most of the tags were reused several times and thus one can often see traces of older inscriptions, i.e. they are palimpsests. Those inscriptions generally follow the same model: on one side, one can read personal names, while the other side of the tag usually carries an inscription mentioning the merchandise, most of the time in an abbreviated form, as well as a price - normally expressed in *denarii* or fractions of the *denarius* - and quite often an indication of quantity or weight.

Let's see now in a traditional printed edition what would be the realistic representation of this primary source to understand that students could not learn to decipher such material from such a picture. Here is the picture of the tag with inventory number 12 583 drawn from a print edition.

Although many different commercial industrial activities could be in play, there is no doubt that most of the tags, if not all, are linked to the wool trade and the textile industry. Words like *LANA, PAN(N)UM, TVNICA, SAGVM, P(A)ENVLA, PAL(L)A, PALLIOLUM*, *LODIX*, *BANATA* and *ABOLLA* appear regularly enough without being abbreviated and thus the interpretation of common abbreviations like *L, LA, LAN, PAN, T, SAG, PAENV, PAL, LO, LOD, LODI, BANA, AB* is not in doubt. The other abbreviations are mostly related to terms of colour. The prices on those tags are a major argument when one considers those lead tags as commercial tags: those prices were indicating the value of the goods or the cost of a given service like cleaning, fulling or dyeing and it would appear that they were used by fullers and dyers as ownership labels. By noting the name of the client as well as the type of cloth or service and the price on the tag which was subsequently attached to the item to be processed (i.e. cleaned or dyed), shop owners could easily return their property to the clients as well as charge them the correct fee[1]. In order to consider the value and usefulness of the digital autoptic process in this particular case study, the fact that the students had no real background in Latin palaeography was actually more of an asset. Indeed, if untrained students with few basic skills can use the digital edition as a specific medium without too much difficulty, albeit under supervision of specialists – in Digital Epigraphy, in Ancient History, in Archaeology, in Epigraphy, in Computer Graphics and in Digital Humanities – then the whole concept would appear as convenient and appropriate for similar case studies and research.

3. difficulties and technical solutions

In fact, the transcription and interpretation of Roman inscribed lead tags are more often than not a real challenge, and so we did not know how far we could go with these students if useable results would ensue. Obviously, we had to make a selection of tags to be subjected to the adequate digitization process we chose to work with (RTI, see technical section below) and students had to study only 40 tags, a small but nevertheless

[1] cf. Radman-Livaja 2007; Radman-Livaja 2011; Radman-Livaja 2013; Radman-Livaja 2014; for analogous labels cf. Mócsy 1956, 97-104; Egger 1963: 185-197; Egger 1967, 195-210; Weber 1971, 229-234; Solin 1977, 145-164; Weber 1979, 489-490; Weber 1981, 29-31; Schwinden 1983, 20-26; Frei-Stolba 1984, 127-138; Frei-Stolba 1985, 65-70; Schwinden 1985, 121-137; Marengo 1989, 35-63; Römer-Martijnse 1990; Römer-Martijnse 1997, 5-48; Feugère 1993, 301-305; Weiss 1991, 211-220; Schwinden 1993, 215-222; Schwinden 1994, 25-32; Paci 1995: 29-40; Bassi 1996, 207-216; Bizzarini 2005:, 121-135; Buchi and Buonopane 2005, 43-51; Wedenig 2009, 104-112; Cresci & Pettenò 2010: 42-110; Jacques and Hoët-Cauwenberghe 2010, 295-317; Annibaletto & Pettenò 2012: 435-449; Frei-Stolba 2012, 331-339; Radman-Livaja 2013 bis: 165-172; Wedenig 2013, 237-246.

representative sample of the whole corpus. This overview of the corpus included different kinds of inscriptions, including both easily readable specimens and more challenging graffiti (see the e.g. of lead tab no. 12583 below). One may also profit from the assistance of undergraduate and graduate students, which could not often be the case before[2]. This experiment showed that their contribution can be useful, because technology may compensate for their lack of knowledge although the final conclusions have to remain in the domain of scholars familiar with the subject. In any case, this experiment shows how the digital edition may allow both scholars and students to have an open access to what is basically a primary source (presented as a digital facsimile).

