In Search of Textual Boundaries: A Case Study on the Transmission of Scientific Writing in 16th-Century England

Lectio praecursoria

The author defended her doctoral dissertation *In Search of Textual Boundaries: A Case Study on the Transmission of Scientific Writing in 16th-Century England* (Anglicana Turkuensia 31, Turku 2016) at the Faculty of Humanities, University of Turku, on 28 May, 2016. The opponent at the public defence was Professor Daniel Wakelin (University of Oxford), and the defence was chaired by Professor Matti Peikola (University of Turku). The following is an English translation of the introductory talk delivered in Finnish at the start of the viva.

We are gathered here today to discuss scientific and scholarly writing. A dissertation is an academic piece of writing that contains claims building on and challenging earlier research. References to scholars, dates, and page numbers are a prominent part of the text of a dissertation. These references are an integral part of the study, as they show how the doctoral candidate situates themselves in relation to their chosen field. Whereas school textbooks do not necessarily indicate the sources used in producing the text (and thus the origin of the information presented), in an academic dissertation the sources must be duly cited. The proper usage of references and the form they should take is explained in detail in various style guides.

References are used to show who has studied a certain topic or data set and what they have discovered. By including references, the writer can give credit where credit is due. The references also help the reader understand whose voice is heard at which point in the text: whose words are quoted, whose findings are used to support the argument, and whose view is challenged. With the help of references, a study written by a single person is transformed into a dialogue between scholars. Thus, references form an integral part of modern scholarship.

In my dissertation, I focus on 16th-century scientific writing. There are many parallels between the texts analysed in my dissertation and modern academic writing. For example, the writers interact with earlier authors and texts, agreeing with them or challenging their views. The texts contain references to both ancient and contemporary works and authors. However, 16th-century writers did not have a style guide or standard system of referencing; there is thus considerable variation regarding the way in which writers refer (or do not refer) to text and information taken from others. Knowledge was constructed cumulatively. Observations made by earlier authors and authorities were important, and references to earlier authors could lend some weight to the argument of the writer. However, it was by no means obligatory to provide such references, and there were no standard guidelines for how this should be done.

Those studying early scientific writing often note that it is very difficult to identify and classify scientific texts. In my doctoral research, I found that the producers of early scientific texts – such as scribes and printers – treated the boundaries of texts and works in a flexible manner. They used their sources selectively, excerpting information that they found important or interesting; they also combined material from several sources, thereby creating new texts. However, they did not necessarily give references to their sources or indicate the boundaries between texts by linguistic or visual means. This makes the identification of scientific texts more difficult and thus adds to the challenge of studying scientific material.

Another challenge related to my work is the relative lack of research concerning medieval and early modern scientific writing. Despite the high number of surviving manuscripts and printed books containing scientific writing, these texts – especially those produced before the 'scientific revolution' – have received surprisingly little attention. Even though the developments in scientific thinking during the early modern period can be seen as revolutionary from the modern point of view, they are preceded by and based on a long tradition of scientific thought.

The heliocentric theory, for example, was already considered in ancient Greece, but at that stage, the geocentric model proved more popular. While the heliocentric theory re-emerged in the early modern period, it was not adopted immediately, and astrological and astronomical calculations could still be made using established methods based on the geocentric model. Despite the advances concerning the theoretical basis of astronomy, the movements of celestial bodies and the passing of time could still be traced using the same mathematical formulae as earlier. In the 1570s, for example, the ideas of Copernicus were published in English as part of a volume containing astrological texts based on the geocentric world view.

The lack of research on early scientific writing is partly due to the fact that the status of some disciplines has changed over time. While medicine has preserved its position as an academic discipline until the present day, astrology and alchemy are today considered pseudo-scientific – despite their influence on the developments in the fields of astronomy and chemistry. The changes in the status of these disciplines are reflected in research: much more research has been conducted on medical texts than on astrological or alchemical material. However, it is anachronistic to allow the current status of these disciplines to guide historical research. The importance or relevance of a given discipline should rather be examined in its historical context.

