CHAPTER 3

Description, translation and process: Making the implicit explicit in digital editions of ancient text-bearing objects

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Abstract

Digital editions of ancient texts and objects follow the nineteenth–twentieth century tradition of academic editing, but are able to be more explicit and accessible than their print analogues. The use of digital standards such as EpiDoc and Linked Open Data, that emphasise interoperability, linking and sharing, enables—we shall argue, obliges—the scholarly editor to make the digital publication open, accessible, transparent and explicit.

We discuss three axes of openness: 1. The edition encodes dimensions and physical condition of the inscribed object, as well as photographs and other imagery,

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and should include translations to modern languages, rather than assuming fluency. 2. Contextual and procedural metadata include the origins of scholarly work, permissions, funding, influences on academic decision-making, material and intellectual property, trafficking, ethics, authenticity and archaeological context. 3. The digital standards and code implementing them, enabling interoperability among editions and projects, and depend on consistency and accessible documentation of practices, guidelines and customisations. Standards benefit from training in scholarly and digital methods, and the nurturing of a community to preserve and encourage the sustainable re-use of standards and editions.

Ancient text-bearing objects need to be treated as material artefacts as well as the bearers of (sometimes abstract or immaterial) strings of historical text. All elements of the publication of both object and text are interpretive constructs. It is essential that we not neglect any of the material or immaterial information in all of these components, in our scholarly quest to make them explicit, interoperable and machine actionable.

الملخص

الإصدارات الرقمية للنصوص والآثار تتسق مع تقاليد القرن التاسع عشر والعشرين في النشر الأكاديمي إلا أنها أكثر وضوحًا وسهلة الوصول إليها أكثر من نظائرها المطبوعة. نحاول أن نوضح فى هذه الورقة أن إستخدام المعايير الرقمية مثل لغة (EpiDoc) والبيانات المفتوحة المرتبطة (Linked Open Data) ، والتي تؤكد على قابلية التشغيل البيني والربط والمشاركة عبر أشغلة التنظيم المختلفة ، تسمح -إن لم تكن تجبر- المحرر على جعل المنشور الرقمي مفتوح المصدر وعلى قدر كبير من الشفافية والوضوح أكثر من نظيره الورقي.

وبناءاً عليه نحاول أن نناقش في هذه المقالة ثلاثة محاور متعلقة بفكرة المصدر المفتوح في النشر العلمي: (1) وهنا نقول أن النشر العلمى الرقمى يجب أن يحتوي على المقاسات والحالة المادية للمادة (بمعنى الأثر) المكتوبة عليها النص المنشور ؛ بالإضافة إلى صورة فوتوغرافية لهذا الأثر أو غيرها من المجسمات ثلاثية الأبعاد. ويجب أن يتضمن أيضاً ترجمة للنص القديم إلى لغة حديثة ، بدلاً من افتراض أن الباحثين ملمين بهذه اللغات القديمة. (2) يجب عليه أيضاً أن يتضمن على بيانات وصفية وإجرائية لسياقات العمل الأكاديمي ، بما في ذلك تصريح النشر، والتمويل ، وغيرها من المؤثرات الخارجية على محرر النص (الناشر) بالإضافة أي بيانات أخرى متعلقة بالملكية المادية والأدبية والفكرية لوعاء النص (سواء كان أثر أو غيره من الأوعية) وكذلك غيرها من المعلومات المرتبطة بعملية الحصول على الأثر والاتجار في الوثائق ، وأخلاقيات العمل ، والأصالة ، و غيرها من السياقات الأثرية. (3) ثم أنه يجب أن يتطرق إلى المعايير الرقمية والتعليمات البرمجية التي تم تنفيذها و قابلية التشغيل البيني بين الإصدارات والمشاريع الرقمية بشكل متناسق و توثيقى بحيث يسهل عملية الوصول إلى الإرشادات التوجيهية (guidelines) والتخصيصات (customisation). كما أن التدريب على الأساليب العلمية والرقمية يساعد فى هذا المجال بحيث يرعى المجتمع الرقمي ويحافظ على هذا المنتج الرقمي ويعزز ويشجع فرص إعادة الاستخدام المستدام للمعايير والإصدارات الرقمية.

وخلاصة القول نريد أن نؤكد على فكرة أن الآثار التي تحمل نصوصاً تاريخية ليست مجرد آثار صماء بل هى فى نفس الوقت أيضاً حمّالة معاني وأن جميع عناصر النشر سواء الأثر أو النص تخضع للتفسير وإن شئت قلت تفسيرات متباينة. من الضروري ألا نهمل أى معلومة سواء مادية أو معنوية إذا ما أردنا أن نجعل هذه النصوص وتلك الآثار واضحة المعاني (explicit) وقابلة للتشغيل الرقمي البيني (interoperable) وقابلة للتنفيذ الآلي (machine actionable).

1. Introduction

Formal openness and transparency of digital editions of material, text-bearing objects, along several axes, serves social and ethical ends as well as academic communication and accessibility.[1] Producing electronic editions is an advanced academic discipline in its own right—not purely technical or secretarial work as some hidebound professors would have us believe—requiring scholarly expertise in digital encoding, philology, history and archaeology. A digital publication needs to record the traditional information about text, object description, scholarly history, attribution and metadata, and also detailed processual details and explicit links between data and interpretation that are machine actionable and robustly sustainable. The standards that enable this machine-assisted scholarly work themselves need to be transparently documented and communicated to the reader.

