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## Developing a Premodern Manuscript Application Profile Using Dublin Core

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## Developing a Premodern Manuscript Application Profile Using Dublin Core

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*Librarians and catalogers, particularly at small repositories, often do not have the training or access to experts to fully describe a medieval manuscript for cataloging, much less digital access. But some descriptions must be available to attract researchers to work with the materials, which are often considered institutional treasures. Approaching manuscripts can be daunting for metadata specialists and catalogers. The Dublin Core Premodern Manuscripts Application Profile (PMAP), currently under development, is designed to be an educational and simple tool for medievalists with little knowledge of metadata and librarians with little knowledge of manuscript studies to facilitate discovery of manuscripts in little-known collections.*

**KEYWORDS** *Application Profile, Dublin Core, manuscript description, medieval manuscript studies*

Medieval manuscript study is at the heart of all research on the Middle Ages. Art historians, literature and language scholars, musicologists, historians and theologians who study medieval topics all base their work (at least in part) on material transmitted through handwritten codices and documents. Not every manuscript user specializes in the study of manuscripts as artifacts, but many study manuscripts to answer research questions focused on the text of the manuscript, its illustration, or its use (rather than the form of the object). And all medievalists try to find every manuscript that is relevant to their research (Dutschke, 2008). Comprehensive discovery of all relevant

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manuscripts can be challenging for researchers because of a lack of uniform cataloging and description standards and the difficulty locating manuscripts, which have often traveled extensively through many hands since the Middle Ages, and because the same text is unique in the physical manifestation of each manuscript as a handmade object. Libraries and scholars are now conducting more of their work with medieval manuscripts in the digital environment, and the lack of uniformity in categories and terminology has continued to be an issue for online research. This challenging situation has led the authors to propose the creation of a Dublin Core Application Profile entitled the Premodern Manuscript Application Profile (PMAP), designed to be an educational and an easy-to-use tool for describing digital surrogates for medieval manuscripts.

There are two intended audiences for this profile: (a) institutions that do not have the expertise on staff to catalog premodern manuscripts, where they often languish among other difficult-to-catalog materials, brought out only for special occasions and (b) researchers working on medieval topics using digital images of manuscripts who wish to describe the images with clear and functional metadata. In surveying the available tools for such descriptions and in discussions with special collections librarians and those attending our metadata workshops at the International Medieval Congress in Kalamazoo, Michigan, the authors have found that there is a need for such a profile and have developed PMAP in response.

The first prospective audience, institutions without the means to fully describe manuscripts, wish to attract scholars who are interested in items for their own research. Librarians and catalogers, particularly at small repositories, often do not have the training or access to experts and reference materials to fully describe a medieval manuscript for cataloging, much less digital access, yet they want to attract researchers to work with the materials (Hollas, 1997; Torre, 2007). Clearly, this is a subset of the “hidden collections” problem which has been extensively discussed (Jones, 2004; Yakel, 2005). A 2010 survey by Hubbard and Myers of 96 institutions with rare book collections found that 97.8 percent of respondents reported a backlog at their institution. A reported reason for the backlog was the “inability to change [cataloging practices] because of the special descriptive needs of rare books” (p. 140). Funding special training and materials to provide access to one or two manuscripts or fragments can be difficult. For these institutions, the investment in a reference work may be easily justified, but no single reference work can be used to learn manuscript studies. Many manuscript studies courses available through rare book schools and medieval studies programs would better prepare a metadata expert or cataloger; however the cost in travel, tuition, and “lost” work time is difficult to justify for a small collection or single item. These materials are not good candidates for contract work, because appropriate expertise may not be available locally and institutional treasures do not travel easily. The best solution for many is to describe the material, however imperfectly, ideally with digital images, and

hope to attract an interested scholar who will, in the course of his or her own research, supply the library with information to correct, enhance, and refine the manuscript description and metadata. As noted recently, “We have a kind of “chicken and egg” situation: until we start using analytical techniques we cannot provide information, but until we see the worth of that information it is difficult to justify the analysis” (Neate, Howell, Ovenden, & Pollard, 2011, p. 9). If cursory descriptions attract serious attention, a researcher would generally analyze the structure and content of a manuscript and discover information that would help the libraries fill in crucial information to improve their description.

