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Imaging Sacred Artifacts: Ethics and the Digitizing of Lichfield Cathedral's St Chad Gospels

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Abstract

This essay examines complexities that attend digitizing a cultural heritage artifact that is sacred to a contemporary community. It argues that scholars must first determine how the artifact participates in the life of its community. If this participation is integral, scholars should treat the artifact as a present-day cultural phenomenon, inseparable from its community. To explain the implications of this shift, the author turns to ethnography, which has a lengthy tradition of interacting with communities for generating research. Photographing a sacred artifact is not unlike other ethnographic research, whether tape recording stories, collecting documents, or gathering information about social practices. To guide digital work, the essay proposes ethnographic ethical principles, demonstrating their value in digitizing the 8th-century St Chad Gospels at Lichfield Cathedral, England—supporting Jamie Bianco's recent call for an "ethical turn" in the digital humanities.

About the author

Dr Bill Endres is Assistant Professor at the University of Kentucky, affiliated with the department of Writing, Rhetoric and Digital Studies. He is a visual rhetorician and digital humanist, and his research focuses on illuminated manuscripts made in the British Isles between 600 and 850 CE. His research agenda has three main focuses: digitizing manuscripts, exploring

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digital representation, and studying how early medieval monks organized visuals and invented conventions for images and text to interact dynamically and portray knowledge. Dr Endres has published on the Book of Kells and 3D representation, and the Chronicle of Higher Education has covered his work. His website "Manuscripts of Lichfield Cathedral" (lichfield.as.uky.edu) allows visitors to view the first 3D renderings of an illuminated manuscript on the Web.

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1. Introduction

In 2010, I had the privilege of digitizing Lichfield Cathedral's 8th-century gospel-book, the St Chad Gospels. The St Chad Gospels (Fig. 1) is one of the most significant illuminated manuscripts to survive in the British Isles: it is considered a national treasure. However, the

Figure 1. Luke's Portrait Mark's Incipit

Lichfield community considers it to be far more important than a cultural heritage artifact. This great gospel-book connects the Lichfield community to its founding in the 7th century. As Lichfield Cathedral's Canon Chancellor Pete Wilcox explains, 'One of the things that makes it so precious to us is it unites us to our patron. [...] There is only a cathedral in Lichfield because of St Chad, and this artifact links us within a generation to Chad' (Howard, 2010).

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Indeed, a sacred artifact that unites a community with its founding saint is a treasure. Such an artifact generates a centrifugal force far greater than most historical artifacts. The St Chad Gospels' material presence contains the community's originating energy. This energy has sustained itself over the last thirteen hundred years—through Viking invasions, the gospel-book's likely theft, the Anglican Church's twice separation from the Roman Catholic Church, civil wars, world wars, and economic downturns. Its presence represents what it means to maintain a Christian community through centuries of struggles.

In contrast, academics value sacred artifacts for their contributions to the larger intellectual and artistic history of a people. This value is emphasized by labels such as *cultural heritage artifact*, a concept that originates from the United Nations Educational, Scientific and Cultural Organization (UNESCO) and its convention of 1972. This designation detaches a sacred object from its immediate community and resituates it within the context of world culture and history, and suggests that rights to an artifact belong to all human beings. As a consequence, when digital scholars justify their projects through designations like *cultural heritage*, the immediate community's concerns and needs tend to become relegated to a secondary status.

This study explores what happens when a scholar approaches digitizing a historic and sacred artifact from the perspective of a digital ethnographer: as a present-day cultural phenomenon inseparable from its local context. Such a perspective reverses the impetus that generally motivates digital efforts: it puts the community first. By doing so, such an approach invites ethnographic ethics to become a transforming force for digital scholarship, building upon a call in the digital humanities (DH) for an “ethical turn”. Ethnographic ethics can contribute to such an “ethical turn”, providing insights to guide digital scholars' interactions with a community, opening communal knowledge to a project, and avoiding opportunistic ventures that produce uninspired scholarship and fall well short of a community's needs.

2. Digital Scholarship and an Emerging "Ethical Turn"

DH has yet to engage in a larger conversation about ethics (Spiro, 2012; Svensson, 2010a), prompting Jamie Bianco (2012) to call for an “ethical turn”. This is not to claim that DH scholars have acted unethically. Traditional disciplinary ethics regularly guide digital activities that fall under the umbrella term “digital humanities”. However, digital activities regularly fall

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outside the realm of a traditional discipline's previous reflections on ethical actions. For example, the Statement of Professional Ethics by the Modern Language Association (2014) has little to do with digital scholarship and what makes DH distinct, such as its focus on interdisciplinary collaboration and research activities beyond the university (Terras, Nyhan and Vanhoutte, 2013). Likewise, the MLA Guidelines for Evaluating Work in the Digital Humanities and Digital Media are silent on ethical practices for interdisciplinary collaboration and engaging communities outside academia when pursuing digital scholarship. Furthermore, methodologies like crowdsourcing (Causer and Wallace, 2012; Doan, Bamakrishnan and Halevy, 2011; Blanke, Hedges and Dunn, 2009; Brabham, 2008) reverse longstanding academic notions of the scholar as expert who generates specialty knowledge and disseminates it. Statements of ethics have little chance to stay up with an evolving DH that promotes paradigm shifts in scholarly identity and practices yet has difficulty in defining itself (Terras, Nyhan and Vanhoutte, 2013; Gold, 2012).

Bianco's call is twofold. First, Bianco calls for scholars of DH to examine the power dynamics that have emerged within the burgeoning field, dynamics that remain relatively unscrutinized. She does not accept Tom Scheinfeldt's (2010, p. 59) claims of DH's "niceness" and the field's scholars as 'the golden retrievers of the academy.' For Bianco (2012, p. 97), the dynamics of power within DH need to be interrogated—particularly when DH computer code and computational methods 'operate through a web of politics, people, institutions, and technics in a network of uneven, albeit ubiquitous, relations.' Bianco's call supports scholarly inquiries like Tara McPherson's (2012) "Why Are the Digital Humanities So White? Or Thinking the Histories of Race and Computation."

Second, Bianco calls for creative critique as a digital and ethical practice for DH. She views this approach as exposing the power dynamics of code and computational methods, adding a layer of transparency to digital scholarship. For her notion of creative critique, Bianco (2012) draws on the digital art of Sharon Daniels, who uses critical theory as a dimension in her artistic expression. Daniels' (2007) "Public Secrets", which explores women in prison, has inspired discussions about the role of academic activism in DH (Svensson, 2010). For example, Alex Juhasz (2009), also inspired by Daniels' work, views the digital as 'what was needed to push more scholars to engage with the personal and political implications of their practices', a slow transition that he had already perceived happening in traditional scholarship.[1]

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I wish to answer Bianco's call in a slightly different manner. Operating through Willard McCarty's (2005) notion of DH as a "trading zone", [2] I want to borrow from ethnography's rich tradition of scholarly thought about ethical principles when engaging communities to produce research (Jones and Watt, 2010; Atkins et al., 2001; Hammersley and Atkinson, 1995). I want to use this knowledge to inform digital scholarship on sacred artifacts. McCarty recognizes that DH has always operated *de facto* ethnographically; I wish to make this *de facto* operating more mindful and productive.

From years of experience and reflection on research in communities, ethnographers have developed ethical principles to guide their activities (Jones, 2010; Brunt, 2001; Degan, 2001; Faubion, 2001; Macdonald, 2001). These principles informed my digitization of the St Chad Gospels and can productively inform other digital projects with sacred artifacts. By design, ethnographic ethical principles help ethnographers to think through issues connected to varying social contexts, research agendas, methods, and outcomes (Jones and Watt, 2010; Atkins et al., 2001; Hammersley and Atkinson, 1995). They protect the interest of a community, but they also protect and promote the integrity of research and its outcomes (Jones and Watt, 2010; Atkins et al., 2001; Hammersley and Atkinson, 1995). By tapping ethnography's rich tradition of engaging communities to produce research, digital scholars have an opportunity to take advantage of already established disciplinary knowledge. Such knowledge, rethought in a digital context, provides digital scholars with insights into structuring projects, a means to think through complex social situations, and a metrics to inspire project outcomes—irreplaceable for honoring a sacred artifact as a present-day cultural phenomenon.