Bringing lead tags to students thanks to RTI on the web

Due to the material properties of the lead labels, it is impossible to capture the appearance of the letters with a single image. When holding a label it is necessary to change the light angle to enhance the different marks on the surface. RTI is a computational photography technique that enables the interactive re-lighting of the observed object from any light direction. This is accomplished combining into a single compact data structure a set of fixed camera photograph taken under many different illumination conditions. The acquisition process is inexpensive and does not require labor intensive steps, unlike 3d model acquisition. RTI visualization allows the user to virtually 'tilt' the object and recreate different lighting conditions. Another advantage is the magnification provided by the high resolution camera employed. The widespread adoption in browsers of WebGL (Khronos group 2009) recently enable RTI visualization on the web. We used the RTI web-viewer developed by Visual Computing Lab, ISTI-CNR. High resolution re-illuminable images allow the selection of the best view for each mark, thus allowing the user to obtain an adequate readability of the lead tags through an intuitive interface. Another important advantage of having the tags available online is that the students can easily compare a tag with any other tag already in the database and compare occurrences of a letter in other already transcribed tags.

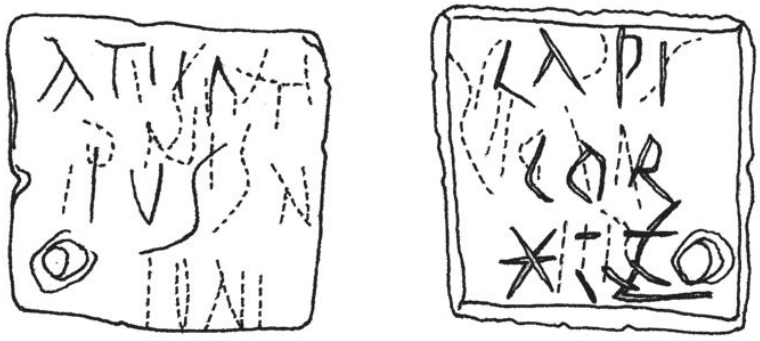
Or course, learners could train themselves on the drawing of the tag (fig. 1 and 2 below), but they would not learn to face the difficulty of interpreting the numerous ambiguities and the responsibility of deciding what is on the label.
For this EAGLE 2016 conference occasion, we have chosen as a case study the tag 03.13 (inv. 12582; Radman-Livaja 2014: cat 03.13, 347), found in the Kupa river in Sisak and offered by Andrija Colussi to the Archaeological Museum in 1898. It is a rather typical lead label of an irregular rectangular form, pierced with a hole . Its size (22.7x22.8x2.4 mm) corresponds fairly well to the average size of other specimens found in Siscia. Although its surface is rather damaged and shows clear traces of erasure, the most recent inscription remains quite readable. However, many traces of an older record (or several older records?), complicate significantly the transcription and the interpretation. The last inscription can be read, nevertheless, but it demands a certain effort and quite a lot of experience in Latin palaeography:

Obverse	**Reverse**
Ateṛ	la(na) p(ondo) i
ivs	cor(ticea)
(older inscriptions)	X =– £
Ṣiiẋṭi	(older inscription)
i onis n	. . . s
i . n i	. . v

[2] The Laboratorio di Cultura Digitale of the University of Pisa applied the didactic model DIGICRAFT. This means that undergraduate students might share their skills, especially the digital one, in order to allow an entire team to reach its goal. For more information see: http://www.labcd.unipi.it/laboratorio

It is far from certain that the inscriptions on the obverse and reverse are contemporaneous and we may not affirm with confidence that the individual named Aterius has something to do with the small quantity of wool mentioned on the obverse. The price is rather low, since the value of the transaction appears to be only 1 *sestertius* and 1 *dupondius*, i.e. 6/16 of a *denarius*.

The remains of older inscriptions are not of much use as far as transcription is concerned, but few personal names must have been present. As a case study, such a tag was particularly interesting for our experiment. It is quite a challenging inscription, even for a skilled epigraphist and paleographer, and we were definitely looking forward to find out how efficiently the students would tackle it. Thanks to the RTI, the transcription was not utterly difficult for most students. Obviously, in the first instance, the interpretation was beyond their means, but we were nevertheless impressed by the fact that they were able to read it far more easily than expected. The RTI definitely offers the possibility to work on such material online, without the obligation to inspect it personally, at least in the first stage.