The second audience is tied to the growing interest in digital publication and digital humanities. Researchers are beginning to investigate new ways to disseminate their research by electronic means and make their research discoverable by their fellow scholars. Many of these individuals are well versed in traditional manuscript description but have difficulty translating this knowledge into searchable and harvestable metadata because they lack experience with, or even knowledge of, metadata and its function and importance in digital exhibitions and collections. Digitization project teams often struggle to bridge communication between content providers and data managers, and the process can require both parties to master new techniques with a steep learning curve in order to accomplish the best results. This effort is repeated unnecessarily by institutions working independently without general standards to follow.

The authors have developed the proposed Premodern Manuscript Application Profile (PMAP), which is designed to help produce metadata that is accessible in a standard, shareable, recognized format that is used in many software systems and employs appropriate and recognized terms in the field of manuscript studies. The authors began the research for this project with an analysis of the elements that have historically been viewed as essential to manuscript description in order to determine which elements should be mandatory, which could be optional, and which could contribute to a simple format that would not be intimidating to novices. We studied manuscript descriptions from both print catalogs and digital metadata schemas, and list these in the “medieval manuscript studies” and “electronic description” sections of the literature review below. A table comparing the elements derived from these catalogs and schema appears near the end of this article. An application profile is defined by the Dublin Core Metadata Initiative (DCMI) as “a declaration of the metadata terms an organization, information resource, application, or user community uses in its metadata.” Elements can be taken from two or more defined element sets and include “the set of metadata elements, policies, and guidelines defined for a particular application or implementation” (Dublin Core Metadata Initiative, 2005). Elements from ENRICH (European Networking Resources and Information concerning Cultural Heritage) and the Dublin Core metadata element set were combined to create PMAP. A clear data dictionary to define the elements and to make exported

data uniform and conform to standards was also an essential component of the profile.

## MEDIEVAL MANUSCRIPT STUDIES

For centuries, manuscript description has been practiced in many different ways but lacked a clearly defined set of expectations and accepted terminology, in part as a result of the way in which the skills were taught. Because each manuscript is a unique “manifestation” of what may be a common text, manuscript studies tended to focus upon the idiosyncratic and particular features of each artifact, including the date and place of production, the physical construction of the artifact, the ownership and use of the item between its production and its current repository, and a host of additional information that can be discerned using analytical techniques applied to the evidence within the manuscript. Schools of manuscript description developed because “reading and interpreting manuscripts were skills passed on from one generation to the next, usually through apprenticeship rather than through any formal classwork. Even today, the practice in many archives is to interview the prospective researcher before allowing direct access to materials, questioning the scholar’s training and reading” (Clemens & Graham, 2007, xiii). Even within a single catalog of a large manuscript collection, the categories (“fields”) the author has chosen for analysis and the terms and conventions used to describe them may vary significantly. Paleography (the study of the history of handwriting for reading, dating and localizing texts), codicology (features of the construction of the text block), and other analytical tools are skills needed to work with these artifacts and can be difficult to acquire. With the lack of an accepted synthesis and nomenclature, many areas of manuscript study, most notably paleography, can be difficult to practice (John, 1976).

For decades, printed manuscript catalogs illustrated this through descriptions that ranged from the very basic entries in De Ricci’s *Census of Medieval and Renaissance Manuscripts in the United States and Canada* (De Ricci, 1935–1940) and other checklist-type resources to extensive descriptions of individual manuscripts published in antiquarian and academic journals. In 1969, N. R. Ker published his *Medieval Manuscripts in British Libraries*, recommending sixteen areas of manuscript description. In *The Catalogue of Medieval and Renaissance Manuscripts in the Beinecke Rare Book and Manuscript Library, Yale University*, published in 1984, Barbara Shailor included more detail about illuminations and noted imperfections, damage, and repair to the manuscript (Clement, 1985). Paul Saenger published *A Catalogue of the Pre-1500 Western Manuscript Books at the Newberry Library* in 1989, based on Ker, but with the addition of “certain codicological details and data concerning liturgical texts” (p. xiv).

