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Specters in the archive: faculty digital image collections and the problems of invisibility

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"The prejudicial implications of continuing to see images linguistically, that is, as a lesser, transitory, and illusory form of written communication, are still playing themselves out."

- Barbara Maria Stafford[1]

Introduction

Barbara Maria Stafford, in her book *Good Looking: Essays on the Virtue of Images*, argues that Western culture has generally placed visual information as an inferior second to the information presented in textual form.[2] This paper offers argues that this devaluation will result in a loss of visual information in a digital form that has personal, institutional and cultural ramifications. Framing this discussion is a study of the digital preservation practices among two faculty user groups, archaeologists and art historians. The study examined the faculty users' knowledge, perception, emotions and processes surrounding the digital images they had created and, or collected to support their professional activities. What was discovered is a worrisome situation where an important part of the cultural record is at serious risk of being lost.

Growth of personal digital image collections

The development of personal digital image collections is a relatively new phenomenon that has had broader implications that surpass those of the

individual collector. For a little over a decade the author worked in visual resources collections helping faculty and students find, create, and use images to support their creative and scholarly work. In 1995, when the author first embarked on this career path, digital images were just beginning to appear in the academic setting and the faculty members were by and large unimpressed with, and resistant to, the technology. By 2005 a marked shift from analog images to digital images could be seen.[3] As they had often done with the previous image technologies available to them, faculty recognized the changing technological landscape and began to amass their own digital image collections. The faculty collected digital images from a variety of resources: web sites, image databases, article PDFs, personally scanned print items, digital images they had taken themselves during study and travel, images created through graphical software, exchanges among colleagues, images from museums, etc. While digital images provided faculty a level of flexibility and convenience that analog collections lacked, these growing personal collections have had repercussions that have largely gone unrecognized.

In the development of personal digital image collections faculty have created silos of images that are private, isolated, largely redundant, and invisible. In the process of creating their own hoard of digital images faculty are, at least in part, replicating the work of their colleagues. Some of whom are working in the next office. Also lost in the private collection development process is the collegial and scholarly exchange over visual information that had existed in the past, thanks to institutionally supported collections. By building personal image collections there is nothing "there" to attest to the activities of the faculty or the research strengths of the institution. More importantly for the current discussion is that we can examine what specific images were available for teaching and research at the institution during a specific period in its history. Institutional amnesia results from individually developed faculty digital image collections.[4]

Image collections, just as is the case with traditional library collections, reflect the curriculum of the institution and the research interests of its faculty. Examining the image collection contents of one institution might reveal to researchers that the ancient world was not taught beyond an introductory level, and that in this same collection American art had not been taught since the 1970s. Institutions with lantern

slide collections, some of which date to a century ago, can be examined for what visual information was available for pedagogy and research. These early visual collections provide critical historical information about what items were considered canonical to the study of a discipline. Beyond their usefulness to the study of an institution's curriculum or a discipline, images also provide now lost views of geographical locations, archaeological sites, modified or destroyed art work, people and everyday life from the late 1800s and early 1900s. A lack of information at the institutional and cultural level results from the loss of images.

An exemplar

ARTstor, the image repository developed through the support of the Andrew W. Mellon Foundation, contains a collection of approximately 3900 images named the *Mellink Archive*.[5] The collection is named for Machteld Mellink (1917-2006) who taught for nearly 40 years in the Classical and Near Eastern Archaeology Department at Bryn Mawr College.[6] Mellink, an archaeologist who excavated at numerous sites in Turkey, documented her work and the world around her during her extensive travels in the form of 35mm photographic slides. She brought these images back from her field studies and used them in her teaching, research and publications. After she had been retired for many years, the college found itself needing to reuse the space that had once been her office. Within that office sat thousands of slides that spanned a lifetime of her teaching and scholarship. This collection of slides was digitized, described and processed by Bryn Mawr College so that other individuals could benefit from Mellink's educated eye.[7]

Several images from the Mellink Archive are included here as proof of the importance of visual documentation. Image 1 shows a Neolithic structure from Çatal Höjük, one of the most important Neolithic archaeological sites in Turkey, that was captured by Mellink in 1962. While at first glance this image may appear nondescript and perhaps even downright uninteresting, in fact the image shows a structure whose walls were constructed of mudbrick some 10,000 years ago. Mudbrick, unlike it fired counterpart, is a fragile building material made of sun-dried mud that would have originally been covered by lime plaster for protection. Once exposed to the elements through excavation the mudbrick captured in this image would deteriorate from exposure to the elements within a

year or two.[8] Through her image we are able to get a glimpse, now lost, into the materials and methods of Neolithic masons.

