

Introduction

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Prelude

Situated within the broader field of Digital Humanities, Digital Classics is concerned with the application of computational methods and theories to the study of the Greco-Roman and wider ancient world. Over the last decade or so, a decentralised and international community of researchers in this area has emerged, centred around the *Digital Classicist*. In addition to curating a wiki, and conversations over discussion lists in two languages, this community has been organising several seminar series aimed at providing a venue for discussion of work in progress. Indeed, some of the chapters in this collection arose from papers given at the Digital Classicist seminars in Berlin or London, although the majority were conceived or commissioned afresh for this publication. The scholarly community in the context of which this volume is coming into being, however, has been formed around both sets of seminars (plus those in Leipzig, Tufts and Göttingen), a series of conference panels, and previous volumes arising from them that were published by the *Digital Medievalist* journal, by Ashgate Press, and as a supplement to the *Bulletin of the Institute of Classical Studies* respectively.¹

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All of the chapters in this volume are significant scholarly contributions in their own right, presenting research questions in Classics or Digital Humanities (or in many cases both). They are all also examples of work within one of the most important area of academia today: scholarly outputs that address an audience other than the colleagues who work down the corridor (or at the other end of a VOIP call), be they our students, academics in very different fields from our own, commercial partners, or the broader public. As Gregory Crane has argued, collaboration, particularly with better-funded and more high-tech disciplines, is essential to Digital Humanities and even more so to Classics.² Such collaboration and sharing of values and outputs requires us to consider research outputs to be more than simply peer-reviewed papers—or rather, for us to recognise as peers and readers a much wider range of interests than we might traditionally have done.

As scholars, we have always recognised the need to do better at communicating with less-specialist audiences: those who do not necessarily share our educational privilege and cultural capital; those who may not understand our jargon or swim in the same sea of acronyms and camelCase shorthand. It is our duty, as academics and public servants, to communicate the value and the results of our research to the public, as well as to scholars and practitioners to whom it is already obvious *why* we would study the impact of Linked Open Data on the collection of onomastic data on people two thousand years dead. Perhaps even more importantly, we have not only the responsibility, but the existential need, to communicate the relevance of our place in the academy, and the very academy in the wider world, to an audience beyond the comforting echo chamber. The digital tools, methods and approaches that we implement and develop in our field offer new potential for communicating in new ways, through new media, and to new audiences. We have tools for asking new or more sophisticated questions of our ancient sources, and methods for studying texts, objects and data at scales previously impossible; similarly, information and communication technologies allow us to tell stories in ways, and accessible to people, that we have heretofore neglected.

Especially in the current climate of challenges to academic budgets and resources, the importance of engaging with audiences outside of our own discipline is clear, both in terms of academic survival and for meeting the criteria of academic role descriptions, promotion review panels or institutional assessments: criteria which include ‘impact,’ engagement, teaching and environment, as well as conventional research output. The international perspectives on these issues are especially valuable in an increasingly connected, but still institutionally and administratively diverse, world.

This volume is accordingly offered to an audience that, yes, includes scholars in the various fields of Classics, Archaeology and History covered by the chapters (from epigraphy, papyrology and manuscripts, via Greek language, linguistics and literature, to imaging and modelling of artefacts and architecture);

and, indeed, includes academics in digital humanities, library and information science, informatics, and pedagogy whose domains of expertise are relevant to the technologies and methods further applied and discussed in the individual chapters. But we also hope that the pedagogical discussions will be accessible to students, as well as teachers; that the accounts of collaboration and cross-sector sharing will be of interest to our non-academic partners; and that the arguments around public engagement, reception, crowdsourcing and citizen science speak to those contributing or interested citizens, as well as the scientists who run the projects attempting to engage them.

We hope this book as a whole will be of value beyond the scholarly interest in individual chapters. For example, much of the discussion herein will be of practical and specific value to educators who might be looking for ideas to engage their students or the wider public in looking at, working with or contributing to digital resources for antiquity. There is also value to participants in large and highly collaborative projects that involve humanists and scientists or commercial developers, in papers that share insights into issues and pitfalls involved in crossing different disciplines, and ways in which we need to interact and negotiate between research cultures. The public engagement discussion inevitably also intersects with important conversations around the importance of the Humanities and the contribution of Digital Humanities in communicating this value both to the academy and to the community at large.

