

MEETING THE MEDIEVAL IN A DIGITAL WORLD

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MEETING THE MEDIEVAL IN A DIGITAL WORLD

EDITED BY
MATTHEW EVAN DAVIS,
TAMSYN MAHONEY-STEEL, AND ECE TURNATOR

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INTRODUCTION

MATTHEW EVAN DAVIS, TAMSYN MAHONEY-STEEL, AND ECE TURNATOR

SINCE THE ADVENT of the “New Philology,” medieval studies have been through an era of *renovatio*.¹ In the words of R. Howard Bloch, medievalists have confronted “tradition through renewal, rather than repeal.”² This time of renewal has become a key part of how we have dealt with the realm of the digital: its technologies, tools, and methodologies. In this book, we confront how those researching and teaching the Middle Ages traverse this realm, negotiating the “virtual divide” between the cultural artefacts that they study and the digital means by which they address those artefacts before presenting them to a variety of audiences. Part of this negotiation between digital and non-digital objects or subjects of study involves re-thinking and re-evaluating the ways that currently practicing medievalists develop their professional skills; this in turn will allow our community to reassess the ways in which the next generation of medievalists are educated. Although expressed through the perspective of the contributing medievalists, with their discipline-specific concerns, this book could thus also be perceived as a response to a rapidly evolving academic world. Rather than treating the digital humanities as its own discipline, the chapters in this volume examine it as a maturing methodology that increasingly intersects with field-specific curricula, boosted in turn by an upward surge in job searches looking for scholars who not only know digital tools, but who also, more importantly, understand technology as something other than an application.³

Thus, many of the articles in this book treat the “book form” as one of the successful technologies for delivering texts and images, along the lines argued by Geoffrey Rockwell and Stéfán Sinclair in *Hermeneutica*.⁴ Several directly tackle the issue of the importance of the medium of transmission, questioning whether we can ever separate text or image from the technology that presents or displays them. They characterize the inner workings of both the analogue and digital as transformative and interpretive methods of delivering a text or image each with their own unique affordances, and pose challenging

1 Nichols, “Introduction: Philology in a Manuscript Culture,” 1.

2 Bloch, “*New Philology Comes of Age*,” 1.

3 While we recognize that there is a rhetorical power in the declaration of field status, our belief is that the term “digital humanities” is too broad to be effective. Moreover, there are aspects of what is commonly referred to as “digital humanities”—GIS mapping, for example—that are not represented in this book. The capitalization used elsewhere also makes a claim regarding what digital humanities is and is not that we feel to be ultimately counterproductive. Individual authors within the volume, and the sources they cite, are making their own claims regarding the utility of the title and should be respected as such.

4 Rockwell and Sinclair, *Hermeneutica*, 161.

questions about the exegetical impact of any given medium. Just like the analogue, the digital is embedded and “materializes” in a context, is open to manipulation and exploration, and can fail in interesting ways.⁵ Each in its unique way, the essays in this book explore how digital contexts shape our interpretation of a text or image, taking into consideration both the benefits gained and the limitations thereof.⁶ In doing so, the authors are aware of the tension mentioned in *Hermeneutica* between the development process of a digital tool and writing as a research practice; they aim to avoid, as much as possible, the very real “temptation to interpret only through tools or only through discourse.”⁷ This book is thus a part of a trend towards increased formalization of methodologies in digital humanities and critical approaches toward the digital part of its name, which emphasizes an understanding of the work that goes into the development and design of digital tools and technologies in the first place.