Such borrowing from the realm of ethics has already begun. Digital scholars have leveraged feminist ethics to gain insights for re-inventing digital practices and outcomes. Working from feminist theory, scholars are asking if it is enough simply to curate women's writing and build digital archives (Wernimont, 2013; Earhart, 2012; Flanders and Wernimont, 2010; Roundtree, 2009). For instance, working from Ellen Rooney, Jacqueline Wernimont argues that digitally archiving women's writing requires an intervention. Wernimont (2013, para. 5) states, 'Editing everything won't move us much further along in the effort to end oppression of women if we don't use those editorial opportunities to recenter the role of women's writing in historical and contemporary debates about gender, sex, ethics, and the social dynamics of power.' By mobilizing feminist ethics, Wernimont (2013, par. 11-15) is able to rethink the

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archive and propose strategies for using "interpretive markup" to address longstanding issues related to women writers being left out of larger historical and cultural debates. Feminist scholars are demonstrating the importance of employing ethics to question historical values that otherwise become embedded in archives and perpetuated by DH. Ethical questions fold easily into DH's rich tradition of building as thinking, making such building more dynamic and truly transformative (Drucker, 2009).

Jacqueline Wernimont demonstrates how feminist ethics can inspire innovation, asking scholars to respond to the world before them. However, some scholars in DH, like Lisa Spiro (2012), believe pursuing a statement of ethics is too restrictive. Spiro argues for a statement of *values*. Her reasoning is that ethical guidelines limit and prescribe behaviors. Spiro (2012, p. 17-18) believes DH 'needs a values statement to articulate its mission', create a coherent identity, and set priorities for the burgeoning field.

However, ethical principles are not necessarily restrictive. Their main demand is presence. They function as a tool to think through implications of this presence, situated within a specific social context and motivated by a specific research agenda. These principles can do for digital scholars what they have done for ethnographers: guide interactions, protect the interests of a community, promote long-term relations, facilitate innovation, protect the integrity of research, and transform outcomes (Jones and Watt, 2010; Hammersley and Atkinson, 1995).

3. An Ethnographic Ethical Frame: Principles to Guide the Demands of a Sacred Artifact's Context

Addressing ethics does not necessarily mean generating a rigid ethical code. Martyn Hammersley and Paul Atkinson (1995, p. 277) point out that 'legitimate action on the part of researchers is necessarily a matter of judgment in context.' For such judgments, ethical principles are needed that function like heuristics. To make their point, Hammersley and Atkinson (1995, pp. 275-278) discuss informed consent within four different approaches for judging actions: actions defined as ethical or not; action judged in context; actions judged relative to the values held by the researcher (relativism); and ethics defined as irrelevant to certain types of research.

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Because the nature of informed consent required for research can dramatically vary, depending upon what is being studied and its community, Hammersley and Atkinson (1995) show that judgment in context is generally the most productive approach to determine ethical action. For example, studying racial harassment within a repressive regime will likely require a different level of informed consent than studying members of a democratically elected government (Hammersley and Atkinson, 1995, p. 278). Julie Scott Jones and Sal Watt (2010) take a similar position in *Ethnography in Social Science Practice*, with the slight difference of describing ethical judgment originating out of a cultivated ethnographic sensibility. While ethics can take the form of prescribed standards (first and last scenarios), the complexities of social interactions and their context require flexibility; otherwise, potential harm to participants becomes an increased possibility and the integrity of the research is compromised.[3] On the other hand, ethical relativism is rarely an acceptable position for a field (Brown and Dobrin, 2004).

Elizabeth Murphy and Robert Dingwall (2001) mention one further benefit for using ethical principles over ethical codes: their relationship to research methods. Methods affect the research and participants, needing consideration in any discussion of ethics. As Murphy and Dingwall (2001, p. 340) point out, stringently adhering to ethical codes 'may not give real protection to research participants but actually increase the risk of harm by blunting ethnographers' sensitivities to the method-specific issues which do arise'. To act ethically and protect participants, scholars need constantly to assess the dynamics of their research *in context* as it unfolds. Ethical principles cultivate presence and sensitivities to these interactions. Hammersley and Atkinson (1995, p. 23) remind scholars that 'research [in communities] cannot be programmed, that its practice is replete with the unexpected'.

To address judgments in context, ethnographers divide ethics into two types of principles: deontological and consequential. Deontological principles focus on inherent rights, and consequentialist principles focus on outcomes (Murphy and Dingwall, 2001). The inherent rights of deontological principles normally include privacy, self-determination, and justice—where justice refers to treating research participants equally (avoiding favoritism).

Privacy and self-determination come into play with informed consent and covert research. In what can seem the most innocent research, questions emerge about how much information to divulge when gaining consent. Information can have unexpected and negative consequences. For instance, an ethnographer found that research designed to improve health care

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for a disabled child became difficult after information was given for informed consent, because parents became obsessed with proving themselves to be good parents rather than revealing needs in social service (Murphy and Dingwall, 2001, pp. 342-343). Social dynamics make research in communities full of unanticipated events, and ethical principles are needed to guide thinking and generate productive counteractions as research unfolds.

Consequentialist principles have the most to offer digital scholars. Focusing on the outcomes of research in a community, these principles cover doing no harm and beneficence (reciprocity) (Murphy and Dingwall, 2001; Skeggs, 2001; Hsu, 2014). Harm can usually be recognized, but beneficence has a substantial range. While digital projects often claim that digitally preserving a sacred artifact is inherently an identifiable benefit for a community, such a claim is not self-evident. For example, if digital images are stored in an archive and the only way to view the images is visiting the archive, then beneficence is minimal at best.

An example of beneficence is found in the research of digital ethnographer Wendy Hsu (2014). She studied Asian American musicians and their uses of social media to promote their bands. Hsu became intrigued by one particular South Asian American punk band. In studying their social media exchanges, she generated a map of global communities in which the band had strong following. She shared this research and her map with the band, engaging in an act of beneficence. Hsu (2014) states, ‘My gift in exchange for the band's time spent with me, in this case, was marketing analytics that displayed evidence of their global following.’

Bronislaw Malinowski, considered by many to be the father of ethnography, once wrote, ‘Preconceived ideas are pernicious in any scientific work, but foreshadowed problems are the main endowment of a scientific thinker’ (qtd. in Hammersley and Atkinson, 1995, p. 24-25).[4] Ethical principles are a way to use experience and reflection to provide scholars with a sense of foreshadowed problems. For a digital project, the foreshadowed problem of beneficence is how the digitized materials will meet the needs of an artifact's community. Such a question invites contemplation, conversations, and attention to communal needs. Finding answers to the question, however, can transform digital projects and their outcomes.

4. Epistemology and Respect

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Before I turn to my digital project with Lichfield Cathedral, a note on epistemology is needed. In many ways, traditions of learning within spiritual organizations generate correspondences that can encourage a digitization of a sacred artifact. Many religious communities, including Lichfield, have leaders with advanced degrees. In the Anglican tradition, some of these church leaders have become leading experts on the items in their cathedral libraries, like Dean H. E. Savage of Lichfield Cathedral's work on the St Chad Gospels. The digital humanities actually began with scholarship on sacred texts, when in the 1940s Father Roberto Busa approached Thomas Watson of IBM to discuss using computers to generate a lemmatized concordance for the writings of St Thomas Aquinas (Hockey. 2004).

However, these correspondences do not preclude tensions between academic and religious communities. Differences in epistemology, values, and goals can generate differing perspectives. The modern day university had its origins in the scientific revolution of the Enlightenment. During this period, people reacted against the powers of the Church and its control over culture and knowledge. To free intellectual activity from this control, the Enlightenment turned to individual rationality, authorizing people and their use of reason to generate and validate knowledge (Pagden, 2013; Edelstein, 2010). Such a staunch belief in the individual and reason stood in stark contrast with a religious, community-based epistemology, one centered in faith and tradition. While neither academia nor religions are the same today as during the Enlightenment, these legacies continue in various forms and awareness of potential differences in interests is needed.

Complicating matters, two further epistemic tensions exist within academe. First, traditional humanities scholars have been skeptical of digital humanists, concerned that positivistic epistemologies based on mathematical models shape the scholarship and rob it of significant context that defies numerical representation. According to these critics, humanistic knowledge demands critical thought and interpretation (Ramsay, 2005; Edwards, 2012). While at first this appears a valid critique, it does not recognize that critical thought and interpretation make interventions at various places within any kind of scholarship. This current essay argues for one such intervention, the need for ethnographically-derived ethical principles to be included as part of the critical framework for digital projects.

Second, digitization can be viewed as an act of violence, converting sacred manuscripts into numbers, bits and bytes, *0*s and *1*s. A digitized sacred manuscript is no longer a sacred

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manuscript: it is a dataset. This is the method of positivism and objectivism, demanding that knowledge be derived from logic and mathematics, information that can be objectified. But this is also the moment for a humanistic intervention, to understand what of the culture needs to be re-inserted into the process and product. What is lost or transformed when a sacred artifact is converted into *0*s and *1*s and rematerialized on the screen?

