WISHES GRANTED: The ANS and the NEH

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Introduction
Since its inception in 1858, the ANS has been exceedingly fortunate to have had the continued support of its membership and private benefactors, who have ensured the Society’s impressive longevity, especially when compared to similar types of special interest institutions created in the nineteenth century, many of which did not survive the Great Depression of the 1930s. Unlike its sister coin cabinets in Europe, such as those at the British Museum in London, the Münzkabinett der Staatlichen Museen in Berlin, and the Bibliothèque nationale de France in Paris, which are wholly supported by public funds, the ANS has been sustained almost entirely by private funding for the last 159 years. More recently, however, the staff at the ANS have sought grants from public funding bodies in order to underwrite the costs of large-scale digital projects (including the creation of several jobs), which otherwise would be beyond the means of our normally tight budget. In their grant-writing, the staff have been quite successful, particularly with applications to the National Endowment of the Humanities (NEH), a federal funding organization that was established over 50 years ago, during the administration of President Lyndon Johnson, to support worthy endeavors in the humanities in the US (see www.neh.gov). Within the last three years, the NEH has awarded the ANS over $600,000 for various projects, each of which is highlighted in the following pages. Given how critical the NEH has become for supporting these ANS projects, it is worth taking a moment first to discuss how these public funds are awarded, and the nationwide, not to mention worldwide, impact these dollars have.

Grant Competition
The NEH offers funding in 41 different categories, which are listed on its website (www.neh.gov/grants). We have identified several of these categories as a potential fit for the digital/digitization projects we have wanted to pursue, notably the NEH-Mellon Fellowship for Digital Publication and Humanities Collections and Reference Resources (HCRR) grant. The application requirements for the grants is fairly demanding, requiring in the case of the HCRR bid, a package containing 1) a one-page abstract of the project; 2) a 15-page narrative describing the project’s significance, history, methodology and standards, dissemination, workplan, and staff; 3) project deliverables; 4) list of participants; 5) budget; and 6) supporting letters. Writing the applications takes several weeks of near constant work, especially honing the narrative to be as succinct and compelling as possible. Most grant-writing at the ANS is a collaborative effort between two or more staff members, who generally seek outside comments and criticisms from colleagues elsewhere to help fine-tune the application.

Once the application is submitted to the NEH, it generally takes 6–8 months before the results of the grant competition are announced, a length of time necessitated by the considerable number of applications the NEH receives in each funding category, but also by the rigorous, multi-tiered selection process to which each application is subjected. This includes several ever-narrowing rounds of review by academic peers, who judge the applications on their merits, feasibility, and the perceived significance of the project for the humanities at large. The final round of selection is conducted by NEH staff members, who apply still more judging criteria to the applications, and once they have made their selection, decide what proportion of the asked-for funds to award.
This highly selective, rigorous, and competitive process means that only a comparatively few of the grant applications are ultimately successful. The fact that the ANS has been awarded several significant NEH grants in recent years speaks not only to the grant-writing abilities of the staff, but also to the value that academic and humanities professionals at large see in what it is we do.

**Impact of NEH Funding at the ANS**

The ANS has been based in Manhattan in New York City since its foundation, although its members can be found currently in 48 states (plus the District of Columbia) and 51 countries around the globe. Interest in numismatics is clearly universal, and through the decades we have addressed our members’ interests primarily through events in New York City, occasional events elsewhere, and an extensive array of print publications. Given the logistics and expense of travel, few of our members from outside of the tri-state area are able to visit our headquarters and use our resources first hand. In order to make our resources widely available, we have embraced the potential offered by the World Wide Web to reach the largest possible audiences. The ANS’s commitment to digitization, in fact, began decades ago.

Already in the late 1970s, when punch card mainframe computers the size of moving vans were the norm, and “personal computers” with a tiny fraction of the computing power of today’s smart phones cost as much as a car, the ANS was making forays into digital technology. Under the direction of ANS President William Metcalf and Michael Bates, began a program to create a new digital database of its numismatic holdings. The ANS launched its first computer (figs. 1–2), much of the Society’s efforts were directed towards creating new digital tools and resources for collectors, scholars, and the generally curious. Over the course of the last decade especially we have continued to improve our online presence with continual updates to our basic online resources, MANTIS (collections), DONUM (library), and ARCHER (archives), and have also pushed hard to create a new suite of innovative, interlinked research tools that focus more narrowly on certain parts of our large numismatic collection, such as Roman Imperial Coinage (OCRE). It is in part to fund the development of these new research tools that we have applied to the NEH.

At the same time, however, equally energetic work has gone into digitizing our entire print publication backlog; another endeavor the NEH has been funding. Our goal ultimately, is to have an extensive array of interlinked websites, any one of which can serve as a portal to the resources we make available. If, for example, a reader happens to be paging through the digital version of E. T. Newell’s 1938 ANS publication, Coinage of the Eastern Seleucid Mints, and taps on the highlighted link to a coin in the ANS collection, s/he will be taken to the MANTIS record of the coin, which then provides additional links to Seleucid Coins Online, hoard information, maps, and biographical information on Seleucid rulers, and E. T. Newell himself.