Thus, students had to face similar issues as scholars who first tackled those epigraphic finds. However, the students had one significant advantage, despite their lack of experience and skill. This major advantage was RTI, which considerably improved their odds. Despite their lack of elaborate knowledge on the subject, we managed to train them to develop some necessary skills in order to be able to read the inscriptions as well as offer offer meaningful transcriptions, thanks to the help of digital facsimiles. It was indeed really gratifying to observe their enthusiasm during the experiment as well as their delight when they realised they could do it. Naturally, despite the RTI, such scientific analysis still requires skilled scholars, but with the help of technology, digital editions may be thoroughly checked and amended far more easily. Besides giving an opportunity to further study the primary source and amend the paper editions and publications, it also allows university teachers to train future scholars and specialists, wherever their geographic location may be. In this particular case, the epigraphic material is in Croatia but the analysis was done online by scholars and students from Canada and Italy. We believe that digital epigraphy has a role to fulfill in university teaching but one needs to establish right protocols and rigorous methods in order to warrant access to documents and ensure further development of such teaching methods aiming to improve the formation of future specialists.

Gaining this expertise requires time. When a museum welcome students to train them, times are often limited due to limited means (e.g.: costs, limited availability of senior epigraphers and archaeologists…). In addition, the epigraphic material may be fragile and delicate: the less these are manipulated by hands the best it is for their preservation. How to find a compromise that allow to train people everywhere in the world respecting those

well-known limits? Would the digital facsimile could represent a useful intermediary steps that allows to train for both epigraphic and digital skills? If so, should we think to renew partially, on some few aspects, the way we train learners and reconsider who teaches what and how in order to ensure the transmission of epigraphic tradition and the acquisition of good digital skills whether to train eminent specialists or to allow access to the roots of societies to the greatest number?

4. Conclusion

From the educational standpoint, this pilot project succeeded tremendously. The students who undertook this transcription in place of the usual research essay were, on average, far more motivated than their peers, and took great pleasure and pride in their work. One student, whose cumulative grade at university to this point was below average, excelled in this project and said that this was what he imagined university studies were going to be like. Two others prepared a presentation based on this effort, and it was accepted as a 15 minute lecture at the university's annual undergraduate research seminar.

Some of the uncommon qualities of these materials made them particularly able to be studied by undergraduate students with little or no Latin. The transcription of the tags' oddly shaped letters was a skill that any person literate in a Latin-script language (but not necessarily in Latin) could acquire. Indeed any additional understanding of Latin grammar and syntax afford a reader little additional advantage, given the tags' copious abbreviations. The tags' frequent and regular use of symbols and numbers meant that the latin-less student could nevertheless quickly begin to 'read' the tags, or at least glean information from them.

However much the student researchers' enthusiasm compensated, there were some impediments which will need to be removed before a large number of students can undertake this work. First, to unilingual Anglophone students, the research materials on the tags are daunting because little of it is available in English. (Because we pointed out this problem at the project's start, our volunteers were mostly Canadians who could read French as well as English.) Second, a written guide for the use of the RTI-visualization software would be needed to help beginners when they use it.

Bibliography:

Annibaletto & Pettenò 2012: M. Annibaletto, E. Pettenò, *Laminette plumbee da Iulia Concordia: alcune riflessioni sui commerci e sulla lana*, in La lana nella Cisalpina romana. Economia e società, Studi in onore di Stefania Pesavento Mattioli, Atti del Convegno Internazionale (Padova-Verona, 18–20 maggio 2011), Antenor Quaderni 27, a cura di Maria Stella Busane e Patrizia Basso, Padova, 2012, 435–449

Bassi 1996: Cristina Bassi, Tre lamellae perforatae da Savazzona-Quistello (Mantova), *Epigraphica. Rivista Italiana di epigrafia* LVIII, 207-216

Bizzarini 2005: Lavinia Bizzarini, Quattro laminette plumbee da Altino, *Annali del Museo Civico di Rovereto* 21, 21-135