A digital version of a sacred artifact needs its community. It needs to be honored as a cultural heritage item but viewed as a present-day cultural phenomenon, inseparable from its local community. Its cultural heritage designation is just one facet of its identity. This attitude restores the artifact to its status as a living presence, as something vibrant within a community. Maurice Merleau-Ponty (1993, p. 121) warns, 'Science manipulates things and gives up living in them.' Ethnography and its ethical principles keep the community in a digital humanities project, and they keep the relationship between people and artifacts alive.

5. The Lichfield Cathedral Community and Its Sacred Artifact

Situated in the English Midlands, about two hours north of London by train and about fifteen miles north of Birmingham, Lichfield is a city of approximately 32,000 people (Lichfield City Council, 2011). Once the ecclesiastical center for the powerful medieval kingdom of Mercia, Lichfield has slipped into relative obscurity. In modern times, routes chosen for major modes of transportation bypassed Lichfield, beginning in the eighteenth-century with canals and followed by nineteenth-century rail and twentieth-century motorways.[5] Lichfield has relied economically on the industrial base of Birmingham. However, Birmingham and the Midlands suffered from an economic downturn in the second half of the twentieth century, with industrial jobs leaving the area (Crafts and Woodward. 1991).

In 2009, Lichfield regained international attention. Approximately four miles from Lichfield Cathedral, Terry Herbert unearthed pieces of what would turn out to be the largest Anglo-Saxon hoard ever found (Mercian Trail Partnership, 2014). The hoard contains more than 3,500 items and includes religious artifacts such as gold crosses, as well as items used for war, like sword hilts decorated exquisitely with gold and inlaid garnets. The hoard reminded the world of Lichfield's past prominence, when the Midlands and beyond were ruled by powerful

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kings such as Penda, Offa, and Æthelbald, who gained control of London (Brown and Farr, 2005).

Around 730 CE, about fifty years after the hoard's estimated burial, monks made the St Chad Gospels (Brown, 2008; Stein, 1980; Alexander, 1978). It is a Latin gospel-book, containing the complete gospels of Matthew and Mark and the beginning of Luke. The remainder of Luke and the whole of John appear to have been in a second volume, likely lost either during the sixteenth-century reformation or seventeenth-century English Civil War (Savage, 1915). The namesake of this great gospel-book, St Chad, served as an early bishop of Mercia (Bede, 1969). When named bishop, he moved his episcopal see to Lichfield, establishing the medieval city as a significant Christian center (Brown and Farr, 2005; Bede, 1969). Upon St Chad's death in 672 CE, the city became a destination for pilgrims (Brown, 2007; Bede, 1969). Bishop Hedda built a new church in 700, likely to accommodate St Chad's shrine and these pilgrims. The St Chad Gospels was perhaps made to honor St Chad, just as the Lindisfarne Gospels had been made to honor St Cuthbert (Brown, 2007; Henderson, 1987).

While the place of the St Chad Gospels' making is subject to debate, a preponderance of evidence supports Lichfield. However, the St Chad Gospels' past is filled with uncertainty. It spent some of its early years in Wales. How it arrived in Wales is a mystery, but it likely was stolen for the precious metals and jewels that decorated its cover, the manuscript discarded once the cover was removed (Brown, 2007; James, 1996; Savage, 1915). As recorded in the Annals of Ulster, the ninth-century Book of Kells suffered a similar fate (Bambury and Beechinor, 2000). The theft of the St Chad Gospels' cover would explain why the preliminary materials are missing and why the first surviving page is the opening of Matthew's Gospel, the page worn in such a manner as to suggest that it served a substantial time as the manuscript's front (Brown, 2008). Furthermore, the surviving volume of the St Chad Gospels ends with Luke 3:9, an unusual place to intentionally divide a gospel-book.

Marginalia chronicle the St Chad Gospels' time in Wales. These marginalia contain the oldest surviving examples of Old Welsh writing, including one entry recording Gelhi trading his best horse for the manuscript and presenting it to the church of St Telio at Llandeilo Fawr (Brown, 2008; Jenkins and Owen, 1983; Stein, 1980; Alexander, 1978). In the tenth century, the manuscript returned to Lichfield, again under unknown circumstances. Perhaps when the manuscript was stolen and the cover torn loose, part of the manuscript was discarded near

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Lichfield and the Cathedral recovered it, providing evidence of ownership. When relations improved between Wales and Mercia, perhaps such evidence helped to secure the first half of this great gospel-book's return (Savage, 1915).

In the past, the Old Welsh marginalia encouraged scholars to consider a Welsh origin for the manuscript (Scrivener, 1887; Dafydd Jenkins and Morfydd Owens have made rare later arguments for a Welsh origin (1983)). However, other substantial evidence makes this possibility unlikely. The entry about Gelhi trading a horse for this great gospel-book suggests that the manuscript was stolen—otherwise, it would not have been in secular hands (Brown, 2007; James, 1996; Savage, 1915). Also, connecting the St Chad Gospels to Northumbria (upper Northern England) and Ireland are its decorative correspondences with the Lindisfarne Gospels, Durham Cassiodorus, and Book of Kells (Brown, 2008; Henderson, 1987; Stevick, 1986; Stein, 1980; Savage, 1915). The first three bishops of Mercia were Irish, and St Chad spent time studying in Ireland on suggestion from his mentor, Aidan, the Irish monk who was the first Abbott at Lindisfarne (Brown, 2007; Bede, 1969; Savage, 1915). Likewise, St Chad reflects Lichfield's strong bonds with Northumbria: St Chad was born there, studied at Lindisfarne, and later served as Bishop of York before being named Bishop of Mercia (Bede, 1969).

In 2003, with the discovery of the Lichfield Angel, the possibility of a Welsh origin for the St Chad Gospels diminished further. The Angel likely constructed part of the shrine that housed St Chad's bones. Its color palette mirrors that of the St Chad Gospels, a color palette unique amongst surviving insular gospel-books (Brown, 2007).

While a Welsh origin is unlikely, sacred artifacts are like beloved children, whether adopted or not. In Wales, the St Chad Gospels is still cherished and an indelible part of Welsh history, recording medieval life at Llandeilo Fawr in its marginalia and inspiring Welsh religious and artistic practices.

6. Entry Story

In 2009, I visited Lichfield Cathedral to study the St Chad Gospels. This great gospel-book had never had a printed facsimile made, so its study required a visit to Lichfield Cathedral Library. Both the Canon Chancellor, the Revd. Dr. Pete Wilcox, and the Cathedral librarian, Pat Bancroft,[6] thought that the Cathedral had digital images for nearly the whole manuscript from

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the St Chad Gospels' loan to the British Library in 2003. They planned to set me up on a computer with the images, since conservation practices limited access to the manuscript. However, the British Library had photographed only targeted pages for a version of the St Chad Gospels for its *Turning the Pages* software, which emulates the turning of a page on a computer screen or kiosk. These images are inseparable from this application, so I arrived at Lichfield to learn that the Cathedral did not have high-resolution images for the St Chad Gospels.

However, Mrs. Bancroft could supply me with 6" x 8" black and white photographs. The Cathedral had these photographs from Roger Powell's rebinding of the manuscript in 1962. I spent prolonged hours sitting on a hardwood chair, hunched over, and regularly peering through a magnifying glass, working through the 236 images. I took copious notes, gathering information for my research. Little did I know that I was demonstrating the need for scholarly access to high-resolution images of the St Chad Gospels (Howard, 2010, p. A8). Furthermore, I was being interviewed for my digital project by Mrs. Bancroft and Revd. Dr. Wilcox. My time in that hardwood chair was testimony to my commitment to and relationship with the St Chad Gospels, a relationship different from that of the members of the Cathedral community but a relationship all in the same. This relationship was the building of my trust relations with the Cathedral that would lead to my digital work.

7. Beneficence in Digital Work and My Project at Lichfield Cathedral

Lichfield Cathedral had five desired outcomes for digitizing the St Chad Gospels, each having a different relationship to the ethnographic principle of beneficence:

- Increase access and study of the St Chad Gospels
- Acquire color photographs of the whole manuscript
- Determine how well the St Chad Gospels is aging
- Recover any erased text on page 141 (perhaps information about provenance)
- Digitally preserve the photographs in a digital archive

From a digital humanities' perspective, beneficence seems nearly automatic for a digital project like mine: access to the St Chad Gospels was limited as part of its conservatory strategies.

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Furthermore, supplying the Cathedral with digital images for the complete St Chad Gospels easily appears a benefit for the community.

However, high-resolution images generate their own complications. While digital photographs provide access for scholars and members of a community to explore a sacred artifact, technological requirements and expertise can severely restrict digital access. If beneficence is to be an outcome, the sheer size of a dataset and its images must be managed. For the St Chad gospels, I generated over 4,000 files and a half terabyte of data.