The majority of the essays in this book underscore both the significance of having a technical understanding of the tools used to facilitate digital scholarship as well as the necessity of maintaining a critical distance regarding the ways that those tools intervene in our understanding of the text. Engaged with both digital praxis and critique of digital methodologies, they are influenced by debates about digital humanities that cast a critical look at how its typologies (humanities computing with its insistence on technical knowledge as “DH 1” versus “DH 2” as the typology that does not require technical knowledge—colloquially referred to as “hack” versus “yack”)⁸ developed, and the assumptions that may lurk under such a divide. Adeline Koh’s call for an “expanded genealogy” for the digital humanities that rests on an inclusive and critical formulation of its history, brings into focus the issues of inequality, race, gender, class, ableism, and insists on an opening toward a non-western focused, truly global studies, is a case in point.⁹ Likewise, although none of the essays in this book directly undertake socio-economic criticism of globally networked computational economies we recognize the invaluable, healthy discussions that take place in the areas of critical code studies as well as criticisms of socio-economic networks that rest on the digital’s feigned objective rationality.¹⁰ David Berry emphasizes the “need to explore the historical, philosophical,

⁵ Leonardi, “Digital Materiality? How Artifacts Without Matter, Matter,” argues that it is the uses of the digital that make it material. Even though it may not have physical matter, the digital “materializes” in the ways it is used and applied.

⁶ *Hermeneutica*, 166.

⁷ *Hermeneutica*, 166.

⁸ Ramsay’s article, although no longer available (itself an example of the type of problem many of the articles referenced herein hope to avoid), is an essential source for this distinction. See also Nowviskie, “On the Origin of ‘Hack’ and ‘Yack,’” in the 2016 edition of *Debates in the Digital Humanities* (which is taken from a blog post of the same title), and Warwick, “Building Theories or Theories of Building?”

⁹ Koh, “Niceness, Building, and Opening the Genealogy of the Digital Humanities.”

¹⁰ Zehle and Rossiter, “Meditations of Labor”; Rossiter, “Materialities of Software: Logistics, Labour, Infrastructure [Extended Version]”; Berry and Fagerjord, *Digital Humanities. Knowledge and Critique in a Digital Age*.

theoretical and critical context for particular kinds of the various forms of digital *praxis*,” and it is in this spirit that we hope to provide not just concrete examples of ongoing projects for the medievalist interested in digital scholarship, but a primer in ways to explore the intersection of the digital on topics discussed in these pages.¹¹ We are confident that both seasoned digital medievalists and all interested in digital humanities will find the articles in this book approachable and deem them as valuable contributions to the field of digital medieval studies.

As such, this book signifies not just a collection of tools and methods, but also a move toward values expressed in both the theory and practice of digital humanities, a move that takes its cues from a pedagogy-focused article by Sean McCarthy and Andrew Witmer.¹² In many chapters the underlying emphasis is on the importance of learning holistically: the value of teaching students to understand and use critically the technology that lies “under the hood” not only as a tool or a means to an end, but as a fundamental part of a scholar’s critical apparatus; in short, to move beyond sheer quantification of data and clicking on buttons.¹³ It is also worth emphasizing that even though students may not want to use the technologies or apply the methodologies mentioned in this volume in their own work, others in their field may. Therefore, they should be prepared to assess and respond intelligently to their colleagues’ research, and as digital tools and methodologies become more integrated into the traditional research practices it is becoming increasingly necessary to teach students these skills as part of their training—even if they may in fact end up not using them. It is worth underscoring in this context that several of the essays in the book speak to the importance of combining the use of digital tools and methodologies with traditional close reading techniques.¹⁴ Others explore the meaning of the unique physicalities of the medieval manuscript and how they both are reflected in and differ from its digital analogue.¹⁵ Further, within the framework of digital humanities, the book covers a host of significant issues that the academy and GLAM (galleries, libraries, archives, and museums) institutions face together such as differences in models of information organization, metadata standards,

11 Berry, *Critical Theory and the Digital*, 209.

12 McCarthy and Witmer, “Notes Towards a Values-Driven Framework,” 2016.

13 On the importance of making the assumptions and editorial decisions explicit in the user interface, see, Ruecker, “Interface as Mediating Actor,” 397–407. On programming as a way of thinking, see Montfort, *Exploratory Programming*, 8. In this context, it is equally worth mentioning Berry’s approach to programming beyond “a *skill* for a new economy,” as a means to understand from the inside out the socio-economic hierarchies created by code: Berry, *Critical Theory*, 209.