Image 1. *10,000 year old Mudbricks from a Neolithic structure at Çatal Höjük, Turkey.* (Photographed by MJM in 1962, Image © Bryn Mawr College).

Image 2. *Storehouse (ambar), Seyret, Turkey.* (Photographed by MJM in 1962, Image © Bryn Mawr College).

While ancient architecture and cultural objects were Mellink's primary photographic subjects, she also recorded contemporary structures, people and events in her travels. Vernacular structures like the rustic *ambar*, or storehouses for grain (Image 2), found in the Turkish countryside were captured by Mellink during her visit to Turkey in 1962. Mellink also recorded images from everyday life in the Turkish villages she visited (Image 3). One has to wonder if gender was a factor in her ability to capture such direct photographs of women and girls in their colorful, patterned native costumes. As images bearing testament to traditional vernacular forms of architecture and everyday life in mid 20th century Turkey, their appeal goes far beyond that of recalling an interesting journey. Architects, agronomists, ethnographers, genealogists, costume designers, and historians would be among a host of users who would find these images intriguing and worthy of study.

This realization that a whole history of faculty image making and collecting was no longer visible in a tangible form or at an institutional level led to this current study. This research examined how current art historians and archaeologists, faculty who work closely with images in the performance of their teaching and research, were saving and archiving their digital image files and how important they felt their image collections might be to their institutions and the world beyond.

Image 3. *Pazarli costumes, Bogazkale (Bogazköy, Hattusha), Turkey.* (Photographed by MJM in 1953, Image © Bryn Mawr College).

Current Study

As a means to examining the art historians' and the archaeologists' thoughts, feelings and behaviors surrounding saving and archiving their digital images, several research questions were developed. The following questions were used to frame the study:

- How are faculty archaeologists and art historians saving and archiving their digital image files?

- How aware are faculty archaeologists and art historians of institutional repositories and their staff?

- What are the faculty archaeologists' and art historians' attitudes toward saving and archiving their digital image files?

Participants

A research study of these two professional image user groups was conducted in 2008-2009 to examine these questions. Eight participants, four faculty participants from two image-dependent disciplines (archaeology and art history), were recruited for the study. These user groups were selected based on their similarly strong need for images of cultural materials to support their work. Selecting user groups employing similar visual materials in their work was done to bring into sharper focus any differences to be discovered between the two disciplines. Finally, first-hand knowledge of and access to individuals from these two user groups was critical to the successful recruitment of participants. This fact was also considered in the design of the study.

The selection criteria for the participants were based on the particular career path chosen within their respective professions. Each of these professions has multiple possible career tracks, but the study restricted the kind of work performed by each of the participants recruited. The participants included in both the Archaeologist and Art Historian user groups were expected to be actively involved in teaching and performing research at the college or university level. Thus these two groups shared a common foundation in the pedagogical and research-oriented work they performed.

Although each participant in the study was involved at teaching at

the postsecondary level, there was an effort to recruit individuals from across a broad spectrum within their respective domains. As can be seen in Table 1, the participants who took part in the study ranged in age, years in profession, rank, specialization within their domain and institutional setting. This variation was sought after to avoid the possibility of biasing the findings of the study to one particular research community within a domain. It should also be noted here that although the researcher contacted many potential male participants, none took part in the study. This is in itself an interesting finding that suggests some underlying phenomenon based on gender at work within these two domains.

Table 1. Demographic characteristics of participants by user group

No. in Group	Gender	Education	Years in Profession	Position	Area	Setting
Archaeologist User Group						
4	4F	Ph.D.	15-40	Instructor, Asst. Professor & Professor	Etruscan, Greek, Roman, Hellenistic	Small college & large university
Art Historian User Group						
4	4F	MA & Ph.D.	15-41	Instructor & Professor	Ancient, Medieval, Renaissance, Contemporary	Small college & large university

Participants were recruited using the so-called snowball, or chain method.[9] Through this method individuals known to the researcher acted as contacts for additional professionals in their discipline. Potential participants identified in this way were contacted by the researcher and a series of basic questions were asked to determine if the individuals met the study's inclusion criteria. Participants who met these criteria and expressed a desire to continue on with the study were contacted and a meeting was scheduled between the two parties. After the required Institutional Review Board documents concerning the study had been explained and signed, data collection began.