Buchi and Buonopane 2005: Ezio Buchi and Alfredo Buonopane, Le etichette plumbee rinveute a Feltre: aspetti onomastici, lessicali, economici e tecnici, in: *I territori della Via Claudia Augusta: Incontri di Archeologia / Leben an der Via Claudia Augusta: Archäologische Beiträge*, herausgegeben von / a cura di Gianni Ciurletti e Nicoletta Pisu, Trento, 43-51

Cresci & Pettenò 2010: G. Cresci, E. Pettenò, *Supellex ex plumbo. Laminae Concordienses.*

Le laminette commerciali da Iulia Concordia, Atti del Istituto Veneto di scienze, lettere ed arti, Classe di scienze morali, lettere ed arti, 168, 2009–2010, 43–110

Egger 1963: Rudolf Egger, Epigraphische Nachlese, Bleietiketten aus dem rätischen Alpenvorland, *JÖIW* 46 (1961-1963), 185-197.

Egger 1967: Rudolf Egger, Fünf Bleietiketten und eine Gussform: die neuesten Magdalensbergfunde, *Anzeiger der philologisch-historische Klasse der Österreichischen Akademie der Wissenschaften* 104, 195-210

Feugère 1993: Michel Feugère, Une étiquette inscrite en plomb, Les fouilles de la Z.A.C. des Halles à Nîmes (Gard), *Bulletin de l'École Antique de Nîmes*, *Suppl*. 1, 301-305

Frei-Stolba 1984: Regula Frei-Stolba, Die Bleietiketten von Oberwinterhur-Vitudurum, *Archäologie der Schweiz* 7, 127-138

Frei-Stolba 2011: Regula Frei-Stolba, Les étiquettes en plomb: des documents de l'écriture au quotidien, in: M. Corbier and J.-P. Guilhembert (dir.), *L'écriture dans la maison romaine*, Paris, 331-344

Frei-Stolba 2012: Regula Frei-Stolba, Les étiquettes en plomb et la graphie des fractions du denier, in: M. E. Fuchs, R. Sylvestre and C. Schmidt Heidenreich (dir.), *Inscriptions mineures: nouveautés et réflexions, Actes du premier colloque Ductus (19-20 juin 2008, Lausanne)*, Bern, 315-325

Jacques & Hoët-Cauwenberghe 2010: Alain Jacques and Christine Hoët-Cauwenberghe, Artisanat et commerce: Les étiquettes de plomb inscrites découvertes à Arras (Nemetacum), *Revue des Etudes Anciennes* 112(2), 295-317

Marengo 1989: Silvia M. Marengo, Etichette plumbee ed altro instrumentum iscritto su metallo da varie località del Maceratese, *Picus. Studi e ricerche sulle Marche nell' antichità* 9, 35-63

Mócsy 1956: András Mócsy, Olom árucímkék Sisciából (Bolli romani da Siscia), *FA* 8, 97-104

Paci 1995: Gianfranco Paci, Etichette plumbee iscritte, *Acta Colloquii Epigraphici Latini, Helsingiae, 3.-6. sept.1991 habiti*, *Commentationes Humanarum Litterarum* 104, 29-40

Radman-Livaja 2007: Ivan Radman-Livaja, *In Segestica...*, Prilozi Instituta za Arheologiju u Zagrebu 24, 2007, 153–172

Radman-Livaja 2011: Ivan Radman-Livaja, *Le rôle des étiquettes de plomb dans le travail du textile à Siscia*, PURPUREAE VESTES, III Symposium Internacional

sobre Textiles y Tintes del Mediterráneo en el mundo antiguo (C. Alfaro, J.-P. Brun, Ph. Borgard, R. Pierobon Benoit, eds.), Valencia / Napoli, 2011, 181–196

Radman-Livaja 2013: Ivan Radman-Livaja, Craftspeople, Merchants or Clients? The Evidence of Personal Names on the Commercial lead tags from Siscia, in M. Gleba and J. Pásztókai-Szeőke (eds.), Making Textiles in Pre-Roman and Roman Times: People, Places, Identities, Ancient Textiles Series vol. 13, Oxford, 2013, 87-108