14 Many of the articles, especially Van Zundert’s conclusion in *Analysis of Ancient and Medieval Texts and Manuscripts*, edited by Andrews and Macé, constitute important precedents. “The Digital Middle Ages: An Introduction,” edited by Birnbaum, Bonde, and Kestemont, was published shortly after the articles for this book were submitted for publication. It also has relevant, valuable contributions.

15 We would be remiss at this point if we did not mention McGann and Shep’s important contributions to these discussions in *A New Companion to Digital Humanities*.

and the reduction in quality, or lossiness, of the connections, commonly referred to as “crosswalks,” built between those standards.

That medievalists are at the forefront of this trend should not be surprising, considering that they have pioneered much of the methodological application of technology in their work, especially in the fields of digitization and textual analysis.¹⁶ As such, this book looks at the intersection between digital humanities, in its many forms, and medieval studies in its equally myriad affordances from the point of view of medievalists who have created digital resources or applied digital tools and methodologies in their scholarship. Text encoding and analysis, data modelling and provenance, and 3D design are all discussed as they apply to western European medieval literature, history, art history, and architecture. Practically speaking, it does so through an examination of four broad topics: stylometric analysis, in particular the version of stylometry championed by Michael D. C. Drout under the term “lexomics,” the intersections of place and space in the analysis of texts, the presentation and display of digital or virtual facsimiles of medieval manuscript texts, and questions of the infrastructure development and project management that underlie any digital project. The chapters themselves, while falling into one of these four categories, often take cues from or speak to elements of the others, so that the book as a whole provides an example of the state of much of medieval studies as practiced digitally today.

William Smith and Charles Butler’s chapter begins the volume by applying computational analysis not in an examination of word usage, but instead to attempt to determine whether a text is poetry or prose. By running lexomic analyses on texts classified as either “Confessional Materials” or “Prayer” in Neil Ker’s *Catalogue of Manuscripts Containing Anglo-Saxon*, the authors hope to identify whether such computationally assisted methods can help to identify genre in a specific genre of prose or poetry. They do so by creating dendrograms, using the statistical software package R, to show the distribution of various previously identified texts. Smith and Butler observe that, using the cluster analysis algorithm, they could detect whether a text was poetry or prose after an initial identification of representative words—“fingerprint words”—one set for the poetry dataset and one for the prose dataset.

Katayoun Torabi, as the title of her chapter suggests, notes that the use of digital tools and methodologies cannot replace but instead must stem from traditional humanities scholarship. By pairing traditional humanistic analysis with computer-assisted textual analysis using the Lexomics and Voyant Tools software suites in the examination of Old and Middle English texts such as *Beowulf*, the *Blickling Homilies*, and the *Canterbury Tales*, Torabi shows that the digital method can refine, affirm, or deny hypotheses, assist in the interpretation of texts, and aid the researcher in discovering patterns of word usage that otherwise remain undetectable. Through her examination of this work, she notes that researchers cannot simply expect the tool to produce results, but must understand computational tools critically, which requires structured training within the field.

¹⁶ See, for example, the introduction by Porter, “Medievalists and the Digital Scholarly Edition.”