Only recently has a manuscript-studies manual appeared that tries to cover the range of skills required to analyze and describe a manuscript. Raymond Clemens and Timothy Graham's *Introduction to Manuscript Studies* "has now enabled—for the first time—the introduction of detailed codicological study into the undergraduate classroom," declared Michael Johnston in the Spring 2012 issue of the journal *Studies in Medieval and Renaissance Teaching* (p. 8), a volume that was devoted to teaching the history of the book, but Clemens and Graham will not make the discipline unified in terminology and interpretation. Most survey works focus upon paleography and codicology or other features of interest such as bindings, illustration, and decoration, but all remind readers that only experience will allow one to develop the ability to accurately identify features. Other areas of the vast literature of paleography and codicology are narrow in scope, describing materials from a particular period or geographic region, reflecting the detailed and focused research questions of individual scholars.

#### ELECTRONIC DESCRIPTION OF MEDIEVAL MANUSCRIPTS

Existing electronic descriptive formats for medieval and premodern manuscripts are wide ranging but do not address the needs of the intended audience of PMAP. The first efforts to create electronic access to medieval and premodern manuscript materials began in the late 1970s and early 1980s with the use of word processors and relational databases, but most early projects used locally developed or proprietary software and each developed unique standards for the recording of the manuscript descriptions (Driscoll, 2006). These include the Producing Codicological Catalogues with the Aid of Computers (PCC) project in the Netherlands (Beinema & Geurts, 1987), Barbara Shailor's use of a word processor to create "free-text searching on a personal computer accessible to patrons in the library's reading room" (Mayo, 1990, note p. 21), and the Hill Monastic Manuscript Library's computer-assisted cataloging project (Amos, 1992). Later, printed catalogs and digital images were made available on CD-ROM disks (Faulhaber, 1999; Nikolova-Houston, 2003) or in relational databases such as Digital Scriptorium, founded in 1997 through a joint cataloging project between UC Berkeley and Columbia (see Digital Scriptorium, Wikipedia, online). Librarians and scholars began to recognize the need for "a standardized style of computerized catalogs of manuscripts, retrieval systems, and the creation of a network of computerized catalogs" (Mayo, 1990, p. 22) and international standards for description, including a uniform vocabulary (McCrank, 1992; Wagner, 2004), which would allow better remote access and broader searching.

MACHine Readable Cataloguing, or MARC, is defined by the Library of Congress as a data format that provides "the mechanism by which computers exchange, use, and interpret bibliographic information" (Library of Congress,

2006). As an existing, internationally used standard, it seemed for some to be an appropriate tool to explore first to describe medieval and premodern manuscripts. To work in a computerized environment, however, development of standardized language (which was not a feature of printed catalogs) was crucial. Work with MARC (Mayo, 1991, 1992) and the EAMMS MARC Initiative (Pass, 2000) resulted in the development of a set of standards and guidelines, published as *Descriptive Cataloging of Ancient, Medieval, Renaissance, and Early Modern Manuscripts*, or AMREMM (Pass, 2003). Early on, some manuscript scholars believed that MARC was not suitable for describing medieval manuscripts (Driscoll, 2004; Van Egmond, 1992), O’Keefe noting that “the amount of description furnished by the best-printed catalogs far exceeds the limits of the MARC format” (2000, p. 26). However, MARC, with the addition of AMREMM, has proved useful for at least initial discovery of manuscript material in library catalogs (Kropf & Rodgers, 2009 Pass, 2000). Cataloging in AMREMM, however, requires sophisticated experience that presumes both the training of a medievalist and the skills of a library cataloger. The standard demands familiarity with library cataloging rules as well as subtle understanding of rare book and manuscript cataloging best practices.

Certain features of manuscript production, particularly artwork, have received special attention, and many museums own collections of illuminated manuscripts. The Categories for the Description of Works of Art (CDWA) (Getty, 2009), which is often used in museum management software, was first published in 1996. This image-focused standard works well with illuminated manuscripts but lacks key elements to describe the text itself, such as language. The Visual Resources Association (VRA) Core version 1.0 was also published that year (Visual Resources Association, 1999) and has since been used to describe illuminations and the medieval manuscript as a visual image (Smith College, n.d.; University of Cincinnati Libraries, n.d.; University of Michigan, 2012; University of York, 2010). As Fry noted, “A number of indispensable information categories are relatively unique to manuscripts, manuscript images, and manuscript collections. They do not easily fit into, or correspond with, other image information fields” (1997, p. 101).