This book is divided into three sections.

Section 1: Teaching will discuss the contribution of digital humanities to pedagogy, teaching and learning in the classics, archaeology or digital humanities—including the creation of classroom or online materials for the study of languages, texts, or topics in ancient history and archaeology, and the teaching of digital humanities techniques such as text encoding and linguistic analysis. All of the chapters in this section acknowledge that the division between digital methods for teaching, and research into digital tools is a porous one, and that digital approaches are helping to break down the divide between the researcher and the student.

Section 2: Knowledge Exchange will focus on digital research projects or activities that bring together scholars or practitioners from outside of the traditional disciplines classicists and digital humanists are used to working with, or from outside of academia altogether. Collaborations with the medical sciences, with library and cultural heritage institutions, and with media and gaming industries all benefit both parties, with expertise and new insights into research questions moving in both directions.

Section 3: Public Engagement will discuss issues such as crowdsourcing or ‘citizen science,’ which serve not only to harvest the expertise or enthusiasm of non-specialists on a large scale, but arguably even more profitably engages the crowd with scholarly materials in a way that they might never have considered before. We also address publications of classical material that are targeted at

a non-academic audience: popular books, documentaries, games, open access publications that are available far beyond the university library. Considering that the research that enables the production of such scholarly materials is often made possible thanks to public funding, we believe that more attention could profitably be paid to reflecting on the extent to which the wider public is aware of and benefits from—and even is able to contribute to—such materials.

Teaching

One recurring characteristic of the application of digital technologies to teaching and learning is the disruption of barriers and requirements to accessing knowledge that are set by more traditional curricula. What emerges from several chapters in this and in the Knowledge Exchange section, is a willingness to open up resources and communicate knowledge to all “regardless of native language, background and level of expertise.”³ With regards to teaching, this means imparting a subject or set of skills to an audience with no prior familiarity with it, such as teaching ancient Greek to absolute beginners or digital editing of texts by means of structured markup to students and scholars with little or no computing background.

The image of students that emerges from several chapters in this section is that of learners and, at the same time, content producers. Interestingly the Ancient Greek Treebank, which is central in Chapter V, was created with an essential contribution by students in classrooms. This is made possible also by the existence of tools such as SoSOL or Perseids, discussed in Chapter IX, that engage students, in addition to a more general public, in the creation and improvement of digital resources. From this perspective, digital scholarly editing becomes an invaluable pedagogical tool for learning to encode texts by means of markup, and also empowers students to make an original research contribution while learning.

Moreover, the use of digital technologies in teaching prompts a reflection on the added value of using these technologies, and a more general reflection on how there is no need to treat the acquisition of digital skills as an extraordinary topic, needing to be taught separately from non-digital subjects such as epigraphy or ancient languages. By the same token, the same digital research outcomes and methods should not be considered as separate from the pedagogical needs to which they are so well suited to contribute.

In Chapter I, Dee et al. consider the theory and practice of a ‘learning by doing’ approach to the encoding of texts by means of XML markup following the Text Encoding Initiative (TEI) guidelines. This chapter reviews the theory behind digital pedagogy and contains a useful review of several resources, informed by different pedagogical models, for learning. The authors also give an example of the issues that are raised by the creation of truly multilingual

user interfaces that would allow for moving outside the echo chamber of Euro-American academia. Such issues in the visual display of right-to-left scripts emerged as a scholar was working on a Farsi translation of an ancient Greek text within the Perseids platform.

The focus on the creation of open resources for teaching is even more central in Chapter II, in which Mahony considers the creation and availability of Open Education Resources (OERs) for the teaching of Classics, with a specific focus on the situation in the UK. His discussion of specific issues related to OERs, such as the choice of distribution formats or the importance of repositories where these resources can be openly shared, is interwoven with a review of past projects aimed at increasing awareness around OERs and their reuse. The author also presents the results of a search for OERs for the teaching of Classics across UK repositories. The picture that emerges is not particularly encouraging and highlights the need for the practice of creating, sharing and re-using such resources to become embedded in teaching habits at every level, starting with the training of new teachers.