In her chapter, Alexandra Bolintineanu discusses the development of a digital comparison tool, entitled Project Paradise, which maps and annotates two late-medieval representations of the Earthly Paradise: the thirteenth-century Hereford mappa mundi (world map) and the fourteenth-century travel memoir *The Book of John Mandeville*. The article focuses specifically on the version of *The Book of John Mandeville* that appears in a British Library manuscript (Royal 17 C. xxxvii). This so-called Defective Version was the most widespread in England. Project Paradise's digital comparison enables Bolintineanu to project textual evidence from the Defective Version against the Hereford map, creating a geo-temporal exhibit that places the mental geography of Mandeville's world on a digital representation of a near-contemporary map of that selfsame geography. This juxtaposition of the two material objects creates a space for Bolintineanu to examine Mandeville's "spatial poetics against close-grained textual and visual evidence." Each Mandeville reference that Bolintineanu notes tracks three strands: first, the Middle English text from British Library manuscript; second, the Old French text from the *Livre de merveilles*, in Christiane Deluz's critical edition, and third, a translation of the Middle English into modern English. Organizing the digital tool in this way allows readers to focus their attention on the British Library manuscript, but at the same time to compare its paradise references to the continental tradition as represented by the *Livre*. The process of developing Project Paradise, argues Bolintineanu, granted insights regarding the creation process of maps such as the Hereford mappa mundi as a series of negotiations and confluences between text-based and spatial narratives.

Jim Knowles's chapter utilizes a combination of traditional scholarship and new digital methodologies to upend the received wisdom that *Pierce the Plowman's Crede* is situated in the urban streetscape of fourteenth-century London. Based first on an analysis of the original evidence linking the poem to London, Knowles notes that the analysis that supported this conclusion is the result of early twentieth-century architectural history intended not to find the location of the fourteenth-century poem, but Shakespeare's sixteenth-century indoor theatre at Blackfriars. What was meant to be a description of the friary is instead taken to be *the* identification of London with the poem by subsequent American Shakespeareans. Having established the dubious provenance of the scholarly argument for a London location, Knowles then connects this scholarship to the three-dimensional models of lost Franciscan and Dominican mendicant houses he created alongside Michal Koszycki in order to underscore what he sees as a "tension ... between the seductive power of technology-driven reconstruction of the past in all its detail ... and a deep discipline-driven scepticism and resistance toward the spectre of empiricism that such projects conjure up in the minds of (some) literary critics." Instead of treating his models as a finished product, he addresses the idea of building digital projects as a thought experiment, which allows for insights that might not have been available otherwise. Furthermore, the models allow students to seek insights, based on a series of guided questions, rather than simply existing as a "reified visible model"—a virtual facsimile treated as though it existed in the physical world.

Matthew Evan Davis's chapter introduces a group of interrelated pieces examining the connections between digital, web-based archives of manuscripts and their physical originals. Davis argues for the importance of the interaction between form and

content: the ways in which content is presented can fundamentally alter a reader's understanding and perception of it. Therefore, rather than simply being a means to an end, without theoretical influence, the platform by which content is delivered is significant. Davis examines this through an analysis of the evolution of the file/folder metaphor in computing, its uptake and transition into the digital world, and the impact of that uptake on both popular and scholarly thinking. As a scholar of medieval literature familiar with digital tools and platforms as well as their histories, Davis moves in his chapter from the general examination of the file/folder metaphor into a description of his work in creating the Minor Works of John Lydgate virtual archive. While other authors—most notably Koivisto, Kopár, and Wicker in the final chapter—emphasize the vast gap between technologists and medievalists on a project level, Davis's chapter underscores the significance of the shortfall in training, and further underscores the need to realize two things: first, that both technologists and scholars make assumptions about the others' areas of expertise that can prove erroneous, and second, that the act of creating digital tools is itself an act of theory-making that influences the direction of the overall project. Scholars, researchers, and instructors should be aware of the implications of both sets of assumptions, and begin to master a level of awareness that will allow them both to work more easily with technologists in articulating their shared vision for a project and to better appreciate the impacts of technology on our interpretation of material artefacts as cultural heritage items.