Scientific material is often difficult to define and categorise in terms of genre. There are many astrological texts in my material. Some of these are similar to modern horoscopes, for example those discussing the characteristics of a person born in a certain astrological sign. Other texts could as well be labelled medical, since they contain instructions for diagnosing and treating patients. Many of the texts are connected to astronomy as well; in the medieval and early modern context, astrology and astronomy are part of the same field.

Regardless of the specific genre or discipline examined, scholars often present very similar observations concerning scientific writing. For example, many scholars note that the lack of scholarly editions presents an obstacle to linguistic and historical research relying on edited material. Producing such editions is also challenging, as the kind of scientific knowledge presented in these texts was circulated for millennia in several different languages. It is typically very difficult to determine the origin of a given text, or trace the textual tradition of a work throughout centuries and in various languages. Scientific knowledge was shaped and reshaped in different ways, for example by adding, omitting, reorganising, or compiling material.

The different methods of shaping text are also evident in the material I examine in my dissertation. It seems to be the case, for example, that a scribe copying a scientific text may have prioritised the reproduction of the information content over the preservation of the linguistic and stylistic form of their exemplar. The practices of copying scientific writing potentially differ from the practices of copying literary or religious material. Studying the textual processes connected to early scientific writing thus has the potential to shed new light on medieval and early modern text and book production.

As noted above, in 16th-century Europe, scientific material was available in many different languages; different technologies were also employed for producing these texts. In medieval Europe, manuscripts were an important vehicle of transmitting information and text. The introduction of moveable type in the mid-15th century brought along a new technology of text production; texts were printed in English starting from the 1470s. However, texts were still being copied by hand in the 16th century.

My study focuses on material datable to the early-to-mid-16th century. Compared to the preceding and following centuries, the text production practices of this transitional period (such as the interaction between manuscript and print) have been studied surprisingly seldom. The first half of the 16th century is also somewhat problematic from the point of view of traditional historical periodisation: in some ways, it is situated between the 'medieval' and the 'early modern'.

There were relatively few printers in England in the early 16th century, and texts were also circulated in manuscript form. There is evidence for constant interaction between the two media. For example, when a text was composed and prepared for printing in a printing shop, the source text was commonly a manuscript. Texts were also being copied from printed books into manuscripts. Similarly to the 'scientific revolution', the 'printing revolution' did not take place overnight. These labels are at least partly misleading: they refer to long-term shifts, the results of which may properly be perceived as revolutionary only from a distant, modern perspective.

The interaction between manuscript and print is also evident in my material. The manuscripts I examine in the dissertation contain several texts and images that can be connected to 16th-century English and/or Latin printed books. A 16th-century reader could use the two media in a similar manner to a modern reader who alternates between printed and digital material. For example, the modern reader may one day opt for reading the news on the internet, and on the next choose a printed newspaper instead. In the same way, a 16th-century reader could have obtained information from both printed and handwritten sources. However, manuscripts and printed books are still often studied separately. There are several specialised fields addressing one or the other medium. For example, the field of manuscript studies is concerned with handwritten material. Palaeography deals with writing systems, scripts, and hands; bibliography, in turn, is concerned with printed books.

There are also fields that do not explicitly focus on one or the other medium. For example, historical linguistics or historical discourse analysis allow for both kinds of material to be studied. In practice, however, linguistic data sets such as corpora are often constructed using only certain kinds of primary material, for example scholarly editions of manuscript material, or early modern printed books. Similarly, book history allows for studying both media. However, in practice, researchers often specialise in one medium or the other, and as a result, many book historical studies focus on either manuscript or print material.

Even though the modern scholar may use the boundary between the two media as a way of narrowing down the scope of their research, this does not change the fact that a 16th-century reader could encounter both handwritten and printed texts. The importance of studying handwritten and printed texts side by side has been brought up in recent research. Studies bringing the two media together have the potential to lead to a better understanding of early text and book production, which is why I have opted for such a point of view in my dissertation.