Chapter III focusses on the experience of teaching EpiDoc (TEI markup for epigraphy and papyrology) to an audience of classicists and historians over the past decade. The first part of the chapter is dedicated to describing the history of these training events, their structure and the content that is taught at (or omitted from) them. Based on the feedback received by workshop participants, Stoyanova and Bodard discuss some new models that could be integrated into the teaching of EpiDoc in the future. In the second part of the chapter the authors reflect on the current practice of teaching epigraphy and digital epigraphy. They argue for a teaching model where they are both taught in parallel as there are no substantial differences to justify this separation. It is also worth emphasising how the EpiDoc workshops have attracted students and researchers from audiences outside the echo chamber of Greek and Latin epigraphy, thus contributing to create bridges towards other epigraphies (e.g. Mayan, Egyptian, South-East Asian).

In Chapter IV, Rydberg-Cox describes his open tutorial for absolute beginners of Ancient Greek. The patterns in usage of this tutorial, which was originally aimed at supporting teaching in a classroom, reveal how it engaged users far beyond the boundaries of traditional academic environments. After presenting briefly the main functionalities of this tutorial, the author describes the main design choices he made in creating the tutorial and how they contribute to make this a resource that proved useful for those who want to learn some Ancient Greek wholly online and entirely on their own.

This section is concluded by Chapter V, in which Mambrini examines the implications for teaching of using Treebanking in a classroom setting. Treebanks are a specific kind of linguistic annotations where the syntactic structure of sentences is represented (and visualised) as a tree and is expressed by using a dedicated formalism. Taking as an example the construction of the syntactic tree of an eleven word sentence drawn from Sophocles' *Women of Trachis*, the

author shows the wide range of aspects that need to be considered in the process. These aspects range from the literary context of the sentence to its grammar and syntax. The existence of several plausible ways of constructing the syntactic tree of the same sentence constitutes in itself a powerful pedagogical method to let students reflect on the arguments that can be adduced *pro* and *contra* each alternative.

It is worth noting that some of the chapters in this section challenge the thematic organisation of this volume into three distinct sections. Chapter III partly overlaps with the topics covered in the Knowledge Exchange section; in fact, EpiDoc workshops are also about training a generation of scholars to be better at collaborating with colleagues in other disciplines, as they acquire a 'structured way of thinking about and producing data.' Chapter IV could as well have been situated in the Public Engagement section as it shows how a digital tutorial, if properly designed, can engage a wider public well beyond the limits of the classroom for which it was originally created.

Knowledge Exchange

The three chapters in this section consider different aspects of Knowledge Exchange (KE), the bringing together of scholars or practitioners from outside of the traditional disciplines classicists and digital humanists work with—often from beyond academia altogether. The first aspect is the challenges and difficulties of making KE work within interdisciplinary research projects. The second is the adoption and application of specific methodologies to disciplinary areas very different from those where they originated. The third is the extent to which some technologies by their own nature are more effective than others in creating a number of potential collaborations with scholars and stakeholders outside the echo chamber.

In Chapter VI, Tarte reflects on her experience of applying image processing techniques to research fields as diverse as papyrology and trauma surgery. Among the strategies experimented with by the author that have proven useful to foster truly collaborative research there is the discussion of what she calls 'T-words': words that ought to *Trigger a Terminology Twitch*. T-words are words like 'feature' or 'model' that have the characteristic of carrying with them a rich and implicit framework of field-specific assumptions. Therefore, discussing and clarifying within a team the meanings of similar words in different fields can facilitate collaboration and exchange by elucidating these implicit frameworks. Another lesson offered by this chapter is that awareness about the differences between disciplines with regards to their respective modes of collaboration, communication and knowledge production is key to facilitate the fruitful collaboration among scholars with very different backgrounds. Finally, the author argues that interdisciplinary research requires, above all,

trust between specialists, which can only be built if participants are able to successfully communicate their expert knowledge to non-experts.