The authors of this chapter are experts in philological and archaeological methods, sigillography, papyrology and epigraphy, and in digital humanities methods for reading, encoding, imaging, disseminating and critiquing ancient texts.[2] As we are scholars of the ancient and mediaeval Mediterranean, our explicit focus is on antiquity; this is not to say that most (if perhaps not all) of the questions we raise are equally applicable to other periods of history and cultural areas. We are concerned with the interplay between the linguae francae of scholarship and the spoken languages of people's lives and countries of origin—in particular the disjunct between publications of Mediterranean antiquities and the ability of people whose national cultural heritage they are to read them—and the colonial legacy of these scholarly practices.

While all information that can be expressed in print publications (and much more) will generally be captured in digital editions, as digital humanists we are aware that all modelling is simplification, and digital modelling is no exception. Reducing complex records to the bits of digital data leads to occasional loss of analogue information, but our goal, by being explicit and transparent, and licensing open content for reuse, is to keep such simplification to a minimum, and empower the reader to reconstruct the processes and decisions along with as much open original data as possible.

[1] The authors would like to thank several colleagues for comments or other work that have contributed to our thinking about the topic of this chapter, including: Paula Granados García, Thomas Kollatz, Chijioke Okorie and Andrea Wallace.

[2] We shall at times use "epigraphy" in its more general sense of "text written on material objects" to encompass all of the subdisciplines represented in this chapter.

2. Transparency of the edition itself

This first axis may feature information that also customarily occurs in print editions of such texts, but that digital encoding and processing make more explicit. For instance, machine-actionable encoding of numerical or quantifiable data, such as date or dimensions, can both be displayed to readers in an accessible, human-readable form, and be rendered or transformed so as to sort, filter, index, visualise, or otherwise process the editions according to multiple criteria, including some not foreseen or designed by the original project.

Transparency, explicitness and even redundancy enhance the accessibility of the publication—to both a disciplinarily broad audience, readers from different national and linguistic backgrounds, those with different accommodations or needs, and with interests in different parts of the publication or edition.[3] The digital medium permits the presentation of multiple views of material, while avoiding repetition and duplication of effort.

We shall consider here six elements of an edition that might be made more explicit: 1. Machine-actionable encoding; 2. Full object description; 3. Presentation of the text edition; 4. Transparency of vocabularies and language; 5. Translation to modern languages; 6. Provision of or linking to supporting materials.

2.1 Machine-actionable encoding

"Machine-actionable" encoding embeds in a digital edition standardised, digital codes (whether XML or database fields) that make explicit to a processing environment information implicit to a human reader. Where a print edition may give dimensions of an object—commonly without even the abbreviations 'w', 'h' and 'd' for dimensions:

w: 0.55 x h: 0.87 x d: 0.54

The underlying XML in the EpiDoc edition of the same publication might include the code:

```
<dimensions unit="metre">
      <width>0.55</width>
      <height>0.87</height>
      <depth>0.54</depth>
</dimensions>
```

[3] We are inspired by and support the arguments (in a different discipline) of Vitale 2016; see Vitale (Chapter 1 in this volume).

This more verbose record is not necessarily entered by hand by human editors, nor read on the page, but has several benefits for the processing, interoperability and sustainability of the data behind any one publication. TEI XML is a common standard that promotes compatibility between humanities datasets (including ancient texts), and gives editors and users the opportunity to share a large body of code and software for the publication, processing and querying of these digital materials. Digital encoding, at least with a well-understood and documented language like TEI, is also a more explicit record of each dimension, especially when abbreviations may differ between languages, or not all objects may have the same dimensions given (not all objects have a recordable "depth"—letters cut on a building or a rock face, say—; circular objects may be better described with a diameter). Digitally encoding this information may also enable further computational processing of this information beyond display, perhaps including: searching for objects of certain dimensions; indexing or sorting objects of a certain size; filtering a search interface for "tiny," "large" or "huge" artefacts. Some projects might find it valuable to create an artificial visualisation of an object, for example in an automated 3D modelling library, as a wireframe onto which to project a photograph or other surrogate of the text.[4] This sort of information could be used in a process that proposes compatible fragments for a machine-assisted resolution of broken texts or objects (e.g. Koller & Levoy 2006; Lewis 2015; Toler-Franklin et al. 2010; Reggiani 2017: 152–54; Brusuelas 2016).

Some of these suggestions may seem highly specialist or unlikely, but as with much digital work, the point of openly sharing data and encoded texts is that the reuse others make of it will be unpredictable to the creators of the original data, and what may seem overkill for the purposes of a Web publication immeasurably enhances the value and therefore sustainability of the dataset for future users.

2.2 Full object description

Epigraphy and the cognate disciplines have always involved a complex relationship between philology and object archaeology, and such interplay of skills requires interdisciplinarity or collaboration, each of which brings its own challenges.

The seeming redundancy of including a description of an object alongside a photograph (or, indeed, palaeographical description of text alongside photograph, squeeze or drawing) may be outweighed by different purposes, audiences and processes served by each representation. Multiple views and descriptions of an object may involve time and expense to produce, deliver

[4] See e.g. the Python library Mayavi: https://docs.enthought.com/mayavi/mayavi.

and maintain, so involves a cost-benefit decision, but where the question is whether to publish available data in redundant formats or views, as with digitally transformed data, the value of different views may prevail.

