1 An interdisciplinary approach to medical writing in Early Modern English

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> Historically, language is an indispensable guide both to theoretical scientific ideas and to real actions. Any language embodies a theory of meaning, a logic, a classification of experience, a conception of perceiver, knower and agent and their objects, and an apprehension of existence in space and time. We need to ask how language conditioned scientific thinking and was in turn altered by it. We may distinguish three levels: those of the structure of a language itself, of general conceptions of the nature of things expressed in it, and of particular theories.
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> (Crombie 1995: 232–3)

This book examines the connection of language and science in English medical writings in the period 1500–1700. We approach this link through situated analyses of language and texts, paying attention to context in all its multifaceted aspects, from the broad context of culture to situational and cognitive discourse contexts and to the narrow linguistic context. The twelve chapters of the book analyse language use in medical texts in their disciplinary, social and societal embedding. The basic theoretical assumption on which the book relies is the view of language as communication that always takes place in a particular context of discourse, characterized by time and place, between people – speakers and hearers or writers and readers – and for a particular purpose. This communicative situation has an impact on how the speakers or writers formulate their message. In such communicative events, negotiating meaning is a process that needs to be viewed in the multilayered context, but it can be viewed from different perspectives; when the perspective changes, new features of the object of enquiry become visible. In historical texts, the facts of production and reception are often elusive, and in the absence of historical evidence, the communicative situations need to be reconstructed hypothetically, and it is also possible to place the focus on the discourse itself.

The approach adopted in the book presents an interdisciplinary challenge, as a contextualized analysis of medical language requires an understanding of the contemporary history of medicine as an area of special knowledge and

practice. The key to meeting this challenge is the collaboration between medical historians and historical linguists, as it is often at the interfaces between various disciplines where innovations are created by fusions of various ways of thinking and methodological triangulation. In this volume, the methods of historical research are represented in taking the background socio-historical developments into account and considering how they influenced textual reality and readership. The politics of medical literacy and book historical details are important for an understanding of the reception of these works by audiences of various social and educational backgrounds and mindsets. Linguistic methodologies to studying the special language of medicine provide various angles. Several chapters adopt the framework of historical pragmatics, understood here in a broad sense as a perspective to language use, including societal aspects and overlapping with sociolinguistics (see Taavitsainen and Jucker 2010). In some chapters, the approach is semantic, and some chapters apply advanced corpus-linguistic methods with statistical tests. All empirical contributions take variation and change of early modern medical writing as their point of departure (see, for example, Milroy 1992). Variability in language use is a key concept here, as variation in linguistic features mirrors the varying underlying language-external parameters, both in micro-level speaker/writer-related factors and at the macro-level of historical and sociocultural context. The studies make use of a new database, the corpus of *Early Modern English Medical Texts* (*EMEMT*), but the ways in which they exploit it for answering their research questions vary. In most chapters, the methods are corpus-aided, i.e. the database has been searched with relevant lexical items for the research task in question, and the located passages have been scrutinized with qualitative assessments. Automatically created word lists have been employed to make the searches as precise as possible, taking, for example, spelling variation into account. Statistical corpus-linguistic methods have been applied in three chapters, one of which relies on co-occurrence patterns of several linguistic features with stance-marking functions.

The book is part of a larger project on the evolution of English as the language of medicine, where the history of science and medicine provides a language-external frame of reference against which linguistic forms and functions are examined. In scientific communication, one of the contextual sociocultural factors influencing the message is the prevailing scientific ideology or thought-style.[1] Scientific thought-styles can be defined as the underlying scientific concepts, objects of enquiry, methods, evaluations and intellectual commitments related to the epistemology of science (Crombie 1994: 5–6). Like any other ideologies, scientific thought-styles are mediated through language and are connected with particular ways of using language.

[1] See http://www.helsinki.fi/varieng/domains/scientific%20thought.html (accessed 17 August 2010).