Data Collection and Analysis

Data for this study was collected from each participant through a paper-based survey and a one-on-one semi-structured interview recorded using two Olympus digital voice recorders. The participants' survey responses were transcribed by the author using Microsoft Word. The interviews were transcribed using SoundScriber 1.0.0.0[10] and Microsoft Word. Verbal (e.g., laughing, sarcasm) and non-verbal communications (e.g., grimacing, confusion) which had been noted during the interviews were added to the interview transcripts in brackets. These were added as they often provide important clues to the participants' state of mind concerning the topic at hand. The image users' processes, behaviors, thoughts and opinions discussed in the surveys and interviews were analyzed using case-ordered displays and the constant comparative method through the qualitative research software NVivo.[11]

The survey and interview responses were imported into NVivo and were examined for several kinds of content. The first method of analysis, case ordered displays, consisted of culling all direct, fact-based responses to the researcher's questions. An example of this type of question-response would be a question which asked the participant to provide a list of the specific kinds of storage media they used to store their images. The responses of all of the participants were then compared within their user group and across both user groups. Another analysis of the data examined thematic patterns that emerged from the participants' responses. An example of a theme would be the frustration the participant experienced in attempting to find a particular image. Repeated passes through the data revealed additional themes of note. The emergent codes were recorded, defined and revised as the data was read and re-read.

Two checks were completed for this study to evaluate the reliability of the findings. These consisted of an inter-coder assessment and member checks. To ensure that the codes were reflective of the actual themes present in the data, eight coders were recruited to check passages taken from the collected data. The coders were given a defined list of codes and asked to assign two codes, one at a granular level and one at a detailed level, to twenty-five passages. The codes from each coder were collected and the inter-coder agreements were then tallied and compared. The granular codes applied to the passages saw a 96% agreement rate across all of the coders and the researcher. The more finely grained codes

achieved an agreement rate of 81%. These agreement rates among the coders and the researcher were sufficient according to Holsti's reliability measure threshold of 80%.[12]

The member check that was conducted consisted of sending a brief summary of the findings to one participant in each user group. The aim was to speak with one individual from each group to ensure that what was being reported was in fact an accurate reflection of their behaviors, thoughts and feelings towards archiving their images. Telephone re-interviews were carried out and the participants' comments on the summary were gathered. The responses of the participants received during the member check interview confirmed that the researcher had been able to capture their behaviors, thoughts and beliefs in the summary. [13] As the researcher had set out to provide an accurate description of the participants' thoughts, beliefs and experiences surrounding their image archiving, support of the findings by the participants was a critical component in ensuring the reliability of the study.

Findings

Saving digital image files

Several of the study's questions sought to discover if and how these two user communities were saving their digital image files. In the case of the archaeologists, two participants (A 1&3) said they saved everything while the two others in this group only saved unique images (A 2&4). These two participants noted that they were interested in saving research-oriented images or other things with "value." The art historians were generally more interested in saving their image files, with three of the participants noting they saved everything (AH 1, 2 & 3). One art historian (AH 4) noted that she only saved her digital images sporadically.

Backing up digital image files

The participants were also asked if and how they were backing up their digital image files. Two of the archaeologists (A 1 & 3) noted they were backing up their collection of image files to a flash drives and sometimes to CDs. The two other archaeologists (A 2 & 4) in the study only backed up a portion of their images and these were saved CDs. Archaeologist 4

mentioned that she would on occasion place images within a PowerPoint file and then upload them to the course management system Blackboard. Similar to what was found with the archaeologist group, half of the art historian participants (AH 1 & 3) were backing up their image collections' files. They accomplished this by using external drives, flash drives, and CDs. One of the art historians (AH 4) only backed up some of her image files to CDs. She noted that she had an external drive but that it was still unused and in the box. Finally, one art historian-participant did not back up any of her image files, although she was aware of the potential problems that would result from a hard drive failure. Somewhat paradoxically this participant was the most vocal in the art historian group concerning the frustrations she experienced in association with obtaining images (digital and analog) for her publications. Another issue that revealed itself during their conversations about backing up their image files was that participants did not feel confident about their preservation practices, with most asking the researcher to help them with this process and the various technologies associated with it.