In the meantime, we are getting ever closer to this goal largely due to funding from the NEH, which has already provided the means to hire several full time assistants to work on the cataloguing and photog- 

rathy work that lies behind our online tools. The NEH-funded tools that have already been launched, notably OCRE (numismatics.org/ocre), have had a significant impact well beyond New York City. In a Pocket Change blog post, ANS Executive Director, Ute Wartenberg used Google Analytics to illustrate the great extent to which OCRE is being used in the heartland of the US. Of all places, those in central Minnesota appear to be some of the heaviest users of the site.

In sum, there is little question that without the support of the NEH the ANS would not be as effective as it is today in offering those interested in numismatics the means to explore the subject to the extent they can do so now.
Mission Accomplished: Online Coinage of the Roman Empire (OCRE)

Online Coins of the Roman Empire (OCRE) is a major digital initiative begun in 2011 as a collaborative project between the American Numismatic Society and the Institute for the Study of the Ancient World (ISAW) at New York University. Its completion has been funded by a major $300,000 grant provided by the National Endowment for the Humanities (NEH) in May 2013.

The original goal was to make available a digital corpus of all published Roman Imperial coin types, spanning the reigns of Augustus (30 BCE–14 CE) to Zeno (474–496 CE), according to the recorded Imperial coin types as defined in the 10-volume reference corpus Roman Imperial Coinage. At the same time, the project aimed at expanding toward external contributors with a potential for linking any collection-based online catalog.

The OCRE project is now complete, three years after the NEH grant was approved. The total number of recorded Imperial types reaches 42,740, a figure that incorporates a certain number of sub-types as well (fig. 1). Several key domestic and international institutions have joined the ANS in allowing users to access their own collections through the relevant types displayed by OCRE: to date, the British Museum, the Münzkabinett of the State Museum of Berlin, the Fitzwilliam Museum, the Harvard Art Museums, the Museu de Prehistòria de Valencia, the Münzkabinett of the Kunst Historisches Museum in Vienna, and the University of Virginia Art Museum are among the main contributors, having provided thousands of their coins alongside those in the ANS collection. As a result, the number of individual coin types records available through OCRE now totals more than 106,000. That number continues to grow as new institutions join the OCRE initiative or existing partners make more of their coins available.

Many of these records are accompanied by photographs, a tremendous accomplishment since it has involved photographing substantial portions of the collections, including about 30,000 additional Roman coins at the ANS alone over the course of three years.

OCRE serves as both a searchable catalog and a tool with which to conduct quantitative and typological analyses of numismatic data, encouraging collectors and scholars alike to approach Roman coinage from a variety of perspectives. Data in OCRE can be extracted through various search methods to produce innovative results. Users can narrow their samples by selecting specific target characteristics, including but not limited to mints, denominations, authorities, date ranges, monuments, and deities. From a data analysis perspective, it is already possible to work out the chronological distribution of images, monuments, deities, or concepts throughout over 130 relevant minting authorities, mints, or denominations. However, new analytics will allow even easier and more powerful tools for conducting numerical and quantitative analysis.

We will soon be unveiling instructional videos on the OCRE website to assist browsers in using these features. Whenever they are available, each coin type is appended with multiple examples from important numismatic collections, comprised of both metrological information and photographs of the obverse and reverse of each coin when pictured, as well as specific characteristics and provenance when known (figs. 2–3). OCRE is built on Numishare, an open source suite of applications for managing and publishing numismatic collections on the web. The underlying data model of the collection is the Numismatic Description Standard (NUDS), a linked and data-influenced XML schema for coins. NUDS enables the linking of coin types in OCRE to numismatic concepts represented on Nomisma.org as well as linking to web resources that describe physical specimens, such as those in the ANS.

The use of linked data to link each example to the object record of its collaborative institution allows these images to make the types more accessible. This will allow users...
to conduct die studies when the available samples grow as more collections join the project. The use of linked data also facilitates connections between OCRe and other digital collaborative projects at the ANS, such as Coinage of the Roman Republic Online (CRRO) and Coin Hoards of the Roman Republic (CHRR), as well as those of other institutions, as displayed on this map (fig. 4).

At the same time, translations in about 15 languages have been made available, with new languages currently being implemented, including Hungarian, Ukrainian, Danish and Turkish. Finnish and Hebrew will be added soon (fig. 5). By selecting a preferred language from one of the pull-down tabs, all of the text on the OCRe site automatically switches over to that language; this feature greatly expands the usability of the OCRe site to a considerably larger audience.

Web traffic has steadily increased over the lifetime of OCRe, with a number of monthly sessions in the 1,500–2,000 range at the end of 2013 to a current average of 7,000–8,000 (fig. 6). About half of the 12,000 users-to-date in 2017 are new, with an average of seven pages viewed per session in seven minutes. These statistics indicate that OCRe is hitting the mark in terms offering unprecedented research services to an every expanding body of users.