An archaeological photograph with scale and colour palette may be the most efficient, accurate and compelling way to communicate the shape, texture and decoration of an inscribed object to (some) human readers of an edition. Just as Web accessibility guidelines mandate the use of an `@alt` attribute to describe (or functionally explain) an image for visually impaired readers or low-bandwidth network connections or text-only browsers, both digital and print publishers should think of different consumers of their editions. As well as accessibility issues for disabled readers, we might consider that a description can be encoded and processed (as discussed above), searched as plain text or read by a screen reader, unlike images, and can be used to categorise editions by various criteria. A written description and explanation of an object is also an act of interpretation and commentary by the editor, and therefore communicates valuable expertise to a reader—and for which the photograph serves as the "raw data" against which to assess this description.

2.3 Presentations of the text edition

Analogous to parallel human-readable and machine-readable versions, and redundant image and text relating to an inscribed object, digital encoding makes it possible to publish multiple, explicitly aligned renditions of the text itself. The essential views of a text might include:

I. **Photograph** or other surrogate of the text-bearing face—this could include photographs, drawings, facsimiles, epigraphic squeezes or rubbings, 3D scans or reconstructions; or any view representing as closely as possible the appearance of the text, without that layer of editorial interpretation that comes with transcription.
II. **Diplomatic edition**—the transcription that interprets letterforms, but does not expand abbreviations, correct errors or dialect forms, or restore damaged text; most diplomatic transcriptions flatten allographs and elide palaeographical and other information visible in a photograph or the original manuscript.
III. **Interpretive edition** or editorial transcription—designed for *reading* the text, which generally normalises features such as punctuation, word spacing, use of lowercase letters, accentuation and diacritics; the editorial view also uses explicit signs (XML or the Leiden System) to expand abbreviations, restore damaged, omitted or lost characters, correct errors, normalise dialect or idiosyncratic spelling and grammar, and encode other observations about the state of the original.

IV. **Translation** of the text into one or more modern languages—a translation may be anything from a simple updating of the language (e.g. Shakespearean to modern English) to a highly transformative and even speculative rendering of the sense, but every translation is an act of interpretation, and even if aligned to the source, is a barrier between the reader and the original text. One might include multiple translations of a single text into the same language.[5]
V. **Glossaries**, and other indexed, glossed and commented views of the text or key terms within it, take a reader even further from the text, but add interpretive information to aid in understanding, supply expert context, and make a text more accessible to non-specialist readers. It is only a small step from here to the prose commentary or historical discussion of the text and its language, which take us beyond a "view" of the text itself.[6]

There may be more fine-grained taxonomies of views of a text; there are for example several kinds of "diplomatic transcription," ranging from drawings of letter-shapes and surviving fragments, to uncorrected versions of the editorial text. In an EpiDoc edition, it is in principle possible, indeed normal practice, to generate both diplomatic and interpretive views of an edition from the same underlying XML encoding of the transcribed text, given the richness, transparency and redundancy of the markup. As much information as possible to help the reader understand both the state of the surviving text and the editor's reconstruction and interpretation of it, should be accessible to the human reader and explicit in the underlying code (Bodard & Garcés 2006: 92–94; Cayless & Roueché 2009: §26–27).

2.4 Transparency of vocabularies and language

Academic writing relies on specialist, technical vocabulary to communicate clearly and unambiguously the vital concepts that emerge from centuries of

[5] See e.g. the Digital Corpus for Graeco-Arabic Studies https://www.graeco-arabic-studies.org/texts.html, which includes original Greek texts, Arabic translations, epitomes, commentaries and secondary sources.

[6] The resources, as we argued, are available. So for Classics, in a broader sense, see e.g. the Ugarit text aligner https://wiki.digitalclassicist.org/Ugarit and for papyrology, see e.g. the new Fachwörterbuch (nFWB): https://www.organapapyrologica.net/receive/PapyrusPortal_dictionary_00000418, a lexicon of papyrological terms, where Arabic and Spanish (beside the traditional English, German, French and Italian) translations of the lemmata are added.

scholarly consensus. While it is important not to use obscure jargon to exclude the uninitiated from our work, it is equally crucial that we use vocabularies—be they terms of art in dating, palaeography, art history or architecture—in a consistent, transparent, and well-documented fashion. Scholars from related fields such as epigraphy and numismatics may understand the same term in subtly different ways, and greater misunderstandings can arise from false-friends across languages.[7]

In digital editing and philology, transparency in terminology is best achieved by the use of recognised taxonomies, thesauri and ontologies, preferably adhering to Linked Open Data standards that allow terms and concepts to be addressed by means of URI—a globally unique string of characters that also serves as the Web-address definition of the concept for which it stands. We discuss in more detail below (§4.3, §4.4) the use of vocabularies and ontologies for consistency, and documentation and training for users and producers of compatible editions. An internal glossary or thesaurus—preferably hyperlinked from the relevant terms in translation and commentary—would be a valuable step in this direction.[8]

2.5 Translation to modern languages

In many contexts, English is a lingua franca of scholarship, even if in archaeology and classics there is more resistance to this monoglossy than in the sciences. It is unfortunate that as a result the vast majority of classical text-bearing objects that originate outside the English-speaking world, are published in a language inaccessible to (much of) the local public. Many Greek and Latin inscriptions and seals, and almost all papyri, originate in parts of the Greco-Roman world that are now Arabic speaking, where English is even less widely spoken than in France or Italy. In digital editions, it becomes more feasible to offer translations into modern languages, and better serve a range of audiences.[9]

It is also conventional to divide texts in different languages—including those from the same support and even in the same hand—into different corpora or databases. For instance the bilingual Greek-Arabic text of *SB* VI.9576 was

[7] Lucarelli (Chapter 8 in this volume) discusses the confusion that can arise from technical and discipline-specific terminology in the context of Egyptology.