Awareness of Institutional Repositories

In order to assess the faculty's knowledge of institutional support available to them, the participants were asked a series of questions about institutional support for saving and archiving their digital image files. The first question asked if, as far as they were aware, the institution they were associated with had an institutional repository. Although each institution had an institutional repository in place, none of the participants knew about these systems. In response to this question the archaeologists discussed image databases (MDID & ARTstor) and course management software (Blackboard). The art historians responded to this question in a similar way, discussing image databases (MDID & ARTstor), course management software (Blackboard) & networked server space at their institution.

Awareness of staff

The participants were next asked if there were staff available to them at their institution to help them with their image needs. In response to this question all of the archaeologists mentioned institutional staff available to help them create images. One participant in this group (A 4) mentioned

that the person responsible for developing the images she uses for teaching tended to not want to incorporate the images that were sent by the faculty member into the institutional collection, mainly because they lacked adequate source information. Similar to what was found with the archaeologist group, all of the art historians were aware of staff to help them with the images they needed for teaching. Two of the art historians mentioned staff reluctant to incorporate their images into the institutional collection. One art historian-participant (AH 2) noted that instead of using her images, the staff member tried to find each of her images in various printed sources. The importance staff members place on documenting appropriate sources for each image over the faculty's needs was reiterated by another participant in this group (AH 4) who indicated that the staff member wanted source information for all of her images. She noted that this was impossible since some of the things she uses to teach with are 20 year old advertisements from who knows where. As these last passages suggest, the faculty participants expressed strong feelings in connection to their images. The remaining findings turn to this topic in more detail and discuss the feelings and attitudes the participants associated with images.

Findings: Attitudes about archiving their digital image files

After the participants discussed their behaviors surrounding saving and backing up their image files, the researcher explained the concept of an institutional repository to them and asked if they would be willing to have their items archived by their respective institutions. None of the participants in the two groups were keen on the idea of submitting their images, although in a few cases there was recognition that doing so could be potentially useful.

The archaeologist-participants did not generally believe the digital image files they had created or amassed were important enough to be saved, and so the typical response to the question was negative. Archaeologist 3 stated her feelings plainly,

> "What I am doing, nobody else would find it useful."
> (A 3, [549-550])

This attitude was shared even by the archaeologist-participant who

was working on an archaeological site that is no longer visible because the site is back-filled as it is excavated. The response of the participant to the researcher's question about the possible importance of her digital images as the only visual documentation of the site was intriguing.

> "I kind of blow hot and cold on this since there are thousands of little sites like this. So I don't know that it is unique."
> (A 4, [939-940])

Adding to the complex nature of the value the participants placed on digital images, this same archaeologist noted the pictures she has of students working at the site she excavates might be useful to save. When asked about why these images were considered important enough to save, she stated the images with students in them could potentially be useful to the alumni association at her institution. She also believed that the photographs she had that were of her should be saved since they would be helpful for public relations purposes. The

The art historians were more varied in their attitudes toward placing their materials in institutional repositories. One art historian-participant responded that she would send her images to an institutional repository, but was quick to add that,

> "… as an instructor rather than a tenured faculty I don't know that I would receive this level of service from the institution."
> (AH 1, [484-486])

Two art historian participants indicated that they might consider having their image files archived in this way in the future. One participant (AH 2) in this user group said she had no need to send her image files to an institutional repository because her images were not unique.

Findings: Attitudes about images they need to teach

The above sections concerned direct responses that were given in response to the questions administered through the survey and interview instruments, this section and the next consist of themes found through

content analysis done on the entire data corpus gathered from the participants' interviews. The overall theme found in association with their retrieval and use of images was frustration. For the current discussion frustration was most often associated with finding the images that were needed to support their teaching. In some cases the images being sought are for what these individuals felt were canonical images to their field.

> "It's time-consuming … we have all the research on it. It's very well studied and photographed. It took me five hours to get the images."
> (A 1, [217-229])

While all of the participants recognized the benefits that digital images provided once the images were discovered and saved, the process of finding them was a clear strain on their schedules.

> "Sometimes, God, sometimes it can take all weekend … maybe 10 or 12 hours to find all the images I need for a 3 hour lecture … I am always pressed for time … even if I search a week in advance I can't find everything."
> (AH 1, [179-181])

When participants attempted to search for images of lesser known cultural objects they had difficulties finding what they sought. This was doubly frustrating as they had typically spent a great deal of time searching for items that they ultimately could not find.