In her "Encoding and Decoding Machaut," Tamsyn Mahoney-Steel draws attention to the unique existence of the digital edition and highlights its capacity to free the editorial process from the restraints of traditional codex-based editions. Based on her experience working on the TEI-based XML encoding for *Je Chante Ung Chant*, a web-based archive of largely fourteenth-century songs and motets, Mahoney-Steel relinquishes the purported ideal of the digital's capacity for capturing the physical as well as the ideal of creating an edition exactly like the physical in verisimilitude. Instead, she argues that the online version of a text has a life and form of its own that is both unlike and somewhat independent of the material object it claims to "replicate." Not unlike Davis's chapter in the book, Mahoney-Steel writes that a digital edition can, with all the available transcribed variants and their associated manuscript images, appear more holistic than a print edition. However, it cannot claim to capture its sources fully even in an expertly encoded version—the act of moving the data to a new realm changes the context and creates a unique, digital adaptation of the material text. This digital adaptation has a life of its own, which makes the process of encoding art, not craft.

In his chapter, Timothy Stinson considers the concepts of *variance* and *mouvance*, as interpreted by book historians such as Bernard Cerquiglini, Paul Zumthor, and Stephen Nichols in their work editing medieval French texts. Similarly to Mahoney-Steel, Stinson argues that the digital captures the fluidity (*mouvance*) of the text better than the print version, based in part on his work with the *Piers Plowman* Electronic Archive (PPEA) and the *Siege of Jerusalem* Electronic Archive (SJEA). While most, if not all, medieval texts pose manifold complexities to their editors, Stinson argues that "they are in no way as complex as the surviving corpus of *Piers* texts and the editorial cruces that they famously pose," as there are a large number of surviving *Piers* manuscripts with

significant differences in readings as well as various other challenges and eccentricities. He further posits that the collaboratively composed, image-rich, and often anonymous hypertext pages that make up the web have qualities similar to densely glossed and illuminated folios of medieval manuscript culture. Similar to medieval manuscripts, digital editions of texts are therefore inherently fluid in communicating various editorial approaches and in their treatment of variants, or *variance*.

Bridget Whearty's chapter exposes the diligent work necessary to create the descriptive information, or metadata, for medieval manuscripts and other cultural heritage items held in various collections—each with its own preferred nomenclature. The first part of the article focuses on her work on the Digital Manuscript Index, “a multi-institution experiment working toward that dream of a single search portal,” describing how copying and transformation inevitably creates change and sometimes loss in making analogue medieval manuscripts understandable by a computer as well as a researcher. The second section of the article is a detailed analysis of the Corpus Christi College and Stanford University Library's Parker Library on the Web project, honing in on the challenges of reusing data and associated metadata from older projects often made according to former “best practices” that might no longer apply. The final section of the article focuses on the shortcomings of multilingualism in digital humanities when it comes to describing terminology that must be precisely explicated to be understood across various computational platforms and in different institutional environments. Through an examination of the issues involving transforming the Walters Art Museum's TEI-encoded XML into Stanford's local implementation of Metadata Object Description Schema, or MODS, encoded XML, Whearty shows the complications that arise from the encoding of different analogue standards in constituting new digital platforms. The lessons provided by this work show how the needs of institutional partners are foregrounded in the creation of crosswalks, and how in doing so important information can be lost.

In his chapter, Toby Burrows also examines issues regarding metadata with a specific emphasis on representations of provenance in the collection of Sir Thomas Phillips, a now-dispersed private collection of over 40,000 items. He notes that even though manuscript provenance is often included in the manuscript extensions of Machine-Readable Cataloging, or MARC, record metadata for the manuscript, this information is not represented in standard MARC-based online displays. Some online catalogues, such as Harvard University's HOLLIS catalogue, and major research libraries have devised ways to make the provenance information accessible on these standard displays via workarounds such as the inclusion of the term “former owner” separated from the owner's name via a comma—practices that vary from institution to institution. MARC's (possible) successor, the International Federation of Library Associations and Institutions-developed FRBR (Functional Requirements for Bibliographic Records) also fails to provide specific modelling for provenance data. After examining the practices of a number of institutions with large manuscript holdings, Burrows turns his attention to the cultural heritage institutions that contribute to CIDOC (Comité International pour la Documentation Conseil International des Musées) and its data model, the Conceptual Reference Model (CRM), which is used by Europeana. After noting the gaps in the

FRBR/CRM data model, Burrows suggests the use of additional tools, such as Neo4j and nodegoat, to overcome some of the issues in encoding the history of provenance of manuscripts.