[8] On the importance of vocabularies in Japanese archaeology, see Baba (Chapter 2 in this volume).

[9] E.g. this edition of an epitaph from Greek Cyrenaica, translated into French, English, Italian and Arabic: https://igcyr.unibo.it/gvcyr001, or this military ostrakon from Roman Tripolitania translated into English and Arabic: https://irt2021.inslib.kcl.ac.uk/en/inscriptions/IRT1518.html.

divided between the (Greek-focussed) Duke Databank of Documentary Papyri (Papyri.info), and the Arabic Papyrology Database (APD), until in 2016 Gad added the Arabic text to the Papyri.info record.[10] The editorial history at the bottom of this record in Papyri.info (compiled from `<change>` tags in EpiDoc XML and Git commit history) makes this entire process more transparent than was possible—or at least the norm—for earlier generations of editors. There remain technical issues for the encoding of (right-to-left) Arabic texts in XML, especially alongside left-to-right languages such as Greek and Latin, primarily with editing the texts in an XML or text editor, but correctly encoded XML can readily be processed and transformed. When Gad approached the editorial team of Papyri.info to propose improving the functionality of the editorial interface for bidirectional texts, to facilitate the addition of Arabic translations of papyri to the collection, the editors were sympathetic, but delayed implementing a technical solution until progress had been made on alignment with the APD. Effectively, the adoption of an approach that would facilitate the engagement of Arabic-speakers with the texts in the collection was not considered high priority at this time, despite the Egyptian origin of almost all papyri, Arabic never having been considered a scholarly language in papyrology, and Arab scholars remaining under-represented and under-served in classics and ancient history (Blouin 2018; Gad 2021: 262–263).

Not all scholars have the capability to translate their work into multiple modern languages, but many digital projects are collaborative endeavours, and opening scholarly works to a range of regional and local audiences may win the attention of the "crowd" of willing contributors, albeit introducing logistical issues of quality control, editorial oversight and consistency. The benefit in removing barriers to both non-Anglophone and non-academic audiences to cultural heritage make this a quintessential example of the transparency we address in this chapter.

2.6 Provision of or linking to supporting materials

Internal or external resources can provide information for the user or reader of an edition, including documentation of technical standards used (discussed further in §4.4); explanation or expansion of technical terms, typographic conventions (e.g. the Leiden System) and abbreviations; historical context or encyclopaedic references for disciplinary issues. Such resources might be provided as supplementary materials, serving a wider audience of the digital publication, scholars from different disciplines, students or non-academic public, via simple links or more direct engagement with external resources and reference works, primary materials and the research tools associated with them, or

[10] *SB* VI.9576, *Papyri.info*: https://papyri.info/ddbdp/sb;6;9576 and CPR III. 38, *Papyri.info:* https://papyri.info/ddbdp/cpr;3;38.

public resources such as Wikipedia articles or supporting data in Wikidata and Wikimedia Commons.

Provision of or reference to supporting materials serves to increase the accessibility of complex digital editions, and improve the transparency of the research process and sources behind the published content. The digital medium facilitates linking and access to external resources, reduces restrictions of space and cost to publish lengthy additional resources alongside often highly abbreviated critical editions (Reggiani 2017: 172).[11]

An editor does not have infinite time on her hands, or even necessarily the skills or inclination to produce unlimited supporting materials for all audiences. As discussed with reference to translations, however, there is the potential for producing better supporting materials than has been the norm, and with community goodwill we can at least begin to achieve more accessible and transparent publications. We discuss further below (§ 4.4) the importance of sustainability of open digital data, which includes supporting materials and publications.

3. Contextual and procedural metadata

Our second axis of openness is the inclusion of information about the creation and origins of digital editions. Such questions were seldom explicitly recorded in print editions, although primary and secondary sources (and less frequently details of archaeological campaigns) were noted. Due to technical and disciplinary features of digital editions, it is possible and should be standard scholarly practice to include procedural metadata (or "paradata") in both print and digital editions to contextualise scholarly editions in their historical moment. The inclusion of such metadata is a recognition of the global digital age, technologically different from earlier generations, with sociological, cultural and most importantly scholarly and ethical implications (Mazza 2021).[12]

As a general disclaimer, the authors are not legal professionals, are making no allegations or preempting the outcomes of legal cases, and nothing written in this chapter should be construed as legal advice or opinion.

[11] Elagina (Chapter 5 in this volume) discusses the advances enabled by digital study of manuscripts in recording material aspects and the role of manuscripts in modern culture.

[12] See also Okorie (Chapter 11 in this volume) on copyright law and local communities.

3.1 Scholarly process, origins, decisions

In the first publication of the Bodmer papyri, a certain vacillation is visible (Robinson 2011: 11). A roll containing documentary texts on the front was later cut into two rolls containing on the back *Iliad* 5 and 6. The two books of the *Iliad* were published with a comment to the effect that, since they are distinct entities, "from a bibliographical point of view," they would be designated P. Bodmer I and II. The single volume in which they were published was however designated *Papyrus Bodmer I* (Martin 1954); this outcome perhaps resulted from the recognition that relatively few fragments remained of the roll that had contained book 6, which did not warrant a whole separate volume, or simply the rationalisation that the documentary texts on the front had been as a single roll, or that the *Iliad* is a single work. The documentary texts will, however, only be published in a concluding volume of miscellanea as Papyrus Bodmer I Recto (Derda 2010). A codex containing only the Gospel of John was then published as Papyrus Bodmer II (Martin 1956–62; see Robinson 2011: 11). The inconsistency is not limited to the first publication of Bibliotheca Bodmeriana, but affects almost every subsequent publication of this important papyrological collection.