The styles of thinking within any society or culture endure as long as the underlying commitments and dispositions remain stable, and with changes in the ways of scientific thinking, the ways of communicating science also change (see Taavitsainen and Pahta 1995). But everything does not change: in fact, changes come about in a less conspicuous way than generally assumed, and recent research shows that the great majority of early modern medical writings continue in the old vein, carrying over conventions from previous writing (Taavitsainen 2009c). New knowledge is constructed through questions based on earlier knowledge, and, similarly, innovations in communicating knowledge take place within the existing frame.

What changes in the language and how, and what remains the same, are questions for the linguist to answer. Our general claim is that changes in the underlying scientific ideology as well as in the discourse community can be verified both on the micro-level of individual linguistic features and on the macro-level of argumentative structures and textual organization. Continuities and changes in early English medical writings need to be examined with special reference to materials written in the prevailing institutional language of science, Latin. In our earlier research, we have focused on continuity and change in medieval English medical writing from the fourteenth and fifteenth centuries, the first phase in the vernacularization of science and medicine (see Taavitsainen and Pahta 2004). In this book, we explore the essence of medical writing in the second and third waves of vernacularization in the period between 1500 and 1700, with a focus on the continuities and changes that can be observed in language and text.[2]

The 200-year period in focus in this book is characterized by major sociocultural changes that affected the domain of medicine as an area of knowledge and praxis. This needs to be taken into account in the analysis of writings produced within it. During this period, the scientific paradigm experienced a major epistemological shift: medieval scholastic, logocentric science, relying on knowledge derived from Galen, Hippocrates and other ancient writers, gave way to new ways of constructing knowledge, relying on empirical methods and explanatory principles based on observation and cognition (see Crombie 1994; Taavitsainen and Pahta 1995). Significant advances were made in medical theory. Dissatisfaction with deeply entrenched ancient medical doctrines had begun to increase by the late Middle Ages, and in the course of the sixteenth and seventeenth centuries the new intellectual climate produced several momentous publications, laying the foundations for the new science of medicine. Andreas Vesalius' *De humani corporis fabrica* (1543), based on solid facts observed in careful dissections, was a breakthrough in the field of anatomy. Although the work did not contain startling

[2] The first wave, 1375–1475, and the beginning of the second were dealt with in our previous book (Taavitsainen and Pahta 2004). The first fifty years examined in this book still belong to the second phase. The early modern period, 1550–1700, has not been dealt with from this perspective before.

new discoveries, it induced a shift in intellectual strategy, marking an end to appeals to ancient authority (Porter 1996: 155–7). The growing prestige of anatomical discoveries based on first-hand knowledge also began to change the orientation towards the physiological composition of the body and its mechanisms. Here the breakthrough came a century later than in anatomy: the revolutionary work by William Harvey in *Exercitatio anatomica de motu cordis et sanguinis in animalibus* (1628) marks the beginning of a new phase in physiological inquiry (Siraisi 1990: 190–2; French 1994: 85). The new knowledge was also gradually translated to medical praxis, although old practices in treatment continued by the side of innovation.

The domain of medicine was also undergoing a major language shift. In the course of the late medieval period, English medical writing had slowly begun to emerge from the shadow of Latin in non-institutional contexts (see, for example, Voigts 1989b; Taavitsainen and Pahta 1998; Pahta and Taavitsainen 2004). By 1700, English had challenged Latin as the language of institutional medical science and had become the dominant language of medical writing in England, used as the original medium of communicating new scientific discoveries. The triumph of English is illustrated in the increase of medical books listed in the *English Short-Title Catalogue* (*ESTC*; see Chapter 2). An important milestone in the history of English scientific and medical writing is the foundation of the Royal Society of London in 1662 (M. Hunter 1981: 48). Despite its early international connections, the innovative society decided to publish its *Philosophical Transactions* (*PT*) from the very beginning in 1665 primarily in English, a decision that in the first phases involved extensive translation from other European languages into English (Gotti 2006a).[3]

Furthermore, the newly discovered printing technology caused changes in the dissemination of knowledge by written communication (see, for example, McKitterick 2003). Texts became more widely available in identical multiple copies and accessible to the literate at a relatively cheap price. Medical publishing really took off in the 1640s, and after 1660 over 150 medical books were printed per decade. The first scientific journals and periodicals began to appear towards the end of the seventeenth century. At the same time, medical knowledge continued to circulate in handwritten texts, including letters and notebooks, and oral exchange remained an important means of communicating medical advice (see Chapter 2).