As Burrows and Whearty have shown, “translation” between different cataloguing and encoding practices can be a rather complex and at times defective matter. Joseph Koivisto, Lilla Kopár, and Nancy Wicker focus in the final chapter on the complications of “translating” field-specific expertise in project-based collaborations among medievalists, information scientists, librarians, and technologists.¹⁷ The goal of the NEH-funded Project Andvari is to provide an “integrated access to collections of northern European art and artefacts of the early medieval period (fourth to twelfth centuries),”¹⁸ modelled on linked data (LD) architecture. When they first began collaborating, Koivisto was an information school student (currently a systems librarian); Kopár was and remains a professor of medieval literature and historical linguistics, and Wicker was and remains a professor of medieval art history. Other collaborators include the Institute for Advanced Technologies in the Humanities (IATH) at the University of Virginia, as well as individuals in partnering academic and cultural heritage institutions—the so-called GLAM institutions. As Koivisto, Kopár, and Wicker attest in their article, even though rewarding for all involved areas of expertise, the lack of formal training in project development and management skills has the potential to negatively implement the proliferation of valuable digital medieval projects and initiatives in the future.

The second and current stage of Project Andvari aims to produce a functioning platform using data from the British Museum, the Swedish National Heritage Board’s Kringla database, and the Norwich Castle Museum. The paper underscores the need to develop new models of skills and values training for field experts and practitioners in order to advance scholarship, and suggests that Project Andvari can serve as a model for such work. Project Andvari’s collaboration across multiple institutions by individuals with wide and varied sets of expertise poses welcome challenges, requiring the design of physical spaces for these individuals to meet, new methods for training students and faculty, and mechanisms of recognition for scholars who engage with the tools provided. These models, and the ideas incorporated within, have applications well beyond medieval studies.

As evidenced by these chapters, *Meeting the Medieval in a Digital World* reinforces the fact that medievalists have traditionally been at the forefront of digital scholarship, particularly when it comes to the digitization, transcription, and dissemination of virtual facsimiles and cultural heritage items. More importantly, this book shows that the perceived affiliation—where medieval studies is viewed as a source of raw material or an area of application for the field of digital scholarship—operates in the opposite direction. Digital scholarship is the handmaiden of the subject it serves; it is a set of tools and methodologies and a means of interaction that allows scholars to approach their

¹⁷ For a recently published overview of project management among digital humanities practitioners see Siemens, “Project Management and the Digital Humanist,” 343–57.

¹⁸ “About Project Andvari,” www.andvari.org/index.php.

material in innovative ways. General books on digital humanities tend to assume a set of circumstances and relationships between researcher, textual corpora, and physical objects that is not universally the case. Medievalists frequently do not have a representative set of data to mine, as might be the case for scholars of the post-print era, with access to standardized and reproduced texts. Instead, the discussion in this volume is informed by a sensitivity to the evidence of objects, their contexts, and the relationships between them. We hope that this book will broaden the horizons of medievalists considering entering or already happily ensconced in the digital world, while asking digital humanists to challenge their assumptions about the contexts of our objects of study and the tools and methodologies used to approach them.

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Chapter I

STATISTICAL ANALYSIS AND THE BOUNDARIES OF THE GENRE OF OLD ENGLISH PRAYER

WILLIAM H. SMITH AND CHARLES L. BUTLER

ONE OF THE most basic questions in literary analysis, the question of the genre of the text being examined, when applied to the study of Old English literature is also one of the most fraught. Though obviously many texts fall clearly into recognized categories, the corpus of Old English literature also contains many examples of texts that blur the lines between genres. The most obvious case is the line between poetry and prose in Old English, which remains the matter of much scholarly debate.¹ Even within those larger genres, however, the boundaries of more specific textual categories can often be difficult to determine,² raising hard questions about the way both individual texts and groups of texts may have been understood by Anglo-Saxon authors and readers.