A new interface to aid in the identification of Roman imperial coins by non-specialists (archaeologists and collectors alike) has been made recently available. We hope that this will be especially useful for badly worn coins discovered in archaeological excavation. The interface, called “Identify a Coin,” allows users to identify coins based on visibly identifiable attributes (figs. 7–8). Selection of specific criteria leads the user into a subset of matches for further comparison (aided by the great number of images associated with coin types provided by Nomisma.org partner institutions). For example, a user of this interface can select the metal along with any recognizable characters on either the obverse or reverse legend, with wildcards (“*” characters) designating gaps in legibility. Users can also select from a nearly complete list of Imperial portraits as potential matches. The portraits are listed chronologically, first by dynasty, and then by personage within the dynasty (including empresses and children). In many cases, portrait images are available in gold, silver, and bronze, as well as worn examples that one may encounter with stray finds or excavation. The selection of a material will automatically change the metadata and portraits, when available, in a striking fashion where it lacks portrait coins among its collection of Roman Imperial Coins. The following table (table 1) summarizes those that are missing, which are mostly very rare coins because of the short reigns of the rulers or types that were produced in very limited numbers. It goes without saying that the ANS would be immensely grateful to any donors willing to fill in these gaps.

OCRe is by now a game-changer for anyone with an interest in Roman Imperial coinage. It has created a true community of users, as attested by the numerous correspondence and requests for changes we receive every day from all over the U.S. and Europe. In that respect, the ANS is grateful to the collectors and scholars alike who keep noticing and signaling mistakes and allow for a gradual and steady improvement of the dataset made available through OCRe and its contributing collections.
The Hellenistic Royal Coinage Project

With the success of the ANS’s digital initiatives on Roman coinages, including those focused on Republican coinage (CRRO and CHRR) and Imperial coinage (OCRE), we began to turn our attention a few years ago to the Greek cabinet, devising new digital projects that would highlight the ANS’s impressive collection of Hellenistic coinages particularly. In 2015, we launched PELLA1 a site that has as its current focus the coinages in the name of Alexander the Great (fig. 1). The growth of PELLA to include now nearly 19,000 coins of 4,070 types has been greatly facilitated not just by a host of interns and volunteers at the ANS, but by our colleagues overseas in England, France, and Germany especially. Innovative new ways to use the data now available on PELLA were also the subject of a recent conference hosted at New College, University of Oxford.2 With PELLA successfully underway, it was time to look to other Hellenistic coinages, and to search for funding to support our efforts.

In April, the National Endowment for the Humanities (NEH) announced that it had awarded the ANS a substantial grant of $262,000 to fund the web-based Hellenistic Royal Coinages (HRC) project. Under the direction of Curator Peter van Alfen and Data Scientist Ethan Gruber, this three-year project (Phase 1, planned for 2017–2020) promises to radically transform the ability of students, scholars, or collectors to identify and research Hellenistic royal coinages, and to incorporate this numismatic material into broad analyses of political, economic, and social history. The funds from this grant are being used to hire assistants to aid in the extensive photography, cataloguing, and typology work that lie at the heart of the project, which officially began on May 1.

The Background: Hellenistic Royal Coinages

Coins are an entirely unique type of evidence for the ancient world. No other class of artifact embodies the same mixture of political, social, artistic and economic concerns. The product of politicized decision making, ancient coins entered the world through state payments, but then became instruments of economic exchange more broadly, sometimes with serious and farreaching social consequences. The numbers that survive today tell us about the size of economies at a given moment and in particular places; their images and inscriptions tell us about the selfperceptions of rulers or entire societies; their findspots help us map the extent of political powers and economic influence. Ancient coins are a great deal more than just dead currency.

Within a few centuries of their invention in the seventh century BCE, coins became preferred monetary instruments, but their use was mostly limited to the Greek world. This was to change dramatically following the conquest of the Persian Empire by Alexander the Great at the end of the fourth century BCE. A sudden and massive surge in coin production began using the ca. 4,700 tons of captured Persian gold and silver in areas of the Near East that had previously not seen coinage, first under Alexander himself and later under his successors. The monetary consequences of this flood of new coinage and monetary metal were unparalleled, not just in the east, but in the Greek homelands as well, where many citystates stopped producing their own coins or began to produce imitations of Alexander’s. After Alexander’s death in 323 BCE, his successors, including Seleucus, Ptolemy, and Antigonus began to define their individual kingdoms and soon initiated a new royal class of coinage that stood well apart from the traditional citystate issues (figs. 2–4). Taking cues from Alexander’s coins, these royal coinages were distinctive in a number of ways, not least for the ruler portraits that appeared on coins for the first time in history. Today, these remarkable coins bear some of the most distinctive images to survive from the ancient world, and form a standard part of many museum collections.

In a period from which few contemporary historical accounts survive, royal Hellenistic coinages have the potential to provide critical insights into the rise and fall of powerful dynasties in the Mediterranean and Near East between ca. 323 and 30 BCE. They can inform us about large-scale conflicts, the movement of vast amounts of wealth across regions, as well as the transfer of wealth between social classes. But coinage can only be set to these tasks if it can be assembled in

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1. numismatics.org/pella.
large quantities. With the arrival of webbased tools for such assemblage, we are presented with the opportunity to bring together large amounts of evidence distributed across multiple collections, and thus to transform our understanding of an entire period of history.