Chapter VII presents a highly collaborative research project whose methodology was informed by methods developed in very distant fields, and where the interdisciplinary nature of the team was key to the project's success. In this chapter Campagnolo et al. describe the creation of an open dataset of multispectral images of deteriorated parchment documents. This dataset can then be used to evaluate different methods and algorithms for the recovery of writing from multispectral images of a manuscript. The idea around which this project evolves is taken from medical physics where *phantom tests* are digital models or material objects that allow for testing a new experimental technique in order to assess its potential usefulness. On this model, this image dataset allows for testing how effective image processing techniques are in recovering writing from documents that have undergone various forms of physical deterioration such as mould, fire, smoke etc. Collaboration between experts in book conservation, image processing and colour science was essential in the various phases of the project, from selecting which damage categories should be reproduced to acquiring the parchment materials to setting up the system for image acquisition.

Chapter VIII, which concludes the section, sees a slight change in focus as Vitale does not reflect on aspects of KE emerging from already concluded projects but rather speculates about the avenues for KE that open up as the result of a technological choice. Specifically, she discusses the implications of devising an ontology (in the computer science usage) to document 3D visualisations in cultural heritage. The problem at stake is one of essential importance for the acceptance of 3D reconstructions in an academic context: how can the interpretative choices entailed in creating a virtual model of a historical artefact be documented and made explicit and transparent? Vitale answers this question with the proposal of SCOTCH, the Semantic Collaborative Ontology for Three-dimensional visualisation of Cultural Heritage. A 3D visualisation, once documented by means of this ontology, ceases to be a merely visual artefact to become a small knowledge repository in its own right. In fact, by following a Linked Open Data (LOD) approach Vitale envisages 3D visualisations documented by means of SCOTCH to be linked to other relevant sources of information available online. Although a potential issue with this solution is arguably the time needed to document the visualisation process by means of RDF statements, the advantages in terms of knowledge sharing and exchange are numerous. Indeed, documented 3D objects can become useful resources for several sectors outside academia: museums and archives can build upon them to create exhibitions, be they physical or virtual; curators and restorers could use the 3D models to monitor changes to and degradation of artefacts and historical buildings; finally, annotated scans of archaeological excavation sites could be shared with urban planners of local municipalities who could use them when planning interventions on the territory.

Public Engagement

The chapters in this section reflect on how resources produced within academia can be made more easily accessible to and usable by the more general public, and how these audiences of citizen scientists—namely interested individuals outside of traditional academic environments—can be successfully involved in the creation of high quality content and resources. While the results of research projects tend to be characterised by high quality standards, academics often fail (or sometimes entirely neglect) to communicate the value of their research outputs to those who live and work outside of the academic echo chamber. Since academic research is largely funded by public money, it is arguably incumbent upon us to find ways to engage the public with our findings—even privately funded academics and projects, or those who do not believe public funding instils a duty of openness, need to engage with the reception of humanities among the wider population, at least if we care about the survival of our disciplines.

Moreover, if we succeed in developing strategies to engage the public in the production of new content, so-called ‘crowdsourcing,’ enterprises will be possible that would otherwise not have been conceivable.

In Chapter IX, Almas and Beaulieu reflect on the wider implications for scholarship of developing *Perseids*, a collaborative platform that allows virtually anyone to edit, translate and annotate ancient documents, while maintaining the quality standards of classical scholarship. The motivation for their work lies in the fact that the sheer amount of unedited and untranslated texts now available online renders impractical the traditional single-scholar approach. *Perseids* leads to a democratisation in the production of scholarship as the variety of tools it offers and the range of tasks it supports ensures that participants from different fields and at every level of expertise. At the same time, the scholarly integrity of all contributions made through *Perseids* is maintained, as they are vetted by an editorial board, constituting a form of peer-review. The provenance of each individual contribution is tracked, making it possible to attribute intellectual responsibility (key to scholarly method) and credit contributors (important to individual careers).