Additionally, in the 1990s, several efforts to digitize medieval manuscripts using Standard Generalized Markup Language (SGML) and later Extensible Markup Language (XML) began, including the Electronic Beowulf Project (EB) (Kiernan & Szarmach, 1995), the British Library’s Digital Catalogue of Illuminated Manuscripts (DigCIM) (British Library, 2012), the Digital Scriptorium (DS) (University of California Berkeley Library), and the Medieval Nordic Text Archive (Menota, 2012). The EB included a SGML-based locally created metadata schema (Solopova, 1999), and DigCIM records were created using sixteen locally defined record elements (Humphrey, 2007). DS used an Access database to collect and store metadata in a standard created by an international advisory board of manuscript scholars and catalogers (Faulhaber, 1999). This was then converted to SGML for indexing, search,

and retrieval. Manuscripts in Menota were marked up in accordance with the SGML/XML-based Text Encoding Initiative (TEI) (Driscoll, 2004). The first draft of the TEI Guidelines, known as P1, was released in 1990. In 1996 the Manuscript Access Through Standards for Electronic Records (MASTER) project worked with TEI experts to create more specific elements for the description of medieval manuscripts hoping to “define and deploy a standardized metadata scheme based on the recommendations of the Text Encoding Initiative” (Burnard, 2009, p. 20; Driscoll, 2006). The resulting schema, ENRICH (Oxford University Computing Services, 2012), includes the elements of traditional premodern manuscript description, expanding on the Manuscript Description portion of the TEI. The current version of the TEI P5 guidelines is over 1,300 pages in its printed form, not including front-matter and appendices, defining over 500 XML elements (Cummings & Burnard, n.d.). While comprehensive and covering the traditional manuscript description elements, the size and complexity of the TEI and ENRICH specification can be formidable and requires knowledge of XML (a steep learning curve in itself), a searchable XML platform, and the expertise to set it up and sustain it.

### WHY USE DUBLIN CORE?

Dublin Core (Dublin Core Metadata Initiative, 2011a) is an easy to learn and use schema that is a basic default metadata template in many digital content management systems. It originated in 1995 at a workshop held in Dublin, Ohio. Originally it consisted of 15 core elements, which have since been expanded. Dublin Core has been used to describe medieval manuscripts in Digital Case at Case Western Reserve’s Kelvin Smith Library (Case Western Reserve University, 2012), the Hill Museum and Manuscript Library (Saint John’s University, 2012), the Penn/Cambridge Genizah Fragment Project at the University of Pennsylvania Libraries (Lerner & Jerchow, 2006), and the Library of Finland’s Fragmenta Membranea project (Hakala, 2012) among others. The Walters Art Museum uses an application profile to describe its Archimedes Palimpsest which includes the Dublin Core Metadata Initiative Element Set, Content Standard for Digital Geospatial Data, and the AMICO Data Specification from the Art Museum Image Consortium (Toth, Christens-Barry, & Easton, 2006). The Dublin Core is an internationally recognized metadata standard for use primarily in the description of digital resources. It is maintained by the Dublin Core Metadata Initiative (DCMI) and accepted by the National Information Standards Organization (NISO) as standard Z39.85 (National Information Standards Organization, 2007).

The goals of Dublin Core are simplicity and ease of use, commonly understood semantics, international scope, and extensibility (Intner, Lazinger, & Weihs, 2006). It was created to be intentionally “generic,” allowing user

communities to define content standards and the use of controlled vocabularies that fit specific needs. The mission of the DCMI is to “provide simple standards to facilitate the finding, sharing and management of information” (Dublin Core Metadata Initiative, 2011b). This simplicity and ease of use is especially important to nonexperts trying to get their valuable and unique resources up on the Web quickly and economically, where they can be discovered and accessed.