This quantity of data is necessary for digital preservation and recovering information from worn, water-damaged or erased areas on pages. One means to recover visual data is through multispectral imaging, photographs taken using different spectral bands of light, from near ultraviolet to infrared. Images captured with ultraviolet and infrared light are adept at revealing information not normally visible to the unaided human eye. Generally, I took photographs using thirteen different spectral bands. However, because ultraviolet light interacts with vellum and darkens it over time, I used ultraviolet light only for pages that required some type of recovery. Therefore, the number of photographs for a page varies from twelve to thirteen. The multispectral images are roughly 90 megabytes (produced with a 39 mega-pixel monochrome camera). With twelve or thirteen images per page, multispectral photographs generate about 1.17 gigabytes of data for each page—the St Chad Gospels has 236 pages.

To produce colored photographs, images taken with red, green and blue bands of light are combined. Human vision is trichromatic, and one trichromatic model for generating colors that humans can see is based upon red, green and blue bands of light. This model is efficient for electronic devices, like digital cameras—thus, the common designation of a color digital photograph as an RGB image. The color images for the St Chad Gospels are roughly 270 megabytes each. Therefore, the dataset for the St Chad Gospels consists of impressively large files that accumulate into a half terabyte of data. To engage this dataset, someone needs a substantial computer and sophisticated graphics editing software.

But part of the rich data for my project also includes 3D images. Prior to the eighteenth century, the St Chad Gospels suffered from water damage, which caused severe cockling (wrinkling of the pages). In 1962, Roger Powell (1965) flattened the pages and rebound the manuscript, but the St Chad Gospels' pages are vellum (calfskin). Nearly thirteen-hundred-year-old vellum is hygroscopic, absorbing moisture readily from the air; therefore, cockling gradually

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returns because any absorbed moisture encourages pages to return to their prior state. In case cockling had returned, I took 3D images so pages could be digitally flattened.

The richness of 3D data also provides further opportunities for preservation and presentation of a manuscript on the Web. For instance, 3D data makes it possible to develop a tool for measuring any aspect of a page. These measurements can be compared in the future to provide valuable information about how the St Chad Gospels is aging. For example, aspects like holes in the vellum can be measured and compared to determine if they are increasing in size and in need of special care. Lost chips of pigment can be measured to assess losses and predict future trends.

For my digital project to meet the ethnographic challenge of beneficence, I needed to transform the way in which access to the data from a digital project is delivered over the Web. This goes beyond supplying Lichfield Cathedral with all of the post-processed images that have been color and exposure corrected, embedded with metadata, logically organized and easily accessible on an external hard drive that works with a British power supply. While this provides the Cathedral with the images to use as they see fit, a cathedral generally does not have the available expertise and resources to present a half terabyte of data on the Web for its community.

In DH, a benchmark for providing images is the Archimedes Palimpsest Project (Netz et al., 2008), a project that involves a secular text overwritten three hundred years later with a liturgical one, the manuscript currently in private hands. The owner of the palimpsest has generously made all of the images available for download, including color and multispectral images. However, downloading and viewing these images requires technical skill, software, and computing power—not to mention the aid of a fast Internet connection. This solution makes sense for the Archimedes Palimpsest Project. Its managers (Netz, et al., 2008) are clear about the project's intent: make its images available for researchers through a “public archive”. Such a means to access images is acceptable for researchers but not for a sacred artifact's community.

To overcome these challenges, I developed and adapted various available technologies. They include what I refer to as an overlay viewer for the RGB and multispectral images for each page, historical image overlays for viewing how the St Chad Gospels is aging, and 3D renderings of sixteen of the St Chad Gospels' pages. This development work would not have been possible without the infrastructure of a university.[7]

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But the technical challenge is only half of the issue of access and beneficence. Intellectual access is also needed. During imaging, I had the unexpected opportunity to engage members of the Cathedral community. A group of members, affectionately known as the "babysitters", signed up for shifts to accompany the St Chad Gospels during its imaging, as representatives of the Cathedral. Each took a two-hour shift, some more than one, sitting in the dark while the LED lighting flashed through its multiple bands of light time and again. During imaging, I had the opportunity to talk with them. They asked questions about the St Chad Gospels, and I pointed out various features and informally interviewed them. I asked them about the Cathedral, the community, and the Staffordshire area. Beyond the enjoyment, these interactions enabled me to connect to community members. I listened to tales of riding ponies in the field where the Staffordshire Hoard was found, and witnessed the joy in the face of Lyneth, one of the "babysitters", when I asked if she would like to hold the St Chad Gospels when technical difficulties required the removal of the manuscript from the book cradle. My interactions gave me irreplaceable insight into the Community's relationship to the St Chad Gospels and the types of questions members had about this great gospel-book.

These interactions directed the design of the website for the St Chad Gospels. They supplied me with insights into the type of information community members would need to explore the great gospel-book more completely. One way I supplied this information was by creating a features section that lists pages for each gospel, major decoration, marginalia, dry-point glosses, and a range of other significant aspects of the St Chad Gospels. Each feature has a link to its page. For access to images, I provide thumbnails for each page, labeled with information about the page's chapter, verses, and features of interest.

8. Overlay Viewer: Organizing and Making Nearly a Terabyte of Data Accessible

If my digitization of the St Chad Gospels was to have benefits for the community at Lichfield Cathedral through the Web, I had to organize the data and make it accessible to members of the community who might not have strong computer skills, a powerful computer, specialty software, or a fast Internet connection. Barriers to access have been a consistent issue with the Web, created by lack of infrastructure, technical expertise, and cost of computers and

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software. Members of the Cathedral community share these issues with a large number of people, including academics. Outside of DH, the research that many scholars engage in does not require substantial expertise with computers, and in the realm of teaching the same holds for many educators.

I share with the Lichfield community the desire for easy access to and use of images. Because I have technical expertise does not mean that I desire to employ it constantly. I wanted a digital presentation of images on the Web that efficiently meets my research and teaching needs as well as those of other scholars.

For example, the value of multispectral images is in overlaying them for comparisons. By overlaying multispectral photographs and adjusting the top image's opacity, a scholar can compare visual information captured by different bands of light – especially those that provide visual information not seen by the unaided human eye. This allows scholars to explore concealed aspects of a manuscript. Beneficence suggests that members of the Lichfield community have the same opportunity as scholars to explore these secrets. Downloading and accumulating roughly fourteen images into a single file for the 236 pages of the St Chad Gospels (using graphics software like Photoshop) is neither practical nor efficient for interested members of Lichfield Cathedral—or for most scholars. Each single file with its fourteen layers would amount to about 1.44 gigabytes.

To solve this problem, I developed an overlay viewer that performs the two necessary functions of organizing the images and making them accessible. On my website for the Cathedral's manuscripts, the nearly four thousand images of the St Chad Gospels are organized at the viewer level. Pages are arranged in chronological order, displayed as thumbnails with the beginning and ending chapter and verse listed for each page. This is an aid to understanding what each page contains, since the St Chad Gospels is in Latin and the insular majuscule script is initially a little difficult to read. When a visitor clicks a thumbnail, the viewer opens with the RGB image. At the top of the viewer, two drop-down lists present selections for any two images of a page, one for overlay, its opacity adjustable through a slide-bar (Fig. 2).