**Hellenistic Numismatic Evidence: Problems and Solutions**

Hundreds of millions of royal coins were originally produced, hundreds of thousands exist today, and tens of thousands reside in single collections like that of the ANS, which alone holds 25,740 examples. Major collections are held in museums across the United States, as well as in the large national collections in London, Paris, Berlin, Vienna, and elsewhere. Like the ANS with its online catalogue MANTIS, many of these institutions provide webased access to many of the royal coins in their collections. But despite this wealth of numismatic evidence available for research, the study of royal coinage is severely hampered by several problems:

1) **Typologies and cataloguing.** The coinages of Alexander the Great, the Seleucid kings of Syria, and the Ptolemaic kings of Egypt have been well studied and typologies have been published in print, but those for Lycaon of Thrace, the Antigonids of Macedonia, the Attalids of Pergamum, and the Bactrian kings of Central Asia still have not been. Of the existing typological studies, some are now long out of print. While the more recent studies, in print or not, are prohibitively expensive thus restricting access for many researchers, another stumbling block is that the relevant coinage pages and interlinked access to critical archival resources remain highly relevant. Until recently access to these documents had been limited to visitors to the ANS. At the same time, files at the ANS containing notes, correspondence and photographs concerning hundreds of hoards of Hellenistic coins remain inaccessible to most researchers. These files form the basis for the descriptions of hoards found in the publications *Inventory of Greek Coin Hoards* (1973) and *Coin Hoards I–X* (1975–2010), detailing the findspots both for types of coins and for individual specimens. Open access to these archival resources would give researchers a better understanding of the circulation patterns of individual types of coins, and the provenance history of individual specimens.

Hellenistic Royal Coinage aims to provide a solution to all of these problems. Through the digitization of the ANS’s unrivalled collection of this material, in parallel with the conversion of existing print works to a Linked Open Data resource, it will offer a suite of open access online tools that will provide benchmark typologies for royal coinages beginning with those of Alexander the Great, the Seleucids, and the Ptolemies. In addition to providing a linkable and searchable repository of monograms and symbols, extensive information on findspots (hoards), and will provide full and interlinked access to critical archival resources held at the ANS.

2) **Monograms and symbols.** Hellenistic royal coins are remarkably “chatty”; the reverses of the coins typically carry not just the name of the king, but also numerous additional monograms and symbols (fig. 5). These are not well understood. Some we know indicate the place (the “mint”) where the coin was produced; others may indicate additional administrative information, such as the subauthority (a “magistrate”) directly responsible for the coinage. These marks are often our sole clue for deducing where and when a coin was struck. To date there has been no attempt to collate the thousands of marks known from the individual series of royal coins into a universal, searchable repository. Such a tool would immediately allow connections to be made between, for example, different series of Seleucid coins, but also between Seleucid and other nonSeleucid coinages. This would further allow deductions about attributions and dating to be verified or corrected, and would give insight into the extent to which the marks were reused across time and space, which would help to resolve the purpose of some marks.

3) **Access to provenance information, findspots information and archival resources.** One of the most important and prolific scholars of royal coinage, Edward T. Newell (d. 1941) left to the ANS dozens of notebooks and unpublished manuscripts on royal coinages and hoards that remain highly relevant. Until recently access to these documents had been limited to visitors to the ANS. At the same time, files at the ANS containing notes, correspondence and photographs concerning hundreds of hoards of Hellenistic coins remain inaccessible to most researchers. These files form the basis for the descriptions of hoards found in the publications *Inventory of Greek Coin Hoards* (1973) and *Coin Hoards I–X* (1975–2010), detailing the findspots both for types of coins and for individual specimens. Open access to these archival resources would give researchers a better understanding of the circulation patterns of individual types of coins, and the provenance history of individual specimens.

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**Overview of HRC**

HRC will be built around seven interlinked components, employing the principles of Linked Open Data, already successfully deployed in a number of other ANS projects (including the NEH funded OCRE project). These include three standalone online tools each of which is devoted to the coinage of a single royal dynasty. These are: (1) PELLA, with a focus on the Argaeids of Macedon including Alexander the Great; (2) Seleucid Coins Online (SCO); and (3) Ptolemaic Coins Online (PCO). Incorporated within these three tools will be (4) a monogram and symbols repository, (5) Greek Coin Hoards and (6) the scanned Newell notebooks, will provide full documentation of hoard evidence and provenance information for many individual coins. While all of the standalone tools will be interlinked, they will also be united through a portal site, (7) Hellenistic Royal Coinages, that will serve as a union catalogue for global searches and as a platform for later expansion, which will focus on adding the coinages of the remaining Hellenistic dynasties (Phase 2, post 2020).

Portions of Phase 1 have, in fact, already been completed. Early versions of three out of the seven components of HRC have already been launched.