In the archive of Papas (P.Apoll.), linguistic barriers between Greek, Coptic and Arabic papyri and papyrology are almost meaningless. The most important factor in these two examples were the sponsors' or collector's involvement in the process of publication, and the degree of expertise of the editors responsible for the publication of the collections. The boundaries between subspecialities of papyrology are blurred, and one can argue that they are meaningless. A lot of codicological and palaeographical information could have been gained from this collection, if the story of its discovery and acquisition were explicitly documented in the first publications.

Such inconsistencies and complexities can just as easily arise in digital editions, but where possible scholarly processes, origins and publication history of the collection and its parts, and decisions made about individual pieces, should not be left for scholars to conjecture, but transparently and explicitly included in the edition.

3.2 Object provenance

Many archaeological associations and publications have strict policies on the publication of unprovenanced or trafficked objects.[13] Such rules are not evenly followed worldwide and in all academic disciplines, but it is increasingly under-

[13] See e.g. the new policy of AJA on the publication and citation of undocumented antiquities https://www.ajaonline.org/submissions/antiquities-policy; good summary of such rules and guidelines now in Nongbri 2022.

stood that encouraging trafficking, looting and unauthorised export, present or past, is irresponsible and dangerous academic behaviour.

Editions of ancient texts traditionally report on the archaeological and custodial provenance of the text-bearing object, even if constrained to a description of original context, place and circumstances of finding, and current location or holding. Questions of context and provenance have wider impact, including legal and ethical, and indeed repercussions on the archaeological and philological disciplines of an editor's engagement with exported, traded and trafficked antiquities. The recent, and still unfolding, scandal involving apparent papyrus theft from the Egypt Exploration Society (EES) collection in Oxford, reported by the EES itself and *The Guardian, Atlantic* and other newspapers (Gad 2019). The equally controversial fake Coptic fragment dubbed the Gospel of Jesus' Wife, whose acquisition history is recounted by Ariel Sabar in works that strip bare the internal workings of our academic field (Sabar 2016; Sabar 2020).

Beyond these blockbuster stories, which harm the public image of the discipline, editions of inscriptions, papyri and related texts will gain much from being explicit about the provenance, acquisition and curation of ancient artefacts, and sensitive to the ethical and intellectual property issues around working with private collections and recently auctioned materials. Such transparency is needed beyond digital editions, but technologies such as Linked Open Data, hypertext, faceted views and Web archives make possible linking to and preserving online resources, holding institutions or auction houses, displaying explicit information without obscuring scholarly edition and commentary, and offering accountability and ethical data reuse.

Given the history of both colonial and post-colonial looting, in which almost all collections in North America, Europe, the Middle East and Japan have been assembled,[14] transparent publication and the use of open data and open licensed materials (where this would not constitute further pillaging of intellectual heritage) becomes an ethical—if not a legal—obligation.[15] It becomes feasible to link editions of text-bearing objects to websites of holding institutions, with precise information about intellectual property; to auction houses or purchase records with dates, provenances, regulations, and other

[14] For more detailed and/or evidence-based research on the illicit trade of cultural objects, see the website of the project "Trafficking Culture" https://traffickingculture.org/projects/.

[15] Pavis & Wallace 2019 discuss the importance of not re-colonising stolen heritage digitally; Okorie (Chapter 11 in this volume) highlights the issue of control; Bianchini (Chapter 4 in this volume) discusses the importance of transcending colonial views of ancient objects.

necessary documentation of the acquisition process.[16] Hypertext, the fundamental and original characteristic of the internet, allows a digital edition to offer information that print editions omit due to limitations of space. We need to take advantage of this medium to add all available, accessible and known information, whether online or in excavation archives (van Minnen 1994). Some sensitive information cannot be shared publicly, but even where a piece is published first in an academic journal or book, when this becomes available online, more information may be added in the process of digitization and analysis.

3.3 Permissions

Historical and contemporary permissions, or indeed denial of such, to publish archaeological finds should be acknowledged in digital editions. Many libraries and museums have made archives wholly or partially available online, making a wealth of information available for editors. With private or not-yet-digitised institutional collections, it is the responsibility of authors and publishers to avoid vague formulations about historical agreements and communications with the source country. In Egypt, for instance, it is increasingly recognised that any text-bearing object not explicitly mentioned in an agreement or correspondence between the holding institution and Service des antiquités de l'Egypte, the Supreme Council of Antiquities, or the Ministry of Culture, is likely trafficked. Given that most of the source countries in the Middle East and North African region use traditional documentation of permissions to track archaeological objects, we must balance the digital divide in the world of online editions by exhausting every avenue to communicate with these institutions to avoid rights encroachment. Simultaneous editions of the same text have been dismissed as "not intentional trespasses on the AIP's guiding principle of *Amicitia Papyrologorum*" (Gad 2016). These unintentional trespasses in printed editions can be avoided in digital editions and databases; the key is transparency and openness concerning assigned numbers and the assignment policies and procedures of the holding institutions, even if there is no explicit metadata field or element for this purpose in our encoding models.[17]

Quite apart from legal copyright issues, the common practice of excavators or museums assigning first-publication rights for a body of texts to a given scholar, also impacts on digital publication. While not a legal barrier to publication by others, the practice can have repercussions on good relations, repu-

[16] See the UNESCO's database of legislative texts governing the protection of movable cultural property, e.g. Egypt at: https://unesdoc.unesco.org/ark:/48223/pf0000066629.