> "I found about 10% of what was needed."
> (A 2, [143])

The inability to find what they sought had a negative influence on the participants' teaching and research. Archaeologist 2 discussed how she had recently prepared a new course on Mesopotamian archaeology where the number of images she could find was so low that she modified

her lesson plan to show images once in every three meetings instead of her usual pedagogical process of using them in every session.

Findings: Attitudes about images they need to publish

The participants were also found to feel a great deal of frustration in relation to the images they needed to support the publication of their research. Several aspects were found to be the primary stressors associated with these images and these were the time, effort and costs that needed to be expended in order to publish images to accompany their publications. Providing images to accompany a text was a costly endeavor with many having to pay fees for copyright purposes or photographic services.

> "If I needed a detail of that particular painting I would need to
> hire a photographer for that at a vast expense."
> (AH 2, [170-171])

Fees were found to be just one part of the equation these scholars face in attempting to provide illustrations for their publications. In addition to this the participants spent a great deal of time tracking down copyright holders and seeking permissions for images they wanted for publication purposes. This archaeologist clearly states the various difficulties she encountered in the preparation of her publication,

> "They wanted $ 30 for every image and a copy of my book for
> each image …I think I wanted 5 photographs from them. That is
> a lot of money … Another person never answered my letters. I
> sent him four letters."
> (A 1, [72-81])

Copyright was also found to be a restrictive force on their ability to publish their scholarship with accompanying visual information. Several individuals discussed problems with gaining permissions from copyright holders, as can be observed in the following passage.

> "I am co-writing an article … we are trying to get the pictures together to illustrate the article. Which you run into copyright problems."
> (A 4, [115-118])

It is clear from the results of the study that the frustrations these participants experience are generally associated with images they need to support their work that are not currently in their possession, or those that are inaccessible because of copyright restrictions. This is an interesting finding as it indicates that although these participants did not place a great deal of value on the images they had in their possession, they experienced frustration because of a lack of access to images beyond their own personal collections. Sharing their images with others through institutional repositories as a means of pooling resources could help alleviate at least a portion of the cause of their frustration.

Discussion of the findings

This study found that although the academic archaeologist and art historian participants in this study needed many images to support their teaching and research, they generally did not understand preservation issues surrounding their images or recognize how their images fit within the body of visual information associated with our common cultural heritage. Although they were actively collecting digital images for their work, the preservation practices associated with their images were generally done on an ad hoc basis. The majority of the participants believed they lacked the knowledge and skills needed to adequately manage and archive their digital image files. Institutional repositories, which could help these users archive their image files, were beyond the knowledge landscape of the participants.[14] Staff members in institutional image collections while known, were often viewed as being unhelpful in issues surrounding their personally developed image collections. While all of the participants recognized the import role images play in their work, they saw little or no value in the images they created or possessed for anyone beyond themselves. This belief had a potentially dampening effect on the motivations for the participants to share and archive their digital image files through institutional repositories.

It is useful to consider here the question of whether or not we should care about the preservation of these image collections given the host of thorny issues associated with them. These issues could complicate the work of librarians and archivists if they were to assume the responsibility for these collections. There are intellectual property rights questions to be answered, with many personally developed image collections having little information associated with their sources or copyright holders. However, the current state of affairs on the web as can be witnessed by a search for a copyrighted image using Google would suggest we are headed in an entirely new direction as far as copyright is concerned. It is also useful to ask ourselves if providing access to these images through institutional repositories of libraries and archives would be exempt based on the fair use factors found in Title 17 U.S.C. Section 107.[15] For those institutions and collections where the copyright status of these items is questionable, restricting access to the images through on campus machines, or through individual researcher requests remains a valid option.

Additional issues concern access and quality, as few personal digital image collections were developed with what would be considered a uniformly professional level of skill. This argument may be a valid one against archiving and sharing these files in institutional repositories since they are not entirely useful items if they cannot be accessed and displayed effectively. However the question concerning how much metadata is too little for useful visual information retrieval remains unanswered.[16] Image quality too can be problematic with these collections, since they will likely contain a mélange of inferior and high quality items. However, as would be found with textual material if offered the choice of a poorly scanned article or no article at all, some users would opt for the former. This discussion of the various problems encountered in working with personal digital image collections of faculty should at least help in begin the dialog surrounding whether or not these collections should be actively sought out and archived.