The use of a commonly understood and internationally used metadata core also facilitates interoperability between schema and the sharing of metadata. The interoperability of Dublin Core metadata fields makes it easy to share data and create discovery opportunities. Unqualified, or Simple, Dublin Core is a requirement of the Open Archives Initiative (OAI) for its OAI Protocol for Metadata Harvesting (OAI-PMH). Allowing harvesting of metadata creates a wider discovery base, leading researchers back to the richer metadata at the original site. Dublin Core may also be expressed and exchanged using XML or Resource Description Framework (RDF), however, the nonspecialist metadata creator does not need to know how to use these standards if entering data into an easy-to-use content management system such as CONTENTdm, DSpace, or LUNA Insight. Extensibility is especially important in creating the richer metadata needed for unique user communities because the core 15 elements may be extended by adding additional elements. This allows repositories to develop fields for local use that conform to their historical cataloging practice, to a preferred theoretical approach to manuscript studies, or simply to the information they have available, while maintaining the “core” of exportable and interoperable fields. Extensibility creates more opportunities for researchers to discover a manuscript.

Combining elements from more than one established schema for the purpose of serving a unique user group results in an application profile. A Dublin Core Application Profile (DCAP) is created when elements from other schema are combined with the Dublin Core in order to fill the needs of a unique community while maintaining the benefits outlined above. The creation of application profiles is encouraged by the DCMI, which notes at its website, “When it comes to metadata, one size does not fit all. In fact, one size often does not even fit many. The metadata needs of particular communities and applications are very diverse” (Coyle & Baker, 2009). The needs of the medieval manuscript research community are unique and highly specialized. An educational application profile including this interoperable core would provide all the benefits of Dublin Core plus a selection of the essential community-specific fields available in ENRICH, defined and tailored to small-scale projects. Inclusion of a “data dictionary,” providing definitions and suggesting content standards for each of the DC and ENRICH elements would support a “fill-in-the-blank” template informing nonspecialists of descriptive metadata useful to medieval scholars. Finally, a simple glossary of terms should allow catalogers with limited subject expertise to create access to

valuable, but as yet hidden, medieval and premodern manuscript materials in a way that conforms to the expectations of specialists in the interdisciplinary study of the premodern world. Brief records can be created with elements available for enhancement of metadata later should the increased access and discovery attract scholars who may offer modification and revision of the metadata.

Although describing the digital and physical versions of a manuscript in the same record breaks the Dublin Core “One-to-One” rule as defined by Hillmann (2005), the needs of medievalists studying premodern manuscripts mandate that the physical artifact be described. Following the One-to-One rule, this information about original resource from which the digital surrogate was created would normally be recorded in the Source or Relation element. However, recording vital information in these fields means that “some elements and data values of primary importance to users for searching, browsing, limiting, collocating, and navigating, cannot be so processed because they are buried in a long free-text description and are not separately marked for machine processing” (Miller, 2010, p. 160). Others have also noted problems with meeting researcher needs when following this rule (Park & Childress, 2009; Shreeves, Knutson, Stvilia, Palmer, Twidale, & Cole, 2005; Urban, 2012). For this project, we have tried to work with the One-to-One rule in a practical way, which will make the metadata template more intuitive and educational to use and meet the needs of medievalists in a way that follows the IFLA cataloging principles. These principles support creating records that serve the convenience of the user and the user’s ability to Find, Identify, Select, and Obtain needed resources (IFLA 2009).

## DEVELOPING PMAP

The development of the PMAP profile was based upon Table 1, which analyzes several printed descriptive manuscript catalogs and several important electronic catalogs that developed their own schema. The elements in this table are placed in the order in which we list them in our LUNA Medieval Documents Collection (<http://luna.library.wmich.edu:8180/luna/servlet/s/4w5t8d>) at Western Michigan University. We have placed the elements we think interest users the most at the top of the list.

ENRICH and Dublin Core elements have been combined in the PMAP profile to help define and distinguish the elements needed to describe both the physical and digital components the user needs, based upon definitions outlined in the respective schema. For example, ENRICH Origin Date has been used for the origin or creation date of the manuscript, and DC Date-Issued has been used to record the publication date of the digital edition. The ENRICH Author element is used to record the creator of the original content (if known), and the DC Publisher element is used to record the entity