1) **PELLA** has as its initial focus the voluminous coinages of Alexander (III) the Great, his immediate successor Philip II Arriaideus, and those produced posthumously in their names. Later versions of PELLA will incorporate the earlier Argaeid kings from Alexander I to Philip II. The basic concept of PELLA, like that of SCO and PCO, is to be a union catalogue of a known variety of Alexander’s coinage and then to provide a highly functional tool for identifying individual types of coins within a larger dynastic series, to provide illustrations, information, and statistical analyses on as many examples of the individual types as possible, and to provide as much information as possible on hoards containing examples of the individual types. The typology of the current version of PELLA (v.1) is based on that of Martin Price’s *Coinage of the Name of Alexander the Great and Philip Arrhaideus* (British Museum 1991).

A typical page on the PELLA website, that for Price Type 4² for example, provides (figs. 6–7): (1) a typological description (with links to the Nomisma.org thesaurus); (2) a map of hoard finds (with links to the relevant coin hoard page; see below); (3) links to and illustrations of 47 examples of Price Type 4 found in the collections of the ANS and Münzkabinett in

1. numismatics.org/search/
2. numismatics.org/peella/id/price.4
4. numismatics.org/peella/id/price.4
the incorporation of the unpublished archival material held at the ANS on individual hoards. Development of coinhoards.org has been funded to date by the ANS and Stanford University.

3) The ANS maintains an online archives website, ARCHER. With a grant from the Gladys Krieble Delmas Foundation, the ANS digitized more than 3,500 pages in 43 notebooks of Edward T. Newell for addition to ARCHER in 2015 (fig. 9). This was done in such a way as to allow interlinking between the digital notebooks, the ANS’s online numismatic catalogue (MANTIS), and online library catalogue (DONUM). Thus, if a coin mentioned in the notebooks currently belongs to the ANS, readers are directed to that coin’s record in MANTIS; if that coin had been published by Newell, readers are directed to the DONUM record for that publication; and if Newell discusses a hoard listed in IGCH, readers are directed to the relevant coinhoards.org page. To date, roughly 15% of the groundwork for this crosslinking between the notebooks and other ANS catalogues has been completed. A great deal more work remains to complete this as well as to link the monograms and symbols noted by Newell to the planned repository for these marks.

The major work that remains for Phase 1 of HRC is then twofold: (1) adding functionality to existing tools; and (2) building new tools. Once completed, Phase 1 of HRC will have a transformative effect on our approach to this important body of material. In a matter of seconds, anyone with an internet connection will be able to gather a wealth of critical information on royal coinages for a variety of purposes, whether for academic research, museum cataloguing, or just general interest.

2) In February 2015, the ANS launched a beta version of the Greek Coin Hoards website6 based on the 1973 ANS copublication Inventory of Greek Coin Hoards (IGCH), which lists and provides basic descriptions of 2,387 hoards, the majority of which date from the Hellenistic period. The current version (v.1) feeds hoard findspot information to PELLA, and allows for rudimentary searches of hoard information (fig. 8). Further development of the tool is necessary, however, to achieve its full potential. This will include the incorporation of data from an additional ca. 2,400 hoards derived from the print publications Coin Hoards (vols. I–X), links to the catalogue records of coins found in individual hoards currently held in public collections, links to bibliography on the individual hoards, and, most importantly, historical and cultural context with regard to the hoards.

Berlin; and (4) statistical analyses of the weights and die axes of these 47 coins. All told, the current version of PELLA catalogues 4,070 separate types of coinage with links to nearly 19,000 individual examples from twelve institutions located in the US, England, France, and Germany; by the end of 2017, thousands of more additional examples will be added from collections in the U.S., France, and England. Continued development of PELLA has become a collaborative, international initiative, not just in order to add more examples of individual types, but to edit and revise as well. Since Price’s 1991 typology is in need of extensive revision due to advances in scholarship over the last 25 years, a consortium of nearly a dozen researchers based in the U.S., England, Germany, and France, is currently working to revise the typology, which will appear in PELLA v.2, planned for late 2017. PELLA will then serve as the model for SCO and PCO, both in terms of functionality and development. With initial development work spearheaded by the ANS, others elsewhere will contribute to and facilitate further development of these tools.

5. numismatics.org/pella/contributors.
Unlocking the Book: How $106,000 Created Infinite Research Possibilities at the ANS

Arrested Content
It is 1996 in Columbia, Missouri, and I, Andrew Reinhard, am seated in the archaeology special collections room of Mizzou’s Ellis Library reading about pottery for my MA thesis. One book is open, and I’m taking notes from it with a pen and notecards: related people, places, and events. I am also robbing the book for relevant bibliography. Taking a break, I walk downstairs to pay the library’s Copy Center for the privilege of photocopying a few plates from the book. I walk over to the card catalogue to browse the physical card file for the new sources I found, only a couple of which are owned by the university. I walk over to the Interlibrary Loan desk to fill out request forms that with a little luck will retrieve books for me in 2–4 weeks from other libraries around the country. I don’t know (and cannot reach) many of the authors of the works I am citing. The pottery in the books are scattered internationally in museums and private collections I cannot afford to visit because of constraints in both time and money. When my thesis is defended successfully, two copies will be printed, one for the thesis library in the seminar room of the Department of Art History and Archaeology, and the other for the Ellis Library stacks where it sits, full of MA-level synthesis of material, which no one will be able to find and use unless they go looking for it specifically. Public Internet accessed via shared computers loaded with the Mosaic web browser would arrive a couple of weeks after my thesis defense. My thesis was a valuable personal exercise in learning how to research and write, but to the best of my knowledge, my MA work remains undiscovered, unused, and uncited.