[17] This shortcoming is currently under consideration by the EpiDoc community.

tations, and even careers. It is frustrating to see texts that have repeatedly been seen in the field, but are reserved for publication by a scholar who has "sat on" them for years or even decades; many editors are however loath to break such reservation protocols out of politeness or fear of senior colleagues. Even in digital projects, many editors do not question this convention (Feraudi-Gruénais 2020). Equally with coins or lead seals commonly held in private collections, we argue that it is ethically imperative to make such unofficial or "gentlemanly" understandings explicit in the publication of the texts, whether the editor is the beneficiary of such an assignment, or has chosen to circumvent it.

It is critical that the institutional archives of major collections, themselves part of the publication record of papyri, inscriptions and other text-bearing artefacts, follow robust transparent, explicit, openly licensed practices. These holding institutions are best qualified to record and communicate information about acquisition history of collections, correspondence with agents in source countries, and other questions of provenance and materiality. Digitisation of archival materials and their inclusion in canonical text and object records becomes crucial for the interpretation of these ancient texts. The Michigan Papyrus collection exemplifies such practice (Haug 2021) for any other institution that claims to hold scholarly information about ancient heritage, including for instance the collection of papyri at the Egyptian Museum in Cairo. This is not to criticise any institution for their history or question the legality of acquisition, but to preserve all information to recontextualise collection objects in their historical and cultural moments (Hickey 2009).

3.4 Funding and other conflicts of interest

The source of funding for an editorial project, whether institutional budget, public or private grants, is a key element in the power dynamics behind contemporary and historical development of collections. "The shortage of money", as Nongbri put it, was the most likely reason behind Grenfell and Hunt's "hectic working pace and less-than-ideal record keeping" in publishing the early volumes of Oxyrhynchus papyri. Annual reports and letters reveal that financial concerns affected the whole scholarly process: "In Egypt, their goal was to extract as much papyrus as possible for the fund in as short a space of time as possible. […] Back in England, the objective was to publish the material as quickly as possible. […] Under these circumstances, it is unsurprising that so little contextual archaeological information was published" (Nongbri 2018: 223). Funding from fossil fuel and arms industries, antiquities dealers, colonising and other repressive regimes, and so forth, are a concern in academia (e.g. Mathiesesn 2021; Khomani 2022; Balter 2006; Vasagar & Syal 2011). Even beyond these overtly problematic cases, all funding carries expectations and agendas,

and inclusion of the sources of such funding in editorial metadata should be a default.[18]

One of the goals of Nongbri's project EthiCodex, is to "Make a systematic canvassing of museum and library collections containing ethically acquired early papyrus and parchment books to determine willingness to have AMS radiocarbon analysis carried out on their early codices and then fund this analysis."[19] This strict rule, ensuring that funding is not spent on the study of unethically or illegally acquired texts, is in accordance with UNESCO Conventions.[20] All of the contextual, procedural and ethical concerns discussed in this paper are tied up with sources of funding. Along with overt conflicts of interest, all possible influences from professional relationships, financial benefit, contractual obligations, and the history of institutions and collections, should be flagged as explicitly as possible in digital editions.

4. Documenting digital standards

Our third axis of openness concerns recording, documentation and dissemination of digital standards (including those discussed in §2.1). The implementation of open digital standards strongly incentivises the scholar to make her publication open and transparent, and to convey information explicitly. This task requires digital standards to be employed consistently and accompanied by documentation of practices. In this sense "documentation" includes not only guidelines and recommendations, but also divergences from and customisations of the core standard, and materials for teaching and training.

For the sake of this argument, we shall analyse four features related to the documentation of the digital standards: 1. transparency of practice and code; 2. consistency; 3. training and dissemination; 4. development and sustainability.[21]

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[18] In point: the volume in which this chapter appears could not have been published without the grant of monies from Furman University, a private US institution, and the University of London, a publicly funded university.

[19] The Early History of the Codex: A New Methodology and Ethics for Manuscript Studies: https://earlyhistoryofthecodex.com/about/.

[20] UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage: https://whc.unesco.org/en/conventiontext/.

[21] For discussion of the FAIR and CARE principles of open publication of cultural heritage materials, see the thorough discussion in Granados & Ashley (Chapter 9 in this volume).

4.1 Transparency of practice and code

Along with transparency of vocabularies and language (§ 2.4 above), an effective community of practice relies on transparency of practice and code, including accessibility of source code and training materials to users and readers of conformant editions. EpiDoc, "an international, collaborative effort that provides guidelines and tools for encoding scholarly and educational editions of ancient documents" (Elliott et al. 2021), is an active and growing community of practice in epigraphic encoding and digital publication, and ensures transparency both among users and in outreach through:

1. creation, maintenance and regular updating of detailed guidelines;
2. presence of code repositories, open licensed and freely available to all users, on free software development platforms;[22]
3. documentation of each new code release;[23]
4. mailing lists and fora for exchange of information, code samples and peer guidance.[24]

Version control is key to transparency and accountability: "by increasing the significance of version control, research transparency and critical discussion could be improved" (Bürgermeister 2019: 187). The EpiDoc community has established versioning practices for source code, documentation and, in most cases, content encoded in EpiDoc. Each release of the source code and of the guidelines is documented in release notes, and available as static XML in a dedicated repository.[25] Within EpiDoc files the element `tei:revisionDesc`, containing one or more `tei:change`, is used for a change log of each file, alongside commit messages in version control repositories.[26]

```
<revisionDesc>
 <change when="2010-08-18" who="#GB">Converted
   from TEI P4 (EpiDoc DTD v. 6) to P5 (EpiDoc
   RNG schema v. 8)</change>
 <change when="2009-05-19" who="#RV">Added Fig-
   ures</change>
 <change when="2008-09-09" who="#ZA">converted
   using CHET-C</change>
</revisionDesc>
```

[22] EpiDoc Github repositories: https://github.com/EpiDoc.