New ideas are always born within the old, and it takes time for the innovations to gain ground. The roots of early modern medicine lie deep in medieval medicine and antiquity, and the first half of the sixteenth century saw little change in medical literature as the new print medium simply replicated old materials that had earlier circulated in manuscripts. Perhaps the most dramatic change is the general shift from anonymous writings to

[3] But see Note 8 in Chapter 2.

texts written by individuals under their own names. The New World had been discovered, but news from beyond the seas was delivered in the old thought-style, and it took several decades for information about new medicines, such as tobacco and coca, to reach European medical literature (see Ratia and Suhr in this volume, Chapter 10). Doubt was raised as to whether ancient authorities were right after all, as observation did not agree with, for example, plant illustrations derived from old books. Changes in the reporting styles of news from the New World took place in the latter half of the sixteenth century (Taavitsainen 2009b). The seventeenth century saw further changes. A more general stylistic change has been attributed to the Royal Society period, with the birth of new genres of experimental essays and book reviews, for instance. This statement needs to be reassessed as well, and with the new extensive corpus of medical texts it will be possible to date the changes and to define the locus of change more precisely than has been done before.

The 'foreign culture of early modern medicine' (Wear 2000: 1) has received increasing attention lately, with new book-length studies on more ephemeral materials, such as almanacs and recipe books (e.g., Curth 2007; Jenner and Wallis 2007; Leong and Pennell 2007). There is a clear shift of interest from more elite professional writing to the literature that reached the heterogeneous 'ordinary' readerships, new women audiences and 'the poor'. With the new knowledge gained from previously unstudied materials, cultural diversity has come to the forefront, and the overall picture of early modern medical writings is changing, as earlier knowledge is challenged by the new perspectives and discoveries. The borderlines between the different periods and different types of writing are not clear-cut, and we can notice an array of varying cultural practices that overlap and are exploited by society at large, by both professional and laypeople, but in somewhat different forms.

Features connected with stance and attitudes to knowledge are relevant for tracing reflections of scientific ideology in texts on the temporal axis. Studies on evaluation and attitude are a major trend in recent synchronic and diachronic linguistic research. In the time period under scrutiny here, 1500–1700, a great deal happened in the style of writing. The attitude to the object of enquiry changed from the absolute certainty of the scholastic thought-style to cautious assumptions of the researcher employing new instruments in laboratory conditions, with peer researchers of heterogeneous backgrounds watching the experiment. Another noticeable line of development is seen in the audience involvement and politeness scale, from respectful address to humiliating remarks addressed to the readership where the educated author places his own knowledge high above the multitude:

First to the Vulgar: Kind souls I am sorry it hath been your hard mishap to have been so long trained in such Egyptian darkness, even darkness which to

your sorrows may be felt; the vulgar road of Physick is not my practice, and I am therefore the more unfit to give you advice; … You must not think (curtaeous People) that I can spend time to give you examples of all Diseases, these are enough to let you see so much light as you without Art are able to receive, If I should set you to look upon the Sun I should dazle your eyes and make you blind. (Culpeper 1652b: 242)

The chapters in this book are organized so that large-scale mappings of linguistic features across the whole *EMEMT* corpus come first, and detailed investigations of individual genres or shorter time periods are placed towards the end of the volume. The first chapter defines our approach and sets the scene of our research. Chapter 2 describes the primary data used in the book, the *EMEMT* corpus, which provides new comprehensive material for studies on the role of language in science and makes it possible to study early modern medical writing with more precision and to probe into the 'medical mindsets as represented in vernacular medical books' (Wear 2000: 2). Chapter 2 places the corpus texts in the broader context of medical books and the dissemination of knowledge in the early modern period. Chapter 3 relates to an essential cultural background feature and describes various literacy practices, turning the spotlight from the texts to the actual readers of medical texts. Literacy is approached as a multilayered analytical concept constituting different levels of practices. Together, these chapters at the beginning of the volume pave the way to the empirical linguistic studies.