Imprisoned.

The Printed Book-as-Gilded-Cage
Think of the last non-fiction book you read. Do you own it? Did you borrow it? What did you do with it after you read it? If you kept it, why? Printed non-fiction books do one thing really well: they preserve data and synthetic text and images as published at a single point in time. In fact, printed books work quite well as prisons for data. To access the information, I have to visit the physical copy of the book to find the data I am looking for. I can add notes in the margin that only I will ever see (like writing on a cell wall), or can take notes for something else that I am working on. The book goes back on the shelf. It will be unaware of what I do with the notes I just took. Any new information I find that can update that book’s scholarship will not appear in its pages (especially if it is out of print without hope of a reprint or new edition). The book is a one-way communication device. The author speaks to me through the pages, but I can’t talk back (most notably if the author is dead). As far as scholarship goes, this is quite inefficient. So how do you improve on a book, as beautiful as that gilded cage might be (fig. 1)?

Prison Break
Books go out of print. They become rare. Depending on their content, their value might increase in direct proportion to their scarcity. While this is a boon to bibliophiles, collectors, and dealers, the rarity and expense of these books serve as two major barriers for most scholars. In the case of numismatic books, one must travel to a special collection or library in order to see
This is easier said than done, but the results far outweigh the time and money required to convert the print to the digital, especially for out-of-print and rare books. So what are the benefits of a digital edition of a beloved text?

- Preservation: Thomas Jefferson favored the idea of producing multiple copies of printed documents in order to preserve and circulate ideas. This is especially important in the case for rare books where limited physical copies are often found in private or special collections with restricted access. Scanning and distributing these rare books preserves and promotes their content for those who need access to the written information (fig. 2) while reducing the need to handle the physical, delicate object. If the books become lost, destroyed, stolen, or hidden, their content remains public and accessible.

- Accessibility: As described above, digitizing books and putting them online makes their content available to anyone who wants it. That, however, is only one level of accessibility. Digital versions of printed material must be produced in such a way as to accommodate for offline as well as online use, and in a variety of formats. For some people, reading a book as a webpage is fine. Others might need a PDF to take with them into the field where there is either limited or no internet access. And some people would like to print the book from the digital source as print-on-demand (POD).

- Connections: The interdisciplinary nature of numismatics lends itself to the online, non-linear connections of the internet. Numismatic texts frequently include objects, people (past and present), places (past and present), events, other publications, and primary sources. Numismatics incorporates history, art history, archaeology, geography, economics, political science, and more, and nearly everything has a home online. With a digital edition of a numismatic text, the ANS can link directly from it to anywhere online while also making that text available to be linked from the outside. What was once content locked in print is now publicly available for anyone to use, adding to a web of content and context. The digital book is a portal.

- Images: In most numismatic publications, images of coins are reproduced at 1:1 (actual size), occasionally accompanied by enlargements. With digital editions, these coin images can be enlarged on-screen possibly providing additional visual information about the coins depicted. Depending on the resolution of a book’s scan, one can conceivably review coin images full-screen (fig. 3). One can also link images from the book to other images of similar material online (and vice versa).

Get Out of Jail Free
The American Numismatic Society has long championed the cause of making its data free to discover and use online. These Open Access initiatives include its online collections (MANTIS), archives (ARCHER), and library (DONUM), as well as international, collaborative efforts such as Nomisma.org (standardized vocabularies and authority lists), coinhoards.org (Inventory of Greek Coin Hoards), Online Coins of the Roman Empire (OCRE), and more.

Much of this Open Access work is funded through major federal grants. OCRE was funded by the National Endowment for the Humanities (NEH), and the ANS’s new major project on Hellenistic coinage received over $250,000 in NEH funding earlier in 2017. As seen elsewhere in this issue of ANS Magazine, these federally funded projects openly provide numismatic data and images to all, fulfilling the Society's mission to “promote and advance the study, research, and appreciation of numismatics” (Article XVI, ANS By-Laws).