[23] EpiDoc Release Notes: https://sourceforge.net/p/epidoc/wiki/LatestRelease.

[24] Markup list: https://wiki.digitalclassicist.org/Markup_list.

[25] The release notes of the latest EpiDoc release, v.9.5, are available here: https://github.com/EpiDoc/Source/releases/tag/v9.5/.

[26] This example refers to *IRT2021*, n. 25, available: https://irt2021.inslib.kcl.ac.uk/en/inscriptions/IRT0025.html.

4.2 Enforcing consistency: vocabularies, ontologies and authority files

Indices serve two roles, at the beginning and end of a research process, both helping to ensure internal consistency. An index distils the essence of a larger work by one or more researchers, and constitutes for the user a gateway to the consultation of an edition. Indices of printed volumes meet these two requirements by normalising or lemmatising notable concepts. Creation of indices by hand or assisted by word-processing tools introduces human error (typographical, missed references), as attested in frequent post-publication *addenda et corrigenda*. Digital standards also help to prevent inconsistency in bibliographical abbreviations (Reggiani 2017: 31–32).

Digital standards enable consistency through controlled vocabularies, ontologies and authority files, which provide each term or entity with stable unique identifiers, indicating relations between terms, offering a core of consistency upon which projects may build and inspire new research. The community of digital epigraphists, centred around EpiDoc, are systematising and working toward consistency of data modelling via many projects using the common schema. The Epigraphic Ontology is a first step, proposed by a working group of the Epigraphy.info community (Bodard et al. 2021), building material and solidity through the experience of several projects, in turn providing them with more consistency. The related category of metadata thesauri is served by the EAGLE Vocabularies, structured data designed "to be flexible, align data, and harmonise content without forcing [any] project or publication to change […] the structure used," in the process of being enhanced and consolidated by the FAIR Epigraphy project.[27] Authority files—external, including VIAF, GeoNames or Pleiades,[28] internal to a project, or developed, shared and extended across projects and communities—enforce consistency within a corpus and between editors. Alignment of domain thesauri and ontologies to massive community resources such as Wikidata would further enhance the sustainability and interoperability of such vocabularies. Authorities signal recurring information pertaining to the text, prevent repeated entry of data and errors that may arise from human input, separate general information from specific textual content, and facilitate linking to external resources.

Consistency allows editors and users to transcend an individual corpus and create larger, connected corpora that add their biological and technological distinctiveness to the collective of reusable tools, going beyond the unique content and behaviour of individual projects, to search and cross-reference among corpora.

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[27] EAGLE Vocabularies: https://www.eagle-network.eu/resources/vocabularies; FAIR Epigraphy https://www.csad.ox.ac.uk/fair-epigraphy.

[28] Virtual Internet Authority File: http://viaf.org; GeoNames: http://www.geonames.org; Pleiades Gazetteer: https://pleiades.stoa.org/.

4.3 Dissemination and training, or how to create a broad community of practice

Digital standards depend on wide use and adoption, aided by dissemination and training in scholarly and digital methods. The EpiDoc community of practice considers training provision a major part of its mission to preserve and ensure the sustainable re-use of standards and editions.[29] Training in EpiDoc is participative, learner-focussed and practice-oriented: students learn from hands-on practice with digital encoding, while one-way training delivery from instructors is as concise as possible.[30] Training has been delivered in the framework of university teaching, as one-week intensive courses or as smaller project workshops or crash-courses attached to congresses.[31] Regardless of the setting, training often involves an international audience, with English as lingua franca, although one should be sensitive that this is not the case for all learners; students who are not able to fully follow in English are being failed by a monoglot programme. Community-driven efforts may help to overcome this obstacle, improving the implementation of localised training materials, and making them more accessible, inclusive, sustainable, and effective.

The EpiDoc community represents a positive example in this respect: all pedagogical materials used in training are multi-authored and released under licenses that permit reuse, modification and sharing with others.[32] Training materials include slideshows, short video tutorials, longer lectures on more general features of digital epigraphy, guidelines and code examples, articles and book chapters on methodology. The syllabus of training materials for each workshop offers a gentle and cumulative learning experience, which students are able to consult in the order they prefer.[33]

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[29] For a broad overview on the embedding of teaching and training within the EpiDoc community see Bodard & Stoyanova 2016: 60–63; and Bodard & Vagionakis 2022.

[30] Amongst the variety of didactic approaches employed, the so-called 'learning by doing' has proven effective in EpiDoc training events over the years, see on this Dee, Foradi, & Šarić 2016: 25–28.

[31] A list of past EpiDoc training events is maintained at: https://wiki.digitalclassicist.org/EpiDoc_Workshops.