Chapter X contains an account of the challenges faced by the Ancient Lives project, whose main goal was to ‘let the world assist in transcribing the seemingly countless papyrus fragments.’⁴ The task performed by the participants was at the same time intriguing and designed with simplicity: using a virtual keyboard with Greek characters, users attempt to transcribe the characters they see on the ancient papyrus. The main technical challenge, which Brusuelas discusses in depth in this chapter, arose from the decision to allow multiple users to annotate the same document: how do you make sense of the huge amount of sometimes conflicting and faulty data generated in this way? This problem was solved by borrowing a method for the alignment of protein and DNA sequences from bioinformatics and adapting it to the alignment

of characters from multiple transcriptions. This new algorithm allowed the project team to resolve competing transcriptions of the same individual character through recording consensus, and made it possible to create a corpus of transcribed—yet unedited—papyri out of more than nine million single-character classifications.

Finally, in Chapter XI, Orlandi presents the Europeana Network of Ancient Greek and Latin Epigraphy (EAGLE) project with a particular focus on describing the strategies enacted to engage the public with ancient inscriptions. While the primary aim of EAGLE was to create an epigraphic resource for academics, considerable attention was also paid to finding ways to make this resource more accessible to the general public. To this end, two mobile applications were developed as part of the project. The first, the EAGLE mobile application, provides an intuitive way of accessing the contents of the database and targets tourists and museum visitors in particular: while using sophisticated image recognition technology behind the scenes, this application allows users to search for epigraphic information by uploading a picture of an inscription taken with their smartphone. The second, a storytelling application, enables the creation of user-generated stories around inscriptions by facilitating the integration of multimedia resources that can be found online (e.g. pictures of inscriptions from Flickr or articles from Wikipedia, in addition to the contents in the EAGLE database). The simple yet powerful idea behind this application is that such stories, with their vivid multimedia narratives, can be an effective way to communicate and promote the fascinating richness of this aspect of European cultural heritage.

Coda

There are of course recurring themes between the three sections, and as observed above there are chapters that could quite reasonably have been included in more than one section, particularly between public engagement and teaching. The most striking theme that all chapters share is a recognition of the importance of openness: not only Open Access as a means to reach the widest and most diverse audience possible (as exemplified also by this volume), and not only Open Data as a means to make the research as transparent and replicable as possible, but ideally also the use of Open Standards for interoperability, and preferably Open Licensing of content and use of Open Source Software to encourage the direct engagement with, re-use of, and active improvement of both the tools and the outcome of our research. This openness, core to much of digital scholarship, is an important element of the agendas of most of the projects described in this volume.

In common, the chapters in the three sections discuss work in digital classics that addresses and even targets audiences who are not in the first instance our academic peers. These include our students, interdisciplinary collaborators,

practitioners of cognate methods in industry or heritage sectors, and the citizen public at large. The importance of looking outward is manifold, and the particular focus in this volume on digital research and methods within classical and ancient historical scholarship is significant.

As scholars, whether academics and educators, heritage professionals, or others who engage with the ancient world, we believe that our research has value to humanity, not just to those like ourselves who are privileged to study it so closely. In fact in the digital humanities, which often considers digital media and publication methods as indivisible from the research tools and approaches we use to create and study data, is uniquely positioned to reach a wider audience by making material available online, via open fora, interdisciplinary venues and social media. Digital research is also about actively widening the questions we ask of our sources, the approaches we take and even the data we can apply to our scholarly activity; it is also possible (and as the contributions to this volume show, often achievable) to leverage this flexibility in and evolution of scholarship to broaden also the questions and the fields of interest in our discipline, addressing the classics from the perspectives of a wider constituency of potential readers.

Through all of these means we can, and we should, take the opportunity to communicate ancient world research to those outside of the academy. Classics is often thought to be niche, *recherché*, practically irrelevant, even elitist; if anyone is going to prove those assumptions wrong, surely it is digital classicists?

At the same time, we should also be communicating the importance and relevance of digital humanities practice, which includes a great degree of self-reflection and attention to historical developments, outside of the discipline itself. Making it clear that digital classics is at the hub of many collaborations, innovative teaching and research projects, and instrumental in bringing scientists and citizens to contribute to the study of antiquity, should be a great demonstration of this relevance.

Notes

¹ Bodard & Mahony 2008, 2010; Dunn & Mahony 2013.

² E.g. Crane 2004: 47.

³ Almas & Beaulieu 2016 (This volume, Chapter IX, p. 171)

⁴ Brusuelas 2016 (This volume, Chapter X, p. 188)

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