The pieces missing from the Open Access puzzle were the ANS’s publications. In the 2000s, many of the ANS’s older monographs and journal volumes were treated as “orphans” and out-of-copyright by the Google Books Project, an effort to scan as many books as possible, placing them in the public domain. The non-fiction titles found a home in HathiTrust Digital Library (hathitrust.org) as semi-Open Access where only a percentage of pages could be read. In January 2015, the ANS signed an agreement with HathiTrust to make these scanned books available as completely Open Access under a Creative Commons license (fig. 4). The ANS, however, hoped to do more with its own titles. That opportunity presented itself almost immediately after the ANS signed the HathiTrust agreement. On January 15, 2015, the NEH’s Office of Digital Humanities (ODH) jointly published with the Andrew W. Mellon Foundation a call for proposals for the new Humanities Open Book (HOB) Program:

The Humanities Open Book Program is designed to make outstanding out-of-print humanities books available to a
Wishes Granted: The ANS and NEH

With the Humanities Open Book Program, the ANS saw a chance to fund the next phase of its Open Access publications mission, namely being able to take its books that had already been scanned, encode them in TEI XML, and then provide the tagged content for anyone to use in any format (e.g., EPUB3, PDF, HTML, and print-on-demand). TEI is an acronym for “Text Encoding Initiative”, a standards-and-practices consortium for representing texts in digital form. TEI creates guidelines for people to follow when making machine-readable Humanities texts, or converted text that can appear in various digital formats. XML (extensible markup language) allows someone to take its TEI-encoded text before it appears online or in an ebook, and apply “tags” to various parts of it, which can then link to other content in the text, or online. For numismatic texts these XML tags could include links to related people, places, and events, as well as related items in the ANS’s online collections and elsewhere. By also tagging paragraphs, titles, headers, notes, images, and captions, the final digital text becomes universal, able to be read on computers, handheld devices, and even turned into a PDF or a print-on-demand book. No matter what the output, the underlying TEI-encoded text allows for linking to and from the content, adding value to already valuable books (fig. 6).

The Andrew W. Mellon Foundation liked the proposal and awarded the ANS $45,000 in funding to follow through with the Humanities Open Book Program in 2016, completing TEI-encoding of 89 out-of-print, rare book-length publications. The ANS applied for and received an additional $61,000 from the Mellon Foundation in a second round of funding in March 2017 in order to make the ANS’s entire backlist of monographs available as Open Access. With the funding in-hand, it was time to create the digital editions as well as a home on the ANS’s website.

Building a Better Book

For the first round of the grant, under the project management of Andrew Reinhard, the ANS’s Director of Publications, and the technical guidance of Ethan Gruber, the ANS’s Director of Data Science, the ANS worked with a board of established numismatists to hand-pick its most popular, hard-to-find, and out-of-print titles to include. These came from a number of series beginning with Numismatic Notes and Monographs first published in 1920 (fig. 7). The books chosen also covered a wide swath of history, geographic regions, and coin-producing cultures. As all of these books had been scanned by Google and were in the public domain as PDFs, these files were sent to our TEI partner in India, AEL Data. The ANS had worked with AEL Data before when successfully creating the digital edition of Scott Miller’s Medallic Art of the American Numismatic Society, 1865–2014. Gruber had been introduced to AEL Data with a University of Virginia libraries project prior to being hired by the ANS. At a cost of around $300 per book, AEL Data extracted the text and images from each scanned PDF from Google, and then created a TEI XML file, which tagged all of the book’s elements as well as all proper nouns for people and places. The ANS received the files for the books on a rolling basis, and sent them to TEI specialist Whitney
Christopher to complete the tagging. A Digital Humanities (DH) PhD student, Christopher is conversant in TEI XML and was able to tag and link numismatic and Humanities-specific names, places, and events to relevant authority records in external Linked Open Data vocabulary systems shared by the international DH community. ANS-related names were linked to the ANS's own archival authority records and made available through ARCHER. Other names from the Virtual International Authority File (VIAF, used by OCLC, the Online Computer Library Center) and Social Networks and Archival Context (SNAC) were included for modern people and corporations, with links made available for download and use.

Creating a New Home for Old Books
In 2015 Gruber created the ANS's Digital Library (numismatics.org/digitalibrary/). Originally designed as a repository for unpublished numismatics MA and PhD theses and dissertations, the ANS decided to expand it to include digital editions of ANS publications (fig. 8). Upon receiving the Humanities Open Book Program grant in 2016, Gruber began building out that new functionality, receiving the Humanities Open Book Program grant in 2016, Gruber began building out that new functionality, with ANS publications more closely together.

To provide some concrete evidence of the benefits of being part of the first round of the HOB Program, Gruber ran some diagnostics on the final four of the group of Mellon-funded American Numismatic Society-published ebooks, which were uploaded to the ANS's Digital Public Library of America (DPLA), both organizations crawlable by internet search robots, making these materials available to users through major search engines. The ebooks are a gateway between disparate information systems, and through these documents we may bind our library, archive, and numismatic collections more closely together.

The original 89 books selected by the ANS for the first round of the Humanities Open Book Program had been made better and more useful for 21st-century scholars. The out-of-print titles were rescued from obscurity and were about to be made available for free. But there was one last loose end: where to make these digital editions available for download and use.

The ANS has the HTML, EPUB 3, and PDF ebooks in its Digital Library. As per the conditions of the grant, the EPUB 3 files were also given to HathiTrust for archiving and dissemination. Based on the HathiTrust's hosting of these ebooks, they are now also accessible in Digital Public Library of America (DPLA), both organizations crawlable by internet search robots, making these materials available to users through major search engines. The ebooks are a gateway between disparate information systems, and through these documents we may bind our library, archive, and numismatic collections more closely together.