[32] The EpiDoc community provides Open Educational Resources (OER)-enabled pedagogy where the "open" indicates that these materials are licensed with copyright licences that provide permission for everyone to participate in the 5R activities: retain, reuse, revise, remix and redistribute (Wiley & Hilton 2018: 134–135).

[33] EpiDoc Tutorials: https://github.com/EpiDoc/Tutorials includes teaching materials and individual syllabi from 2021 onwards.

EpiDoc training practice contributes to and draws on other pedagogical resources and programmes, including Sunoikisis Digital Classics[34] (Vitale, Bodard, & Berti forthcoming 2024), further enhancing durability and sustainability. Transparency is enhanced by inclusivity and accessibility, which implies taking into account (1) disability accommodations, and (2) language barriers.

1. Both the design and delivery of training events will benefit from the expertise of departments or individuals specialised in inclusive learning and e-learning.[35] It is essential to make training materials accessible and inclusive, including through the use of closed captions and translated subtitles on video tutorials, multilingual captions on slides, and slides containing explanations that are friendlier to assistive technology than a parade of images and code snippets (Everett & Oswald 2018; Carballo, Cotán, & Spinola-Elias 2021).
2. Multilingual training materials cater to an ever-expanding community;[36] EpiDoc training is only offered in the main European languages (English, French, Italian, German, Spanish), but we should also consider training materials—including slideshows and captioned videos—in, or enhanced by, further languages.

4.4 Transparency and sustainability

Sustainability of digital content and technical infrastructure within the lifetime of the project depends on maintenance and renewal. It is good scholarly practice to build on and adapt existing, community solutions, avoid bespoke tools and duplication of work. Digital longevity is enabled by community engagement, however small scale: "another important aspect of sustainability that all of these projects [Nomisma, Papyri.info] exemplify is community engagement. Nomisma and Papyri.info have made themselves indispensable tools for the small scholarly communities they represent (Numismatics and Papyrology)" (Cayless 2019: 44).

Beyond the authors' active role in a project, sustainability is better achieved through diversity of hosting and archiving solutions, formats and dissemination strategies. The infrastructures that enable sustainability are seldom managed by the scholars who edit and author ancient editions; a digital humanities

[34] Sunoikisis Digital Classics: https://sunoikisisdc.github.io.

[35] E.g. we have worked with the Competence Center E-Learning (https://elearning.uni-koeln.de/), Center for University Didactics of the University of Cologne (https://zhd.uni-koeln.de/), and Centre for Distance Education, University of London (https://london.ac.uk/centre-for-distance-education).

[36] See section § 2.5 and above for multilingualism respectively in the edition (including text, metadata and commentary) and in the training itself.

centre or lab may provide expertise in data management, a digital library or publisher the physical infrastructure for online publication. A sustainable digital publication needs one or more hosting institution, repositories for data and documentation, user interface, possibly APIs and support for LOD, as well as technical and content maintenance (Aurora & Gasparini 2022). Scholars seeking funding must be explicit about the costs of such infrastructure, support and documentation. Funding bodies as well as editors need to normalise and be transparent about the life-cycle of a project, from grant bid to "graceful shutdown" (Smithies et al. 2019: 24), to avoid the risk of "digital wastelands" (Barats et al. 2020: 33).

Beyond the life of the publication itself, a digital resource may be sustainable because it contributes to scholarship beyond its own existence. Datasets licensed for download, aggregation and reuse, allow easier and more comprehensive access to users, including new avenues of research that the originating authors may not envisage. Open licensing is essential to sustainability in this context, enabling compilation, translation, commentary and other remixing that have allowed ancient texts to be transmitted to us (Cayless 2010).

5. Conclusions

We have outlined multiple axes of transparency and openness in digital editions of ancient text-bearing objects, including inscriptions, papyri, seals and coins. The explicitness enabled by these digital practices serves the reader of the critical edition, the editorial and publication process itself, and the academic obligation to consider ethical and social responsibility in research. Overlying all of the issues we consider is the need to record both materiality and material context (archaeological, geographical and historical) along with text.

The scholarly editor is concerned with all elements of the edition, material and historical information as well as description and transcription of text. Epigraphic scholarship has always included these agendas—these are multidisciplinary and collaborative disciplines, encompassing archaeology and philology; the digital editor is empowered to be more explicit about these features. An account of the scholarly process has always been an important (if under-served) element of epigraphic editing: our current transparency on the contexts of discovery, provenance, curation, access and study of our objects, does not imply that traditional editors were less aware of the colonial legacies, relationships and patronage behind scholarly permissions and access, the intersections between intellectual property and other legal considerations, and more conventional, private and privileged rights of access. The digital medium and standards in use combine to capture and communicate all of the above; we have an obligation to be open and explicit about these methods, through the use of open standards, documentation, training, raising awareness and ensuring sustainability of our digital practices and

communities—especially the engagement of local or indigenous communities and cultures in all of these processes.

Digital humanities scholarship brings together interest in historical and literary disciplines with its own research methods and concerns, and is itself as important as traditional epigraphic disciplines—indeed is a more accessible discipline, embodying respect for a wider audience, sustainability of resources, transparency of data and methodology, and social justice. There is no conflict within or between these concerns and 'traditional' scholarship, for they all serve the same ends of academic pursuit: furtherance and communication of knowledge and the betterment of society. These considerations are not new, this chapter is not inventing any wheels. Digital methods and approaches merely enable (and therefore oblige) us to be explicit in all features of our scholarly editing work, making that work more accessible, inclusive, sustainable, ethical, and in all senses more scholarly.

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