Traditional methods of scholarship can offer some answers to those questions, of course. Textual details—the presence of poetic vocabulary and meter in an Old English poem, the use of traditional sermon structure and direct address to an audience in an Old English homily, for example—usually provide some suggestion as to the intended genre of Old English texts. Manuscript context often offers us further clues to the way an individual text may have been perceived. But especially in cases where such details are not clear, it may be useful to employ digital tools that can examine large groups of texts quickly and perhaps discern patterns and differences that would go unnoticed in a more traditional approach.

Michael Drout's work in statistical analysis of Old English poems, an approach that he has termed "lexomics," has demonstrated the effectiveness of digital tools in detecting subtle divisions within an individual text as well as lines of influence between one text and another.³ By examining relative word frequency, Drout's algorithm has successfully recognized the internal division between *Genesis A* and *Genesis B* and identified the portion of the Old English poem *Daniel* that is related to the poem *Azarias*.⁴ Although lexomic methods have been used primarily to identify relationships of sections inside single texts, similar analysis of word frequency has long been used as well to help determine authorship of contested or anonymous works.⁵ This approach has not so far been

¹ For only one notable and recent entry into this long-standing debate, see Bredehoft, *Authors, Audiences, and Old English Verse*.

² See, for example, Battles, "Toward a Theory of Old English Poetic Genres."

³ Drout et al., "Of Dendrogrammatology." The fullest treatment of the lexomic methodology is found in Drout, *Tradition and Influence in Anglo-Saxon Literature*.

⁴ Drout et al., "Of Dendrogrammatology," 307–19.

⁵ See, for example, Burrows, "Questions of Authorship: Attribution and Beyond," and Hoover, "Testing Burrows's Delta." The most significant application of this approach to Old English literature is Gill, Swartz, and Treschow, "A Stylometric Analysis of King Alfred's Literary Works."

applied to questions of genre differences in Old English literature, but it is not unreasonable to suggest that the same kinds of word use patterns that relate to source influence or authorial style might also be discernible in specific genres.⁶

The data at the heart of approaches such as lexicomics is word frequency. While genre definitions certainly cannot be reduced to simple differences in vocabulary, there's little question that the use of specific groups of words and, more importantly, patterns of word use are often common among texts within a specific genre. In Old English, for example, we know that poetic texts often contain markedly different vocabulary when compared to prose texts. Scholars familiar with those differences in vocabulary would likely be able to identify a previously unknown Old English text as an example of either prose or poetry based at least in part on the appearance or non-appearance of individual words. If provided with a list of typically poetic or prosaic words, a computer could do the same, of course. But can a computer recognize the differences between Old English prose and Old English poetry without a predefined lexicon? In other words, are the differences in word use patterns between poetry and prose distinct enough for a computer to recognize those differences and establish reliable boundaries between prose texts and poetic texts? And what happens when we ask that same computer to examine the boundaries around a more specific textual genre, such as Old English prose prayer?

The only systematic attempt to define a corpus of Old English prayers is that represented by the list of texts in the *Dictionary of Old English (DOE)* corpus of Old English.⁷ Perhaps systematic is the wrong word to use here, however, since the *DOE* offers no rationale for including or excluding an individual text from the category of prayer. That category, represented by Cameron number B12.4, includes only twenty-four individual prayers (technically twenty-five, since two alternate versions of the Pater Noster are included).⁸ Some texts that would appear, based on their textual forms and manuscript context, to be prayers are not included in the *DOE* list. Most intriguing among these omissions are four texts included instead in the category of Confessional and Penitential Texts, Cameron number B11.⁹ The omission of these texts from the category of prayers is especially interesting because all four are generally treated as prayers in the editions used by the *DOE* in compiling its Old English corpus.¹⁰ In classifying

⁶ The application of statistical analysis tools to the question of genre boundaries is not unknown. See, for example, Craig, "Stylistic Analysis and Authorship Studies." For a somewhat similar experiment to our own, using nineteenth-century British novels as a dataset, see Allison, "Quantitative Formalism: An Experiment."