Radman-Livaja 2013 bis: Ivan Radman-Livaja, Two Lead Tags from Štrbinci *(Certissia?),* Arheološki radovi i rasprave 17, 2013, 165-180

Radman-Livaja 2014: Ivan Radman-Livaja, Plombs de Siscia, *Musei Archaeologici Zagrabiensis Catalogi et Monographiae,* vol. IX, Zagreb, 2014

Reuter and Scholz 2004: Marcus Reuter and Markus Scholz, Geritzt und entziffert, Scriftzeugnisse der römischen Informationsgesellschaft, *Schriften des*
Limesmuseums Aalen 57, Esslingen am Neckar, 2004

Römer-Martijnse 1987: Elizabeth Römer-Martijnse, Ein beschriftetes Bleitäfelchen – Zeugnis handwerklicher Tätigkeit in Carnuntum?, *Carnuntum Jarbuch* 1987, 119-122

Römer-Martijnse 1989: Elizabeth Römer-Martijnse, Römerzeitliche Bleietiketten aus Kalsdorf, Steiermark, *Akten des 3. Österreichischen Archäologentages Innsbruck*,
Wien, 171-174

Römer-Martijnse 1990: Elizabeth Römer-Martijnse, *Römerzeitliche Bleietiketten aus Kalsdorf, Steiermark*, Wien.

Römer-Martijnse 1997: Elizabeth Römer-Martijnse, Eine frühkaiserzeitliche Handelsstation an der Via Claudia Augusta im Forggensee bei Dietringen, Lkr. Ostallgäu, *Alt Füssen, Jahrbuch des Historischen Vereins Alt Füssen, Jg. 1996 und Jg. 1997*, W. Czysz und E. Römer-Martijnse, Teil II, Die beschrifteten Bleietiketten, 5-48

Schwinden 1983: Lothar Schwinden, Handel mit Pfeffer und anderen Gewürzen im römischen Trier, *FABT* 15, 20-26

Schwinden 1985: Lothar Schwinden, Römerzeitliche Bleietiketten aus Trier, Zum Handel mit Pfeffer, Arznei und Kork, *TZ* 48, 121-137

Schwinden 1993: Lothar Schwinden, Zwei römische Bleietiketten mit Graffiti aus Bliesbruck, *Blesa* 1, 215-222

Schwinden 1994: Lothar Schwinden, Asparagus – römischer Spargel – Ein neues Bleietikett mikt Graffiti aus Trier, *FABT* 26, 25-32

Solin 1977: Heikki Solin, Tabelle plumbee di Concordia, *Aquileia Nostra* 48,
145-164

Weber 1971: Ekkehard Weber, Ein Bleietikett aus Immurium-Moosham, *JÖIW*
49 (1968-1971), 229-234

Weber 1979: Ekkehard Weber, Beschriftete Bleitesserae, eine bisher wenig beachetete Denkmälergruppe, *Actes du 7. Congrès International d'épigraphie grecque et latine (Constantza, 9-15 septembre 1977)*, Bucarest-Paris, 489-490.

Weber 1981: Ekkehard Weber, Ein beschriftetes Bleitäfelchen, in: Mathilde Grünewald, *Die Kleinfunde des Legionslager von Carnuntum mit Ausnahme der Gefässkeramik (Grabungen 1969-1974)*, Wien, 29-31.

Wedenig 2009: Reinhold Wedenig mit einem Beitrag von Michaela Kronberger, Ein Bleietikett mit Zenturiengraffito von der Freyung in Wien 1, *Fundort Wien, Berichte zur Archäologie* 12, 104-112

Wedenig 2013 Reinhold Wedenig, Ein Bleietikett mit Farbbezeichnung vom Residenzplatz in Salzburg-Iuvavum, in: P. Mauritsch and C. Ulf (Hrsg.), *Kultur(en), Formen des Alltäglichen in der Antike, Festchrift für Ingomar Weiler zum 75. Geburtstag, Nummi et Litterae*, Band VII, Graz, 237-250

Weiss 1991: Peter Weiss, Bleietiketten mit Warenangaben aus dem Umfeld von Rom, *Tyche* 6, 211-220