My material also raises the question of what constitutes a 'book'. The modern reader usually encounters 'books' as ready-made packages, presented by the

publisher and devised by a certain individual or a group of individuals. Whether the book is printed or digital, it usually contains the name of the book, as well as information on the author and the publisher. Books also often contain reading aids such as tables of contents or indices. There may also be a preface at the beginning of the book, detailing how and why the book was produced.

Some medieval and early modern books are also relatively straightforward productions: a certain text of a certain work by a certain author, bound within covers. A manuscript or printed book may also contain information on the book producers, for example the printer, scribe, or translator. Sometimes these early books come with tables of contents or indices. However, the three manuscripts I study in my dissertation are more complex 'books' – both as artefacts and as texts. The manuscripts consist of several gatherings that have been bound together. While the majority of the texts in the manuscripts were copied in the mid-16th century, the bindings of all three manuscripts date from a later period. This means that it is difficult to know in what form the manuscripts were originally produced and which texts they contained.

In my dissertation I suggest that two of the three manuscripts may have been bound together in the 16th century. One of the manuscripts, in its current state, is parchment, while the other one is paper. This may partly explain the rationale behind taking apart a volume and re-binding the material as two separate volumes. In the 16th century, it was not uncommon to bind within the same covers both handwritten and printed gatherings. Similarly, several separate printed texts were also commonly bound within the same covers; especially with short texts, this was cheaper than having each text bound separately.

These kinds of multi-item bindings have later been taken apart in libraries and bound into new volumes, placing each individual text within covers of its own. On one hand, there are thus several different rationales behind library disbindings of multi-item volumes. Potential reasons include the use of different technologies or materials for different parts of the volume, as well as the presence of several different textual items in a given volume. On the other hand, some multi-item volumes are later constructions: a later collector may have had several distinct production units (originating from different places and time periods) bound together within the same covers.

A scholar must thus be cautious when approaching an early book: it is crucial to examine the constituent parts of the book. The manuscripts I study in my dissertation are compilations in many ways. Firstly, they are compilations of texts, and thereby sites where texts taken from different sources are brought together. Secondly, they are also compilations (or composites) in the physical sense: they consist of several gatherings in which several scribal hands occur. Furthermore, the manuscripts contain material most probably derived from contemporary printed sources.

Why, then, does the physical form of a book matter? A careful analysis of the codicological structure of a book, the materials used in it, and the scribal hands on its pages may reveal how, where, and why the texts in a given book were produced. The manuscript group I examine in the dissertation can be linked to an English wool or cloth merchant, Thomas Butler (1550–1556). He was probably the first owner of the manuscripts, or at least of some parts of the manuscripts.

Butler's name is found several times in the manuscripts. He also copied some of the texts himself. His scribal hand is one of the pieces of evidence connecting the manuscripts in the group. In terms of orthography, Butler's English differs from that employed, for example, in contemporary print. Butler's language thus offers

a fascinating perspective on linguistic variation in the 16th century. Butler also reworks the texts he copies, for example by abbreviating texts and words.

It is important to acknowledge the connection between the content and the visual/material form of a text: in text production, the linguistic interacts with the visual/material. For example, a scribe copying a text, when approaching the end of a page, could abridge the text or section being copied in order to fit it on the page. Where there was empty space left on a page or in a gathering after the main item had been copied, brief texts could be added as filler items. Those who produce text professionally must, even today, face various constraints, such as word counts or page limits. Spoken texts, such as this *lectio*, may also be regulated by setting a time frame for the speech that the speaker has to adhere to. Similarly, 16th-century text producers had to adapt to the various constraints affecting their work.

The interaction between the content, language, and visual/material form of a text should be acknowledged and taken into account in linguistic research and textual scholarship – regardless of the medium. I chose to approach my material from a philological perspective precisely because of this reason. Adopting a philological viewpoint enabled me to employ several mutually complementary methods, resulting in a fuller overall picture of the manuscript group examined.

University of Turku MARI-LIISA VARILA