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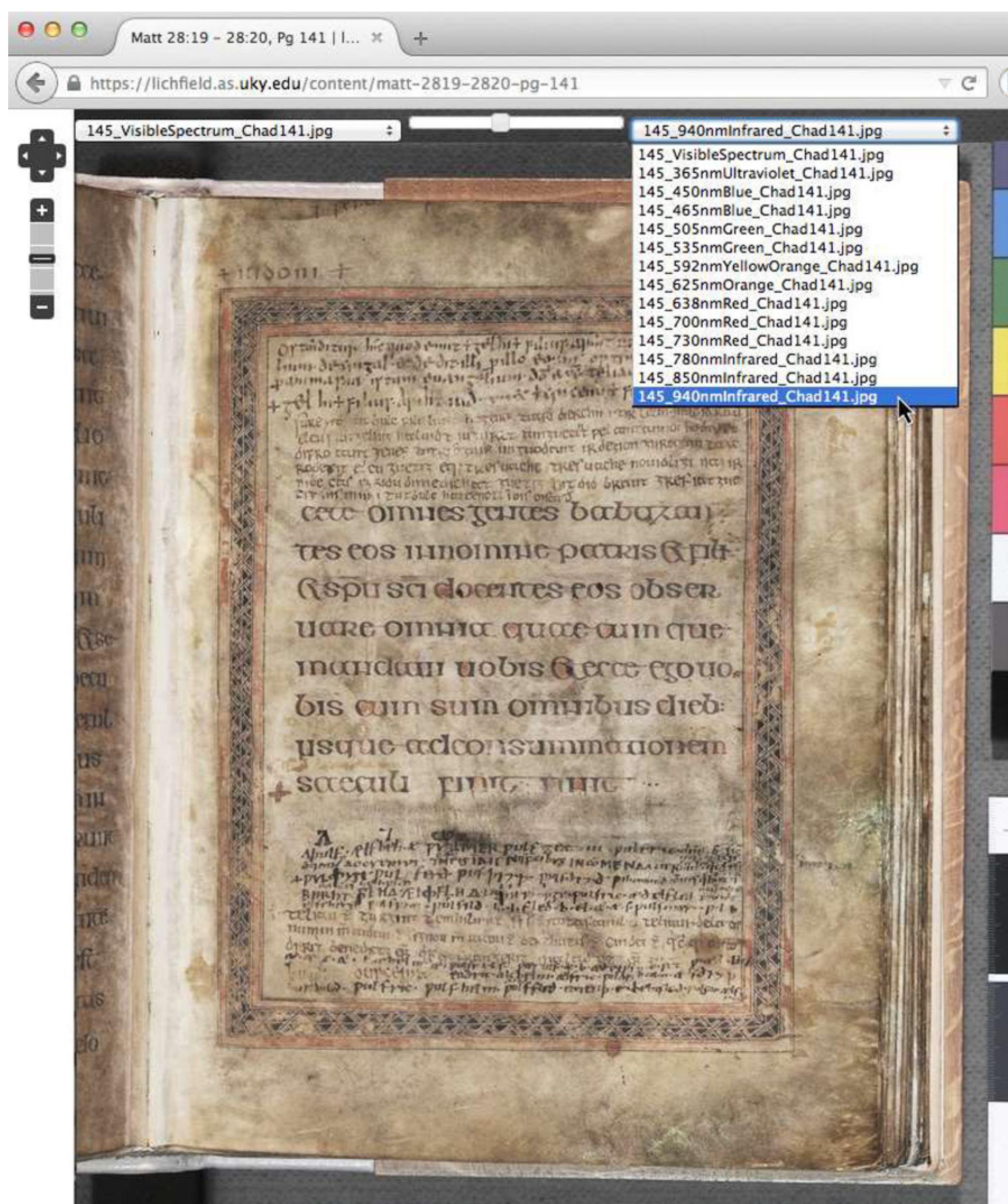

Figure 2. Overlay viewer with drop-down list for selecting images of a page and slide-bar in the middle to adjust transparency of the top image. Page 141 – erasure in middle area.

The overlay viewer allows members of the community to explore pages and possibility recover text, like on page 141. When imaging the St Chad Gospels, page 141 was of special interest to the "babysitters". They were curious as to what this erased area might contain, including whether it would have information that would suggest an origin for the manuscript in Lichfield or Wales. The erased area is below the display script and above the marginalia, where

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smudges appear. Its vellum exhibits areas where a knife seems to have scraped writing from the page. Infrared images allow for a view deeper into the vellum. Ultraviolet darkens areas where any residual ink might remain. Overlaying combinations of ultraviolet, infrared and RGB images and adjusting transparency provide opportunities for recovering any erased text.

Unlike the Archimedes Palimpsest Project, a visitor does not need to download images for a page and use graphics software to combine them into a single file for comparison. My Web viewer performs this function. A visitor simply selects the desired images from the drop-down lists and adjusts the transparency as desired for the top image. The viewer makes nearly 4,000 images for the St Chad Gospels accessible and interactive.

Because bandwidth can still vary for Web access, the viewer automatically loads a mid-sized image, which is 1536 x 2048 pixels, with a smaller image (768 x 1024 pixels) available by clicking the minus sign. A full-sized image is available by clicking the plus sign—full-sized images are 5412 x 7264 pixels. To speed access, images are sliced and loaded in segments of 256 x 256 pixels.

9. Historical Image Overlays

One of the challenges in caring for an early medieval manuscript is managing its preservation. Inks, pigments, and vellum age slowly and subtly. Discerning these subtle changes is difficult if not impossible without exacting visual information and a means to compare this information across time.

Providing information to Lichfield Cathedral about the aging process of the St Chad Gospels generated further beneficence from my digital project—similar to the global map of fans generated by the research of Wendy Hsu (2014) and shared with the Asian American punk band. For Lichfield Cathedral, the St Chad Gospels' aging is of special interest because of its continued but restricted use. The St Chad Gospels is the oldest known gospel-book still serving its original purpose, albeit in extremely limited roles. Up to six times a year, the St Chad Gospels is removed from its climate-controlled case and carried in a procession, such as during Christmas Day Mass (Howard, 2010).[8] While extreme caution is taken and the roles tightly restricted, information about the aging of the St Chad Gospels contributes to decisions about these uses.

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As part of the ethnographic principle of beneficence, information about the aging of the St Chad Gospels is important to balance against the risks taken by the Cathedral in the digitization effort. Ethnographers recognize that a community and/or its members generally assume more risk than the researcher in a research project, and part of the notion of beneficence is to balance any risk taken by a community and its members (Murphy and Dingwall, 2001). For instance, photographing the St Chad Gospels created added opportunities for mishaps to befall the St Chad Gospels. But beyond these risks, imaging places strains on a manuscript. For example, opening a page stresses the cohesion between pigment and vellum—layers of pigment are rigid and vellum is flexible, arching one way, then the other when a page is turned. Imaging increases a manuscript's exposure to ultraviolet light, which damages vellum, slowly and through accumulation. Such stresses were managed and minimalized. Imaging happened in a dark room and used LED lighting that generated only the wavelength of light necessary for any one image. Nonetheless, imaging still added age to the St Chad Gospels, even if aging was minimal and the change unnoticeable. Providing the Cathedral with information about how the manuscript is aging is an important counterbalance for the risks undertaken by the community and the stresses that imaging placed on the St Chad Gospels.

One more risk bears mentioning. Lichfield Cathedral does not receive government funds for support of the St Chad Gospels or its cathedral. When the Cathedral agrees to an imaging project and shares its treasured manuscript, there is no guarantee that it will not hurt the revenue stream connected to it. Residing in the English Midlands, the St Chad Gospels does not have the advantages of a large city, like the ninth-century Book of Kells at Trinity College in Dublin, where drawing visitors is easy. Although some digital humanists and computer scientists claim that digitization leads to wider exposure for a manuscript and to economic gain through visitors and requests for commercial uses, I do not know of any research that substantiates this claim for a cathedral. Any exposure leading to economic gain would depend upon countless variables and circumstances, varying on a case-by-case basis. Simon Tanner and Marilyn Deegan (2012) have done excellent scholarship on the benefits for museums and libraries of digitizing their collections. Unlike Lichfield Cathedral, these institutions usually receive government funding and have large collections that have a variety of possible appeals, but the benefits that Tanner and Deegan identify are still likely to apply in small ways to Lichfield, primarily in the area of ethos rather than financial support. Providing additional ascertainable benefits is a way to meet

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the requirements of the ethnographic principle of beneficence and insure that a Cathedral and its community receive a tangible benefit for their risks.

To gauge how the St Chad Gospels is aging, I researched past photographic efforts, gained access to their photographs, digitized them, aligned them in Photoshop, and compared them. On the *Manuscripts of Lichfield Cathedral* website, I have placed historical images in my overlay viewer for nine of the most significant and telling pages of the St Chad Gospels. The viewer allows a page to be compared across time. The historical image overlays include images from six photographic efforts:

1887 – Photographs published in F. H. A. Scrivener's *Codex S. Ceaddae Latinus*

1911 – Photographs taken under unknown circumstances

1929 – Photostat copy of the complete St Chad Gospels produced by the National Library of Wales, Aberystwyth

1962 – Photographs taken during the St Chad Gospels' rebinding by the Conway Library, Courtauld Institute of Art, London

2003 – Photographs taken by the British Library, London, in a cooperative effort with Lichfield Cathedral and Llandeilo Fawr

2010 – Digital images taken through my efforts with the College of Arts & Sciences and College of Engineering, University of Kentucky

While these earlier efforts were sporadic and only three photographed the whole manuscript, they provide visual information to identify intervals when a change in the St Chad Gospels occurred.

On the whole, the St Chad Gospels is aging well. However, a few pages show trends of pigment loss. One of them is Luke's incipit, page 221. In the historical images, the trend of pigment loss continues from 1911 to the present—areas of loss since 1911 marked with curved brackets (Fig. 3).