**TABLE 1** Comparison of Catalog Elements

PMAP ELEMENT	Printed Manuscript Catalogs				Electronic Catalogs		
	DE RICCI	KER	SHAILOR	NEWBERRY	DIGCIM	DIGITAL SCRIPTORIUM	ENRICH
MS Identifier			X	X	X	X	X
Title	X	X	X	X	X	X	X
Title-Alternative		X		X		X	X
Incipit		X	X	X		X	X
Author	X	X	X	X	X	X	X
Origin Date	X	X	X	X	X	X	X
Origin Location	X	X	X	X	X	X	X
Description							
Provenance	X	X	X	X	X	X	X
Manuscript Parts	X	X	X	X	X	X	X
Explicit		X	X	X			X
Secundo Folio		X	X	X			X
Extent	X	X	X	X	X	X	X
Subject							
Language					X	X	X
Dimensions	X	X	X	X	X	X	X
Material	X	X	X	X	X	X	X
Collation		X	X	X	X		X
Foliation		X	X	X	X	X	X
Binding	X	X	X	X	X	X	X
Decoration Description	X	X	X	X	X	X	X
Contributor		X	X	X	X	X	
Description of Hands		X	X	X	X	X	X
Musical Notation			X	X	X	X	X
Additions and Marginalia			X	X		X	X
Relation-Is Part Of							
Publisher							
Date Issued							
Type							
Format							
Format- Extent							
Identifier							
Relation-Is Referenced By		X	X	X	X	X	X
Rights							

responsible for making the digital edition available. The ENRICH Manuscript Identifier is used to identify the physical manuscript, and the DC Identifier serves to identify the digital file. ENRICH Extent is used to record the number of leaves a manuscript (or part) contains, while DC Format-Extent records the size of the digital file. DC Rights, DC Type, and DC Format may describe either the physical or digital edition. All other elements are used to describe the original manuscript. A list of PMAP elements is included in Appendix 1 at the end of this article (a complete data dictionary may be viewed at [http://web.library.wmich.edu/DIGI/reference/PMAP\\_Data\\_DictionaryTOC.pdf](http://web.library.wmich.edu/DIGI/reference/PMAP_Data_DictionaryTOC.pdf)). In many cases, creating a link to a traditional manuscript description in PDF format will help provide context for the page image or digital surrogate of the entire manuscript.

Some elements from PMAP, though not traditionally included in descriptions for print manuscripts, are needed for describing the digital manifestation and sharing information on the Web. The DC Description element is useful for providing a brief summary of the most important aspects of the manuscript for OAI harvesting. DC Subject and DC Relation-Is Part Of, also recommended for OAI harvesting of records (OCLC, 2012), are helpful in providing additional context for the user. Other elements, including DC Publisher and DC Date-Issued, are included to help clarify whether the information in that field describes the physical or the digital manifestation of the item. Of course, local repositories could add more elements that might have particular relevance for the collection being described.

## CONCLUSION

This proposed Dublin Core Application Profile is still in development. In general, the proposed application profile includes appropriate and necessary fields, but some refinements may still be desirable. We hope that this simple, straightforward profile will fill a need among small institutions and for individual researchers who are creating metadata for medieval manuscripts. By combining the traditional elements necessary for scholarly study of premodern and medieval manuscripts with those needed for digital dissemination and discovery on the Web in an easy-to-learn and easy-to-use metadata application profile, more “hidden” manuscripts and fragments may be discovered, analyzed, and incorporated into the way the Middle Ages is studied and understood.

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## APPENDIX

## Premodern Manuscript Application Profile Elements

(R = Required; M = Mandatory if available; RA = Recommended as appropriate; O = Optional)

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Additions and Marginalia (O)	Language (O)
Author (M)	Manuscript Identifier (R)
Binding (O)	Manuscript Parts (O)
Collation (O)	Material (O)
Contributor (O)	Musical Notation (O)
Date-Issued (R)	Origin Date (M)
Decoration Description (O)	Origin Location (M)
Description (R)	Provenance (M)
Description of Hands (O)	Publisher (R)
Dimensions (O)	Relation-Is Part Of (RA)
Explicit (O)	Relation-Is Referenced By (O)
Extent (O)	Rights (RA)
Foliation (O)	Secundo Folio (O)
Format (R)	Subject (O)
Format-Extent (RA)	Title (R)
Identifier (R)	Title-Alternative (O)
Incipit (O)	Type (R)

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