Another aspect that needs to be discussed is the image vs. text bias that continues to be found within the profession. Paul Conway in his article discussing the current state of preservation within the cultural heritage community notes the asked "[c]an a profession raised and nurtured on the care of books and paper reorient its identity to give equal attention to film and magnetic media?"[17] Images, moving and still, along

with recorded sound, provide a mode of information that is different, but not less rich than text. For example, photographs produced by Eadweard Muybridge in the 19th century revealed aspects about the natural world that had previously been unknown,[18] and a recent study of medical students who underwent an art appreciation course showed an improvement in their diagnostic abilities.[19] Images currently account for the largest percentage of material by format in institutional repositories.[20] This fact alone indicates the importance of visual material to the pedagogical mission of educational institutions, and should suggest to the profession that images (and sound) are worthy of the same treatment as text-based items.[21]

Conclusion

Several efforts can help alleviate the loss of faculty digital image collections and these consist of educating faculty about preservation practices, performing outreach and marketing for institutional resources and staff which support these efforts, and in recognizing the value of the collections themselves. The first of these consists of providing faculty with information concerning how to save and back up their digital image files. These user groups would benefit from clear and direct guides to the processes and storage media useful to their needs. Also useful would be one-on-one discussions with faculty about the extent of their storage needs and the availability of institutional staff and resources to support their efforts. The lack of knowledge surrounding institutional repositories among these participants suggests that better marketing and outreach to faculty are needed. Encouraging faculty to archive their images within an institutional repository is likely to increase the use of these systems, since through this process the advantages of using them will become clear to their faculty users. Perhaps the most important of these is the acknowledgement among professionals entrusted to the care of our cultural heritage that these digital image files are worthy of being saved. Since faculty place such a low value on their images it is clear that without staff intervention these virtual collections will vanish.

Images are documents of our common cultural heritage and as such they support the development of knowledge, clarify concepts, communicate inexpressible ideas, provide inspiration, aid in cognitive recall, develop skills of critical analysis, connect people and provide

evidence.[22] The image collections of faculty are developed to meet their teaching needs in their particular domains, and they also grow in response to the highly specialized research needs of a single scholar. The various images of the faculty working at a single institution reflect the curriculum and the research that has been conducted within its confines. Visual information is rich primary source material for future researchers. However, since digital images tend to live on personal drives, devices, and storage media there is nothing "there" to be easily recognized, retrieved and archived by institutional staff. Since this study has shown that faculty tend not to attach value to the images within their possession there is a clear indication that their personal image collections are at risk. Whether or not this risk is recognized and addressed will determine if individuals in the near and distant future will have the same breadth and depth in the image collections available to them that we once enjoyed in a purely analog world.

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[1] Barbara Maria Stafford, *Good Looking: Essays on the Virtue of Images.* (Cambridge, MA: MIT Press, 1996), p. 22.

[2] Ibid. Stafford presents a thorough history of the devaluation of visual information over that presented in a text-based form through a series of well researched essays in this book.

[3] The adoption of digital image technology appears to have been precipitated by a confluence of several forces in a short period of time in the early to mid 2000s. During this period the Eastman Kodak Company stopped manufacturing professional 35mm slide film (the first was discontinued in 2001) and slide projectors (2004), the cost of computer processors and memory began to fall (2001), Google Images was introduced (2001), and ARTstor became available through subscription (2004).

[4] Also not well-considered are the magnitude and complexity of issues associated with maintaining a collection of well organized, thoroughly described and accessible digital images.

[5] For more information about Mellink and her image collection see ARTstor, Mellink Archive (Bryn Mawr College) (August 20, 2009) available: http://www.artstor.org/what-is-artstor/w-html/col-bryn-mawr-melli.shtml (March 27, 2011).

[6] Crawford H. Greenwalt, Jr., "Machteld Mellink, 1917-2006," *American Journal of Archaeology*, 111 no.3 (2007): 553-558. Available: http://www.ajaonline.org/pdfs/111.3/AJA1113_Greenwalt.pdf (March 28, 2011).

[7] Mellink's collection can also be accessed through Bryn Mawr College at: http://triptych.brynmawr.edu/cdm4/browse.php?CISOROOT=/Mellink (March 28, 2011).