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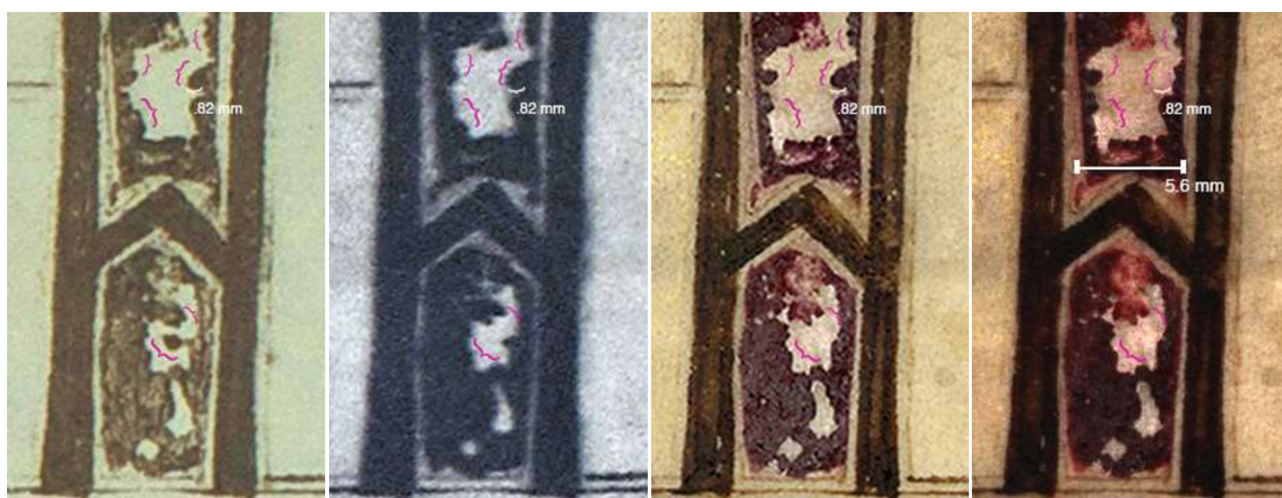

Figure 3. Luke's Incipit, 1911	1929	2003	2010

In the fall of 2014, I digitized further images from another photographic effort. In 1956, the Bildarchiv der Abtei Maria Laach produced color slides for the major decorated pages of the St Chad Gospels. The 1962 photographs from the Courtauld Institute represent the manuscript immediately after the flattening of the St Chad Gospels' pages and before the manuscript was rebound. Therefore, the 1956 slides provide significant visual information for assessing the effects of the flattening. Cockling places stress on pigments as does the flattening process. These images will provide rare information for scholars and conservators about the effects of flattening—not only helping the Cathedral to understand the aging of its beloved manuscript but also helping scholars and conservators understand this process for other medieval manuscripts.

On the *Manuscripts of Lichfield Cathedral* website, I provide further information about trends in the St Chad Gospels' aging. I include an animated gif to show an area where chips of pigment have broken free on Luke's Portrait (see: https://lichfield.as.uky.edu/historical-images).

10. 3D Renderings

One of the most promising new technologies I used to digitize the St Chad Gospels was 3D imaging. As mentioned earlier, I captured 3D data in case cockling had returned and the pages of the St Chad Gospels needed digital flattening. However, the richness of 3D data provides further opportunities for preservation and presentation of a manuscript on the Web. For

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example, because 3D data allows for measuring features of a page, such measurements can be taken and compared in the future to provide valuable information about how a manuscript is aging.

The dynamics of 3D renderings also provide advantages over 2D images for scholarship, teaching, and viewing. 3D renderings introduce new ways to view and encounter a sacred manuscript on the Web. With 3D, any point on a page can become an epicenter around which a page rotates. For instance, traditional Western habits of reading move from left to right and top to bottom—as embedded in scroll bars for Web browsers. But 3D opens new ways of interacting

Figure 4. Chi-Rho – lines of sight as encouraged by reading habits and layout

Figure 5. Chi-Rho – curved brackets mark four triskelia

with and seeing a page of a manuscript. For example, Figure 4 shows the lines of sight generated by Western habits of reading and layout. Traveling left to right, my line of sight follows the *XPI* (first three letters of the Greek word for *Christ*—*chi*, *rho*, *iota*) and the lower three lines of text. Traveling top to bottom, my line of sight is dominated by the *X*, filling the left side of the page. Western culture cultivates a reading from left to right, which then becomes reproduced in various types of artifacts, including books and paintings (Kress and van Leeuwen, 2006).

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In Figure 5, I mark four triskelia, one of which is unique and has been overlooked by scholars—surprisingly so, because this page is one of the most photographed and printed in scholarship on the St Chad Gospels. Triskelia are normally constructed with a three-pronged twirling geometric shape inside (1 through 3), following the Celtic design (Fig. 5). However, triskelion 4 is constructed out of three heads of Anglo-Saxon-styled birds. I did not notice the uniqueness of this triskelion

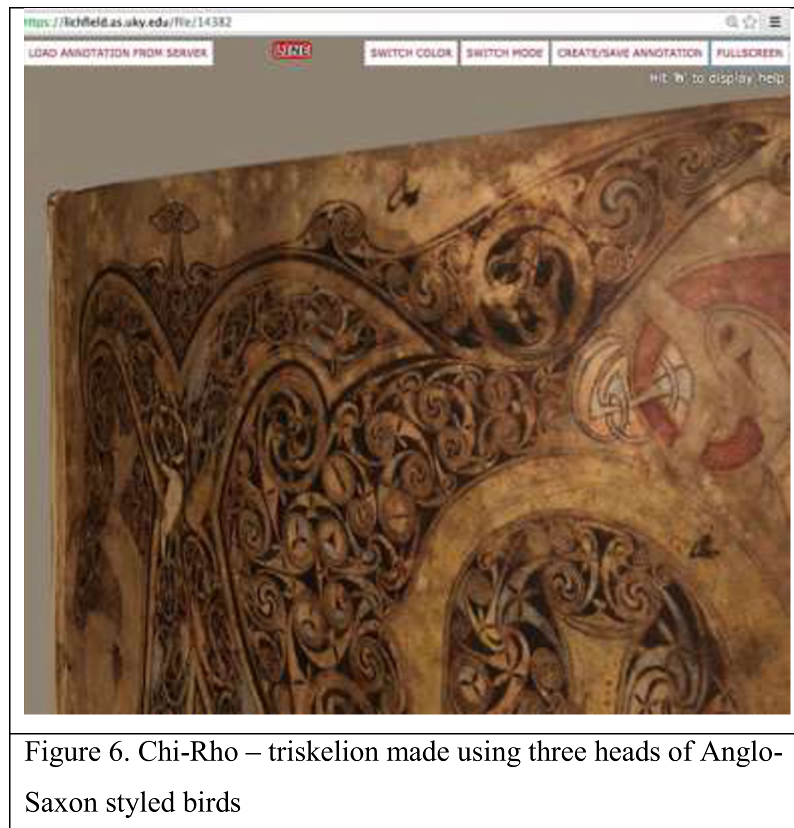

Figure 6. Chi-Rho – triskelion made using three heads of Anglo-Saxon styled birds

until I examined the page in 3D (Fig. 6). I made a point near this triskelion an epicenter from which I rotated the page. The birds are worn, inviting the eye to see them as geometric shapes, as expected. However, 3D invites a different heuristic for seeing, one that encourages scholars to see a manuscript's feature anew, beyond expectations and habits of looking.[9]

I have written elsewhere about my efforts with 3D and its potential for studying manuscripts, examining issues such as digital representation and preservation, interaction, and heuristics of seeing (Endres, 2014). One of the main challenges of 3D is accessibility. However, with the advent of WebGL, major browsers have built-in support, making 3D viable for delivery

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over the Web and without the need for specialty software or downloads. At this writing, Google Chrome and Safari have strong support, with other browsers at various stages of adding it.

My goal for the 3D renderings of the St Chad Gospels are to offer an experience with a digital version of a manuscript that is more dynamic and interactive than is possible with 2D images. To facilitate this interaction and take advantage of 3D's rich data, I designed a number of tools for the 3D gallery.[10] These tools enable a visitor to generate a URL for the exact position that a 3D image is manipulated into (a position that can be saved, sent to a friend or colleague, and used as a citation); zoom in and out, the resolution a healthy 4096 x 4096 pixels; measure any feature of a page, allowing a measurement to be a line or polygon; create and save an annotation that includes a note, measurement, and the position in which a 3D rendering has been manipulated—able to be reloaded later; and manipulate a 3D rendering by panning the camera or performing an alt + left click to make any point an epicenter around which a rendering rotates. The goal of the 3D renderings and digital space is interaction, engagement, and discovery.