Verbs of knowing are investigated by Hiltunen and Tyrkkö in Chapter 4. They scrutinize their distributions along the time axis in periods of fifty years and across the various corpus categories as defined in the description in Chapter 2. The results show variation between the categories. The distinctions are clear and can be related to the sociocultural backgrounds. The study sheds new light on the diachronic development of thought-styles and indicates that a large-scale modelling of the underlying ideologies of the history of written documents is possible.

Medical definitions provide a means of organizing and systematizing medical knowledge. This core feature is the topic of lexicological and lexicographical assessment by McConchie and Curzan in Chapter 5. Their analysis combines an assessment of *EMEMT* materials and early dictionaries. The study shows that medical practitioners with university education were more precise and more innovative than contemporaneous lexicographers in their formulations.

The chapter by Taavitsainen, Chapter 6, examines a key notion of a medical theory: the concept of *humour.* She investigates its appropriation in different types of texts, aimed at professional and lay audiences, but her assessment also extends beyond *EMEMT* to contemporary correspondence and to drama, showing the influence of the humoral theory in early modern culture. By contextual analysis, she demonstrates how different the semantic associations are in these registers of writing.

Multilingualism is in focus in Pahta's chapter, Chapter 7. Her analysis of multilingual practices in *EMEMT* material pays attention to the linguistic and textual forms and functions in which writers of vernacular medical texts made use of other languages. The study reveals a wide repertoire of languages, including Latin, Greek, Arabic and European vernaculars, which the writers use primarily to communicate domain-specific knowledge.

The chapters by Marttila and Mäkinen, Chapters 8 and 9, examine recipes, an important and widely disseminated genre in early modern England. Marttila focuses on authors' strategies, paying special attention to how they take the audience into account. Metatextual passages often emphasize helping 'the poor' as the motivation for writing. Such comments have been dismissed as a social decorum, but Marttila's analysis shows that there is more to these statements as, for example, many recipe books depict the recipient of the advice as the patient. In general, authors strived to get their message across to the uninitiated. The epistemology of knowledge is addressed from a different angle by Mäkinen, who studies the continuity and change of expressions used for confirming the efficacy of recipes, thus persuading the readers to accept the advice provided as being useful.

Ratia and Suhr focus their attention on medical pamphlets in Chapter 10 and examine linguistic structures connected with interpersonal language use. Pamphlets were a new means of distributing knowledge, and the medium was especially well suited for debating, bringing forth viewpoints in controversies and spreading news of efficient medicines to potential consumers. The textual strategies discovered in the analysis include features intended to facilitate reader or listener comprehension, to involve the audience and to influence the early consumers' behaviour.

Chapter 11 by Gotti discusses functional macrostructures of language, focusing on the early phases of the new medium to distribute medical and scientific knowledge, the first long-standing scientific journal in England, the *Philosophical Transactions* (*PT*) of the Royal Society of London. This was the period when specialized discourse was still in its embryonic stages, but the new lines of development leading to present-day conventions can already be discerned.

In the final chapter, Chapter 12, Gray, Biber and Hiltunen examine the qualification of knowledge by the use of various stance markers across three categories within the *PT*, with contemporary material from the other five categories in *EMEMT* for comparison. The analytical grid is dense and provides interesting results both across the whole corpus and within the *PT* genres. In contrast to earlier assumptions, the study shows that book reviews contained the most innovative language use.

In the quotation that opens this chapter, Crombie specifies three levels on which language has conditioned scientific thinking and has in turn been altered by it in the history of science: the structure of a language, the general conceptions of the nature of things and particular scientific theories. The role of language in expressing general conceptions of the nature of things

is at the heart of the studies in this volume, examining the knowledge base of medicine, the essence and meaning of knowledge and attitudes towards it, which are all expressed by specific and varying linguistic structures. We have made an attempt to probe into the practices of early modern medical authors and have shed light on the reception of their texts and the use of medical theories in early modern society. The individual studies show that it is possible to achieve new knowledge with more extensive materials structured according to the socio-historical background factors. This book shows what can be done with the new corpus, and we hope that new paths will open up with little-explored materials and new methods developed within corpus linguistics.[4]

[4] *EMEMT* was released for public use in December 2010. In addition to texts that faithfully preserve their original spellings, the corpus includes normalized versions of texts, making new applications of corpus linguistics possible, e.g., keyword and cluster analysis.