⁷ Frank and Cameron, *A Plan for the Dictionary of Old English*.

⁸ Since the original Cameron *Plan* was published in 1973, one additional Old English prayer has been found and added to that number (as Cameron Text B12.4.12). See Rushforth, "The Barrow Knight."

⁹ The four texts in question are described as "Forms of Confession and Absolution" and are represented by Cameron numbers B11.9.1, B11.9.3.1, B11.9.3.2, and B11.9.4.

¹⁰ The texts known as B11.9.1 and B11.9.4 are edited by Logeman, "Anglo-Saxonica Minora." The texts numbered as B11.9.3.1 and B11.9.3.2 have been edited most recently by Pulsanio and McGowan, "Four Unedited Prayers."

the texts in this way, the *DOE* is clearly following Neil Ker's *Catalogue of Manuscripts Containing Anglo-Saxon*, which indexes all four under the heading "Forms of Confession," rather than under "Prayer."¹¹ Certainly all four texts contain confessional elements.¹² The question remains, however, whether those elements are pervasive or significant enough to justify classifying these texts as confessional materials rather than prayers. After all, many Old English prayers are confessional in nature. Within its own category of prayer, in fact, the *DOE* describes five texts specifically as "confessional prayers,"¹³ begging the question of what separates a "confessional prayer" from a "form of confession," if the latter is clearly presented and structured as a prayer. More importantly, this division raises the question of where the boundary between prayers and confessional materials should be drawn.

Statistical analysis techniques similar to Drout's lexomics approach, which make use of word frequency distribution patterns, can help draw these boundaries, although the success of the model depends largely on the specific parameters of the methodology. The number and type of words counted, for example, is a significant determinant of the ability of the approach to differentiate groups of texts. Most statistical analyses of the style or authorship of literary texts—often referred to as computational stylistics or stylometrics—restrict their examinations to a small group of the highest-frequency words, usually function words such as articles, conjunctions, and prepositions. The rationale for doing so is that markers of authorial style should be independent of the content of any individual text, so content words that might be influenced by the nature of the specific work should not be included in the analysis. In a 2007 stylometric study of the authorship of the Old English Prose Psalter, for example, statistical determination was made on the basis of only seventeen commonly occurring words, almost all of them prepositions, such as *mid*, *of*, and *to*, or simple verbs like *is* and *wæs*.¹⁴ On the other hand, Michael Drout's lexomic approach is based on an analysis of the frequency of all words appearing in a text. For the purposes of finding subtle divisions inside a long text, this model works well, but it raises problems for genre identification. Using again the example of Old English poetry and prose, although poetic words may well serve as a visible marker of the genre of poetry, those words usually make up only a small percentage of the total words in any poem.¹⁵ Thus, comparing prose and poetry simply on the basis

11 Ker, *Catalogue of Manuscripts Containing Anglo-Saxon*.

12 All four texts contain explicit references to confession using the verb *andettan*, for example. But that verb appears in a majority of the texts identified as "prayers" as well.

13 Specifically, these texts are Cameron numbers B12.4.3.1–B12.4.3.5.

14 Gill, Swartz, and Treschow, "A Stylometric Analysis of King Alfred's Literary Works." The authors of this study argue that their findings demonstrate conclusively that King Alfred is not the author of the Prose Psalms. Janet Bately has raised several objections to their approach, however, among which is the notion that even function word usage may be affected by the specific content of a text, especially in the case of a translation. See Bately, "Did King Alfred Actually Translate Anything?"

15 In the sample datasets of Old English poetry and prose described later in the essay, for example, approximately 20 per cent of the words appearing in the poetry set were exclusive to that set. Obviously, some portion of that variation can be written off as incidental to the specific texts chosen,