To insure that the Cathedral received as much benefit as possible from the 3D data, I converted all of the 3D files into Adobe PDFs. These PDFs are viewable with the free Adobe Reader. Adobe Reader includes a collection of tools, like a measurement tool, which is precise and rivals any specialty software for 3D renderings. In the conversion, Adobe slightly mutes colors. However, PDFs make the 3D renderings quickly accessible and easy to use, requiring one file instead of three (see my video on 3D: http://youtu.be/ebr0HNnNNrs).

11. Concluding Thoughts

Ethnographic ethical principles provide a means to understand and explore the digitization of a sacred artifact, its benefits to the sacred artifact's community, and a project's resulting digital representations of artifact and community. However, ethnographic principles have their greatest value before a digital project begins. They provide insight into the engagement between researchers and a community, requiring that a sacred artifact be viewed as a present-day cultural phenomenon regardless of its past. Ethnographic principles require digital humanists to build a digitization effort around awareness and respect for community members and thoughtful beneficence for the community that will not be negated by technical requirements. One of the most important questions that ethnographic principles require to be

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asked is what level of beneficence is acceptable for a digitization of a sacred artifact. This is a question that must be answered for each digital project, dependent on the sacred artifact's community, the scope of the project and its technical expertise, and the context of the sacred artifact.

I have attempted to demonstrate how ethnography and its ethical principles unfolded in my digital efforts with the St Chad Gospels and its community at Lichfield Cathedral. DH scholars are engaging people outside academe to produce research—in ways beyond their own discipline's reflections on ethics and research. Ethnographers learned long ago the difficulties that occur when scholars engage communities to generate research. Ethical principles are not meant to restrict behavior or limit academic freedom. Instead, they provide disciplinary wisdom, accumulated through reflection on years of experiences. They are designed to facilitate research, guide interactions, and protect communities along with the integrity of research. Ethical principles are needed to transform DH, perhaps more so than digital technologies. They protect and cultivate human relations—the essence of the humanities.

Acknowledgments:

With gratitude to the Lichfield Cathedral community: prior Canon Chancellor Pete Wilcox, Canon Chancellor Anthony Moore, Clare Townsend, Jo Burkinshaw, Alex Nicholson-Ward, Chris Craddock, Simon Ferguson, Diana Arthur, Cheryl Baxter, Anita Caithness, Gary Cox, Margaret Davies, Mary Harris, Adam Johns, Brian Jones, Liz Kendrick, Lyneth Lockwood, Pat Scaife, Arleen Trickett, and Ann Waller (to name a few)—and in loving memory of Pat Bancroft.

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[1] An example of more traditional academic activism in DH is Jim Ridolfo and Bill Hart-Davidson's Samarian Archives project. This project recognizes the diaspora of the Samarian community and its texts. It 'seeks to digitize thousands of ancient, sacred Samaritan texts and make them available to the Samaritan community' (Matrix, 2012; Ridolfo, Hart-Davidson and McLeod, 2010). Also, forthcoming in 2015 will be Jim Ridolfo's *The Digital Samaritan*, Ann Arbor: University of Michigan Press.

[2] Patrik Svensson has borrowed this term from McCarty and put it to good use. See his "The Digital Humanities as a Humanities Project" (2011) and "Beyond the Big Tent" (2012). McCarty credits Peter Galison (1997) for the term.

[3] Hammersley and Atkinson (1995) present references to ethnographic research by different scholars who hold various views on these issues.

[4] For a brief history of ethnography, see "Origins and Ancestors" by Julie Scott Jones (2010) in *Ethnography in Social Science Practice*.

[5] For a map of the English canal system, see UK Government's Maps of Waterways. It shows canals along with other manmade water way: <http://www.waterways.org.uk/pdf/wwwaterwaysmap>.

[6] Pete is now Dean of Liverpool Cathedral. Unfortunately, Pat has passed away.

[7] For technical expertise, I am much indebted to Noah Adler, Director of Research Computation and Application Development for the College of Arts & Sciences at the University of Kentucky.

[8] In 2011, the BBC filmed the Christmas service at Lichfield Cathedral. To view the role of the St Chad Gospels during this service, visit BBC Christmas Day Workshop (only available in Great Britain) <http://www.bbc.co.uk/programmes/b00grzmv/episodes/guide>.

[9] I discuss 3D, its implications in seeing, and its potentials for scholarship in "More than Meets the Eye: Going 3D with an Early Medieval Manuscript" (2014).

[10] For these 3D tools, I am grateful for the talent and expertise of Noah Adler and Justin Hall.

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Bibliography

Alexander, J.J.G., 1978. *Insular Manuscripts 6th-9th Century*. London: Harvey Miller.

Atkinson, P., et al. eds., 2001. *Handbook of Ethnography*. London: SAGE.

Bambury, P. and Beechinor, B., eds. and comps., 2000. *The Annals of Ulster*. Corpus of Electronic Text, University College Cork, Ireland, [online] Available at http://www.ucc.ie/celt/online/T100001A/ [Accessed 26 November 2014].

Bauer, J., 2011. "Who You Calling Untheoretical?" *Journal of Digital Humanities* 1(1), [online] Available at: https://journalofdigitalhumanities.org [Accessed 22 November 2014].

Bede, 1969. *The Ecclesiastical History of the English People*. McClure, J. and R. Collins, R. eds. 1994. Cambridge University Press, Cambridge.

Bianco, J., 2012. "This Digital Humanities Which Is Not One." In: Gold, M., ed. 2012. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press. pp. 96-112.

Blanke, T., Hedges, M. and Dunn, S., 2009. "Arts and Humanities E-Science: Current Practices and Future Challenges." *Future Generation Computer Systems*, 25(4). pp. 474-480.

Brabham, D., 2008. "Crowdsourcing as a Model for Problem Solving: An Introduction and Cases." *Convergence: The International Journal of Research into New Media Technologies*, 14(1), pp. 75-90.

Brown, M., 2007. "The Lichfield Angel and the Manuscript Context: Lichfield as a Centre of Insular Art." *Journal of the British Archaeological Association*, 160(1), pp. 8-19.

Downloaded from Brill.com04/06/2021 12:40:05AM
via free access

Brown, M., 2008. “The Lichfield/Llandeilo Gospels Reinterpreted.” In: Kennedy, R. and Meecham-Jones, S. eds. 2008. *Authority and Subjugation in Writing of Medieval Wales*. New York: Palgrave MacMillan. pp. 57-70.

Brown, M. and Farr, C., 2005. *Mercia: An Anglo-Saxon Kingdom in Europe*. London: Continuum.

Brown, S. and Dobrin, S., 2004. “New writers of the Cultural Sage: From Postmodern Theory Shock to Critical Praxis.” In: Brown, S. and Dobrin, S., eds., 2004. *Ethnography Unbound: From Theory Shock to Critical Praxis*. Albany: State University of New York Press. pp. 1-10.

Brunt, L., 2001. “Into the Community.” In: Atkinson, P. et al. eds. 2001. *Handbook of Ethnography*. London: Sage. pp. 80-91.

Causer, T. and Wallace, V., 2012. “Building a Volunteer Community: Results and Findings from “Transcribe Bentham.”” *Digital Humanities Quarterly*, 6(2), [online] Available at: http://digitalhumanities.org:8080/dhq/vol/6/2/000125/000125.html [Accessed 14 November 2014].

Crafts, N. F. R. and Woodward, N. (1991). *The British Economy Since 1945*. Oxford: Oxford University Press.

Daniel, S. (2007). Public Secrets. *Vectors Journal*, 2(2), [online] Available at: http://vectors.usc.edu/projects/index.php?project=57 [Accessed 11 November 2014].

Deegan, M.J., 2001. “The Chicago School of Ethnography.” In: Atkinson, P. et al. eds. 2001. *Handbook of Ethnography*. London: Sage. pp. 11-25.

Drucker, J., 2009. *SpecLab: Digital Aesthetics and Projects in Speculative Computing*. Chicago: Chicago University Press.

Downloaded from Brill.com04/06/2021 12:40:05AM
via free access

Doan, A. and Bamakrishnan, R. and Halevy, A., 2011. "Crowdsourcing Systems on the World-Wide Web." *Communications of the ACM*, 54(4), pp. 86-96.

Earhart, A., 2012. "Recovering the Recovered Text: Diversity, Canon Building, and Digital Studies." Presentation at DH2012 in Hamburg and slightly modified for talk at University of Kansas. [video] 9 Oct. Available at: https://www.youtube.com/watch?v=7ui9PIjDreo [Accessed 14 November 2014].