[8] Ian Hodder, "Re: Inquiry: Mudbrick preservation at Çatalhöyük." Message to Joan E. Beaudoin (March 1, 2011). Email.

[9] W. Paul Vogt, *Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences*, (Thousand Oaks, CA: Sage, 2005), p. 268; Michael Quinn Patton, *Qualitative Research and Evaluation Methods*. (Thousand Oaks, CA: Sage Publications, 2002), p. 237-238.

[10] University of Michigan Regents, SoundScriber software. (n.d.). Available: http://www-personal.umich.edu/~ebreck/sscriber.html (March 28, 2011).

[11] QSR International. Nvivo 9 research software for analysis and insight, (2007). Available: http://www.qsrinternational.com/products_nvivo.aspx (January 27, 2011).

[12] Ole R. Holsti, *Content Analysis for the Social Sciences and Humanities*. (Reading, MA: Addison Wesley, 1969).

[13] Archaeologist 3, Architect 6, Art Historian 4 and Artist 6 were the participants who took part in the member check.

[14] A low level of knowledge concerning institutional repositories among faculty was also found in the following study. Primary Research Group, *The survey of higher educational faculty: Use of digital repositories and views on open access*. (New York: Primary Research Group, 2009), p. 19. Available: http://www.primaryresearch.com/view_product.php?report_id=167 (March 28, 2011).

[15] See Peter B. Hirtle, Emily Hudson & Andrew T. Kenyon, *Copyright and Cultural Institutions: Guidelines for Digitization for U.S. Libraries, Archives, and Museums*. (Ithaca, NY: Cornell University Library, 2010). Chapters 5, 6 and 10 are particularly useful to issues surrounding copyright within the library and educational sector. In chapter 10 these authors provide a risk analysis calculator and they state that libraries and educational institutions have been generally been overly cautious as far as copyright and digitization efforts have been concerned. Available from: http://ssrn.com/abstract=1495365 (March 28, 2011).

[16] John Attig, Ann Copeland and Michael Pelikan, "Context and meaning: the challenges of metadata for a digital image library within the university," *College and Research Libraries*, 65 no.3 (2004): pp. 251-261. This research team set out to develop an effective appropriate metadata infrastructure to support a digital image library at Penn State, and concluded that rather than trying to reconcile some very different data types and users among the varied image collections on campus, they should work toward discerning what minimal level of data is needed for the retrieval of visual.

[17] Paul Conway, "Preservation in the age of Google: digitization, digital preservation, and dilemmas," *Library Quarterly*, 80, no. 1 (2010): p. 73.

[18] Eadweard Muybridge, using series of cameras, captured the motion of humans and animals. One of these studies was of a galloping horse which proved once and for all that in this gait all four of the horses feet are off the ground. See his *Muybridge's Complete Human and Animal Locomotion: All 781 Plates from the 1887 Animal Locomotion*. (New York: Dover Publications, 1979).

[19] Sheila Naghshineh; Janet P. Hafler; Alexa R. Miller; Maria A. Blanco; Stuart R. Lipsitz; Rachel.P. Dubroff; Shahram Khoshbin; and Joel T. Katz. "Formal art observation training improves medical students' visual diagnostic skills." *Journal of General Internal Medicine*, 23 no.7 (2008), pp. 991–997.

[20] Steven Hitchcock and David Tarrant, "Characterising and Preserving Digital Repositories: File Format Profiles," *Ariadne*, 66 (30 January 2011). Available: http://www.ariadne.ac.uk/issue66/hitchcock-tarrant/ (March 28, 2011).

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[21] David Seaman, "Discovering the Information Needs of Humanists When Planning an Institutional Repository," D-Lib, 17 no.3/4 (March/April 2011). Available: http://www.dlib.org/dlib/march11/seaman/03seaman.html (March 28, 2011). doi: 1-.1045/march2011-seaman. Seaman's study of faculty at Dartmouth College suggests that at least some humanists are interested in using an institutional repository for their images. Of the 13 humanities faculty members interviewed 8 noted they would use the IR for their images.

[22] See chapter 6 of the following for a complete account of the uses for images among archaeologists, architects, art historians and artists. Joan E. Beaudoin, "An investigation of image users across professions: A framework of their image needs, retrieval and use." Ph.D. diss., Drexel University, 2009. Available: http://hdl.handle.net/1860/3160 (March 28, 2011).