To provide some concrete evidence of the benefits of being part of the first round of the HOB Program, Gruber ran some diagnostics on the final four of the group of Mellon-funded American Numismatic Society-published ebooks, which were uploaded to the ANS's Digital Library. The statistics were derived through various SPARQL queries of the TEI->Open Annotation RDF:

- 349 mentions of 164 different Greek coin hoards published in Inventory of Greek Coin Hoards in 193 sections in 14 books.
- 266 unique references to Nomisma URIs. 146 are mints or regions, and 87 of these identifiers are matches with Pleiades places. These mint references appear in 600 sections in 51 books. Including direct Pleiades references (and not only those which are implicit by means of Nomisma concordances), there are 621 sections in these 51 books, which will be accessible through the Pelagios Project.
- 97 of the 266 references are to people, most of whom are linked to Wikidata and VIAF entities that are, in turn, linked to other systems, such as Social Networks and Archival Context.
- More than 1,400 coins in the ANS collection are referenced.
- 139 Roman Imperial coin types in OCRE.
- 4 Roman Republican coin types in CRRO.

Thanks to the funding provided by the Andrew W. Mellon Foundation, the framework and methodologies implemented in this project will be applied to further digitization here at the ANS as we move toward making our entire collection of monographs freely and openly accessible, and the ANS hopes that other academic publishers and learned societies will follow in our footsteps in this endeavor.

These books go beyond simple transcription and publication as EPUB files. With links to the ANS's own research databases internally and externally to Linked Data information systems, the ANS hopes that these works will be transformed into research portals to further context about the people, places, events, etc. mentioned in the text. Also, researchers interested about the entities, objects, coin hoards, etc., will have access to a wealth of historical information about these things and will gain access to the ANS's monographs not only from its own library, archive, and museum systems, but through projects such as Pelagios, DPLA, and other large-scale aggregators of cultural heritage materials (fig. 9).

What’s Next?
With the successful completion of the first round of the HOB Program, the ANS begins Round 2, TEI-encoding its remaining monographs for free and open access. Gruber is writing a series of programming scripts that will automate and expedite the creation of tags in the
TEI XML files as received from AEL Data, making that code available as open source. These converted, digitized texts will join the first batch of books in the ANS’s Digital Library and on hathitrust.org.

Looking ahead to the rest of 2017 and beyond, ANS Publications will begin converting PDFs of each new book into tagged TEI XML so that these robust, flexible digital editions are ready for Open Access distribution in the ANS’s Digital Library one year following the print edition’s publication. Reinhard’s previous publishing experience and similar experimentation at the American School of Classical Studies at Athens (ASCSA) has shown that making digital editions available at no charge does not undercut sales of the print version. Many readers prefer to read printed books, but also appreciate the added functionality (and portability) of their digital counterparts. While the ANS continues to pursue modern distribution methods of published research, it will not stop its printed publication program. Print and digital will continue to work together, a harmonized union of text, data, and media, reaching all audiences.

Coda
It is 2017 in Columbia, Missouri. A graduate student sits in her carel at Mizzou’s Department of Art History and Archaeology. She connects her laptop to the university’s wifi and logs in to the University Libraries’ website, running a search on the coinage of Alexander. She finds a record for Alexander’s Drachm Mints II: Lampsacus and Abydus, by Margaret Thompson, published by the American Numismatic Society in 1991. The print edition is checked out (likely by her adviser), but the digital edition is available. She navigates to it, opens it with a click, and begins to read. People, places, events, and objects are highlighted throughout the text, and she clicks on each instance hunting for new data, a new direction for her research to take. She links to the Pleiades entry for Lampsacus, which relates to Hellespontus and Tros, and also has a Barrington Atlas entry. She finds MANTIS links to coins minted under Alexander’s authority at Lampsacus now in the ANS’s permanent collection, but she also discovers many more coins at the ANS that were accessioned by the ANS after the book was published. Her data set has increased, giving her more specimens to work with and more leads to follow. She browses the collection in New York from her desk in Missouri, and ultimately decides that it is worth the trip to see these coins for herself. Having all of this access to digital content has both expanded and focused her research, giving her a plan of action, which includes seeing the originals in person.

While at the ANS, she visits the library to see a copy of the book that brought her here, an artifact from before the Internet. 8.5 x 11 inches, thin, with gold-stamped red cloth over cardboard covers. It feels and smells like a book. She flips through the pages and plates, the content familiar but a little alien in this format, and she wonders when was the last time someone had held this particular copy. Its pages are pristine. Unseen links lead from it to dozens of other books in the library, fanning out to hundreds of coins in the vault, then out doors and windows to places far beyond the ANS’s building in the Tribeca neighborhood. In her reverie, she returns the book to the wrong shelf, in effect losing it for the next guest who—while unable to find it in the stacks after a few minutes of frustrated looking—locates it online in seconds, ready to use, and linked to the wider world.

Acknowledgement
The ANS would like to thank Don Waters and his team at the Andrew W. Mellon Foundation, and the National Endowment for the Humanities and its Office of Digital Humanities (fig. 11) for their continued, enthusiastic support of the ANS’s Digital Humanities and Open Access projects.