2 Medical texts in 1500–1700 and the corpus of *Early Modern English Medical Texts*

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2.1 Introduction

English medical texts from the period 1500–1700 are a large and heterogeneous group of writings, including texts circulating in print and manuscript forms on a range of medical topics, representing a variety of genres, written by authors with varying educational and professional backgrounds for different types of target audiences. The 200 years in focus here were a period of important changes from the medieval world view to the first stages of empirical science. In this chapter, we shall first discuss the background and the transmission of medical knowledge with different modes, oral and written, and media, printed books and manuscripts. Sections 2.2 and 2.3 give an overview of medical literature throughout the two-century period. Section 2.4 introduces the *Early Modern English Medical Texts* (*EMEMT*), a computer-readable text collection designed to facilitate research on printed medical texts of the period and used as primary material in the studies in this book.

2.2 Printing and manuscript circulation

Dissemination of medical knowledge underwent major changes in the early modern period. The advent of printing introduced a new technology that enabled the production of multiple copies of a text more quickly and more cheaply than had been possible with copying by hand. This affected both the more prestigious kinds of text, those produced by learned men, and those texts that were meant to provide basic medical information to laypeople, for instance almanacs that might sell for 2d. Printed books in the period are found in different formats from folio-size display objects with fine illustrations to small pocket-size manuals to be carried around and consulted at the bedside. The almanac gained the widest possible print distribution, and various types were issued with medical concerns, astrological prognostications and useful advice, which sold in hundreds of thousands, or even millions

of copies (Capp 1979; Curth 2006). However, the progress of medical printing in England was slow in comparison with Continental Europe. In the late fifteenth and early sixteenth centuries, relatively few editions of printed books on medicine in English appeared. Only after 1550 did the numbers of medical books printed in England begin to increase sharply. In part, the explanation for this relative backwardness may have been the small scale of the local printing industry compared to places such as Paris, Lyon, Venice or Strasbourg, whose own print productions could be readily imported to England. Demand for English-language printing was, in any case, modest compared to that for Latin or other European vernaculars.

Still, the impact of print on the circulation of medical ideas and information was profound, in England as elsewhere. But this impact is best understood not as a displacement or replacement of other more 'primitive' methods of communication, primarily speech and handwriting, but as a process of dynamic interaction with them. Take, for example, the giving of medical advice in this period. Leong and Pennell (2007: 138) write:

> Oral exchange was still the primary vehicle for communication of medicinal advice in early modern England. However, the setting down of advice to preserve that exchange (but by no means to fix the information transmitted during it) was not the sole preserve of the prescribing physician or apothecary. Instructions to make medicaments for all sorts of ailments and illnesses were exchanged during social visits, circulated in letters, and were recorded into bound notebooks. Sometimes they were even merely bundled together as batches of paper. The onward circulation of individually inscribed recipes and prescriptions, indeed of entire manuscripts, provided other compilers with an important source for their own collections.

The availability of medical advice in print did not replace these kinds of circulation of information but acted as a new resource, a kind of accelerant of them. Recipes could be copied from a printed book into a manuscript, or collections of recipes in manuscript could find their way into print.

Even where printed medicine was readily available, some kinds of medical texts were still better suited to handwritten production. An obvious instance is the compilation of remedies from various sources which is tailored to the interests and capacities of the individual scribe and user.[1] Second, in an educational or learning environment, the students might want to make notes by hand on lectures they had heard or based on their reading, which would serve their individual needs (Blair 2008). Third, medical practitioners might find it useful to compile by their own hand aides-memoire of useful information or records of treatment they had given to their patients (see P. M. Jones

[1] See the collection of digitized English seventeenth-century recipe books at the Wellcome Library (http://library.wellcome.ac.uk/etexts.html); also microforms in Pennell (2004b).