Edwards, C., 2012. "The Digital Humanities and Its Users." In: Gold, M., ed. 2012. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press. pp. 213-232.

Edelstein, D., 2010. *The Enlightenment: A Genealogy*. Chicago: University of Chicago Press.

Endres, B., 2014. "More Than Meets the Eye: Going 3D with an Early Medieval Manuscript." *Proceedings of the Digital Humanities Congress 2012*, [online] Available at: http://www.hrionline.ac.uk/openbook/chapter/dhc2012-endres [Accessed 5 December 2014].

Fabion, J.D., 2001. "Currents of Cultural Fieldwork." In: Atkinson, P. et al. eds. 2001. *Handbook of Ethnography*. London: Sage. pp. 39-59.

Flanders, J. and Wernimont, J., 2010. "Feminism in the Age of Digital Archives: The Women Writers Project." *Tulsa Studies in Women's Literature* 29(2), pp. 425-435.

Galison, P., 1997. *Image and Logic: A Material Culture of Microphysics*. Chicago: University of Chicago Press.

Gold, M. eds., 2012. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press.

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via free access

Hammersley, M. and Atkinson, P. 1995. *Ethnography: Principles in Practice*. New York: Routledge.

Henderson, G., 1987. *From Durrow to Kells: The Insular Gospel-books 650-800*. London: Thames and Hudson.

James, P., 1996. "The Lichfield Gospels: The Question of Provenance." *Parergon* 13(2), pp. 51-61.

Hockey, S., 2004. "The History of Humanities Computing." In: Schreibman, S., Siemens, R. and Unsworth, J., eds. 2004. *Companion to the Digital Humanities*. Oxford: Blackwell. pp. 3-19.

Howard, J., 2010. "21st-century Imaging Helps Scholars Reveal Rare 8th-century Manuscript." *The Chronicle of Higher Education*, 5 Dec., pp. A8, A10.

Hsu, W., 2014. "Digital Ethnography Toward Augmented Empiricism: A New Methodological Framework." *Journal of Digital Humanities*, 13(1), [online] Available at: http://journalofdigitalhumanities.org/3-1/digital-ethnography-toward-augmented-empiricism-by-wendy-hsu/ [Accessed 28 November 2014].

Jenkins, D. and Owen M., 1983. "The Welsh Marginalia in the Lichfield Gospels, Part I." *Cambridge Medieval Celtic Studies*, 5 (Summer), pp. 37-66.

Jones, J., 2010. "Origins and Ancestors: A Brief History of Ethnography." In: Jones, J. and Watt, S. eds. 2010. *Ethnography in Social Science Practice*. New York: Routledge. pp. 13-25.

Jones, J. and Watt, S. eds., 2010. *Ethnography in Social Science Practice*. New York: Routledge.

Juhasz, A., 2009. "Digital Humanities." *Media Praxis* 17 July [online] Available at: http://aljean.wordpress.com/2009/07/digital-humanities [Accessed 21 November 2014].

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via free access

Kress, G. and van Leeuween, T., 2006. *Reading Images: The Grammar of Visual Design*. New York: Routledge.

Lichfield City Council (2011). *Lichfield City Council: Statistics*. Office for National Statistics – 2011 Census. [online] Available at: <http://www.lichfield.gov.uk/cc-statistics.ihtml> [Accessed 26 November 2014].

Macdonald, S., 2001. "British Social Anthropology." In: Atkinson, P. et al. eds. 2001. *Handbook of Ethnography*. London: Sage. pp. 60-79.

Matrix (2012). "Samaritan Archives Project Receives International Press Attention." *Matrix*, 28 June 2012, [online] Available at: http://www2.matrix.msu.edu/2012/06/samaritan-archives-project-receives-international-press-attention [Accessed 24 November 2014].

McCarty, W., 2005. *Humanities Computing*. New York: Palgrave.

McPherson, T., 2012. "Why Are the Digital Humanities So White? Or Thinking the Histories of Race and Computation." In: Gold, M., ed. 2012. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press. pp. 139-160.

Mercian Trail Partnership, 2014. *Staffordshire Hoard*, [online] Available at: <http://www.staffordshirehoard.org.uk/> [Accessed 5 December 2014].

Merleau-Ponty, M., (1961). "Eye and Mind." In: Johnson, G. ed. (1993). *The Merleau-Ponty Aesthetic Reader*. Chicago: Northwestern University Press. pp. 121-149.

Modern Language Association, 2014. Statement of Professional Ethics. *MLA*, [online] Available at: <http://www.mla.org/repview_profethics> [Accessed 18 November 2014].

Downloaded from Brill.com04/06/2021 12:40:05AM
via free access

Murphy, E. and Dingwall, R., 2001. "The Ethics of Ethnography." In: Atkinson, P. et al. eds. 2001. *Handbook of Ethnography*. London: Sage. pp. 339-351.

Netz, R., et al., 2008. "The Digital Archimedes Palimpsest." *The Archimedes Palimpsest*, [online] Available at: <http://archimedespalimpsest.org/digital/> [Accessed 5 December 2014].

Pagden, A., 2013. *The Enlightenment*. Oxford: Oxford University Press.

Pidd, M., Stubbs, E. and Thomson, C. E., 1997. "The Hengwrt Canterbury Tales: Inadmissible Evidence?" *Occasional Papers*, 2, pp. 61-68.

Powell, R., 1965. "The Lichfield St. Chad's Gospels: Repair and Rebinding, 1961-1962." *The Library*, 10(4), pp. 260-265.

Ramsay, S., 2005. "In Praise of Pattern." *TEXT Technology* 14(2), pp. 177-190.

Ridolfo, J., Hart-Davidson, W., and McLeod, M., 2010. "Balancing Stakeholder Needs: Archive 2.0 as Community-centred Design." *Ariadne* 63, [online] Available at: <http://www.ariadne.ac.uk/issue63/ridolfo-et-al> [Accessed 28 November 2014]

Roundtree, A., 2009. "Simulated Visuals: Some Rhetorical and Ethical Implications." *Digital Humanities Quarterly* 3(3), [online] Available at: <http://digitalhumanities.org:8080/dhq/vol/3/3/000060/000060.html> [Accessed 16 November 2014].

Spiro, L., 2012. "This Is Why We Fight." In: Gold, M., ed. 2012. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press. pp. 16-35.

Scheinfeldt, T., 2010. "Why Digital Humanities Is "Nice."" In: Gold, M., ed. 2012. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press. pp. 59-60.

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Scrivener, F.H.A., 1887. *Codex S. Ceaddae Latinus, Evangelia SSS. Matthaei, Marci, Lucae Ad Cap. III. 9 Complectens*. Cambridge: C. J. Clay and Sons.

Skeggs, B., 2001. "Feminist Ethnography." In: Atkinson, P. et al. eds. 2001. *Handbook of Ethnography*. London: Sage. pp. 426-442.

Stevick, R.D., 1986. "The 4x3 Crosses in the Lindisfarne and Lichfield Gospels." *Gesta* 25(2), pp. 171-184.

Stein, W., 1980. *The Lichfield Gospels*. Ph.D. dissertation, Berkeley: University of California.

Svensson, P., 2010. "The Landscape of Digital Humanities." *Digital Humanities Quarterly* 4(1), [online] Available at: http://digitalhumanities.org:8080/dhq/vol/4/1/000080/000080.html [Accessed 5 December 2014].

Svensson, P., 2012. "The Digital Humanities as a Humanities Project." *Arts and Humanities in Higher Education* 11. pp. 42-60.

Svensson, P., 2012. "Beyond the Big Tent." In: Gold, M., ed. 2012. *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press. pp. 96-112.

Tanner, S., and Deegan, M., 2011. "Inspiring Research, Inspiring Scholarship: The Value and Impact of Digitizing Resources for Learning, Teaching, Research and Enjoyment." *JISC*. Available at: <http://www.kdcs.kcl.ac.uk/innovation/inspiring.html> [Accessed 2 December 2014].

Terras, M., Nyhan, J. and Vanhoutte, E. eds., 2013. *Defining Digital Humanities*. Burlington: Ashgate.

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via free access

UNESCO, 1972. Convention Concerning the Protection of the World Cultural and Natural Heritage, 17 Oct. to 21 Nov. [online] Available at: <http://whc.unesco.org/en/conventiontext> [Accessed 5 December 2014].

Wernimont, J. (2013). "Whence Feminism? Assessing Feminist Interventions in Digital Literary Archives." *Digital Humanities Quarterly* 7(1), [online] Available at: <http://digitalhumanities.org:8080/dhq/vol/7/1/000156/000156.html> [Accessed 11 November 2014].

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