Lexicography, Printing Technology, and the Spread of Renaissance Culture[1]

Patrick Hanks
Institute of Formal and Applied Linguistics, Charles University in Prague

Historians of lexicography in the English-speaking world have implied that Robert Cawdrey's Table Alphabeticall *(1604) is the first English dictionary. Landau (1984, 2001) makes this claim, adding that it is 'the least inspiring of all seminal works'. In this paper, I agree that the* Table Alphabeticall *is uninspiring, but I deny that it is a seminal work. Landau overlooks the rich 16th-century tradition of Renaissance and Humanist lexicography in Europe, in particular the* Dictionarum, seu Thesaurus Linguae Latinae *of Robert Estienne (1531) and the* Thesaurus Linguae Graecae *of his son Henri Estienne (1572). These seminal works are astonishing achievements—breathtaking innovations—in terms of both scholarship and technology. They set standards for subsequent European lexicography. Two technological innovations made these great dictionaries possible: the invention of printing by Gutenberg in Strasbourg in about 1440 and the typography of Nicolas Jenson in Venice in 1462. These technological developments and the lexicographical achievements that were made possible by them contributed, in the first place, to the Renaissance programme of preserving the classical heritage of ancient Greece and Rome and, in the second place, to the role of dictionaries in spreading Renaissance culture and Humanism across Europe. The paper goes on to briefly outline the emergence of bilingual lexicography, replacing the polyglot lexicography that was standard in the 16th century. A comparison is made between the influence of printing technology on 16th century lexicography and the potential influence of computer technology on 21st century lexicography.*

1. Dictionaries before Cawdrey

Surveys of English lexicography, starting with Murray (1900), tend to give the impression that the first English dictionary was Robert Cawdrey's *Table Alphabeticall*, published in 1604. This little book is a dictionary of hard words, mostly 'inkhorn terms' - learned words that were introduced in profusion from Latin into English by scholars during the 16th century. Apart from the fact that Cawdrey's book is addressed to women - who, in the 16th and 17th centuries were rarely fortunate enough to receive a Latin education, although in those times competence in Latin was a requirement for career success - the *Table Alphabeticall* is a historical curiosity of comparatively little intellectual or cultural interest. It had no ambition to be a reasonably full inventory of the lexicon, a goal that had been pursued (for Latin) by several important lexicographical works in Continental Europe in the 16th century. The notion that a dictionary should serve as an inventory of the lexicon of a language was not an innovation of English lexicographers.

The prominence assigned to Cawdrey's *Table Alphabeticall* by Murray (1900) and by subsequent Anglocentric writers such as Starnes and Noyes (1946) had the unfortunate effect of deflecting attention from the rich lexicographic tradition of the European Renaissance in the 16th century, in which English was only one of several participant languages - a rather minor one, as we shall see. Starnes (1963) tried to correct the false impression given by his earlier work, but apparently in vain. Landau (1984, 2001) describes Cawdrey's *Table Alphabeticall* as a seminal work, adding that it is 'the least inspiring of all seminal works'.

[1] I am grateful to John Considine and Gilles-Maurice de Schryver for comments on an earlier draft of this paper. Thanks are also due to Anne Urbschat for help in the selection and preparation of the illustrations.
Illustrations of original printed entries from the Estienne dictionaries cited are shown by courtesy of the Librarians of All Souls College, Oxford and Christ Church, Oxford. For electronic versions of Renaissance dictionaries, acknowledgment is due to the magnificent Lexicon of Modern English (LEME) database of the University of Toronto: *http://leme.library.utoronto.ca/*
Research for this paper was funded in part by the Czech Ministry of Education (MSM 0021620838) and the Czech Science Foundation (P406/2010/0875) as part of a series of studies in lexicography at the Institute of Formal and Applied Linguistics of the Charles University in Prague.

The *Table Alphabeticall* is indeed uninspiring, but it is not a seminal work.

The word ***dictionary*** itself came into English as an inkhorn term in the mid 16th century. The *Oxford English Dictionary* (OED) shows that the Medieval Latin word *dictionarium* was coined as early as 1225 and was used to denote a collection of Latin words arranged according to subject, rather than in alphabetical order. More exotic synonyms such as *glossarium* 'glossary', *cornucopia* 'horn of plenty', *elucidarius* 'elucidator', and *thesaurus* 'treasure house'also became widespread.

OED comments:

> Dictionaries proper are of two kinds: those in which the meanings of the words of one language or dialect are given in another (or, in a polyglot dictionary, in two or more languages), and those in which the words of a language are treated and illustrated in this language itself. The former were the earlier.
> OED second edition, s.v. *dictionary*

So what were these Renaissance dictionaries before Cawdrey? What did they consist of, how and where did they originate, who compiled them, and what was their purpose?

Scholarly studies by Starnes and Talbert (1955), Starnes (1963), Considine (2008), and an excellent chapter by Bately (2009) in Cowie's monumental *Oxford History of English Lexicography* have gone some way towards correcting the misleading impression perpetuated by Landau and others. Bately shows how lexicography developed as a scholarly and cultural activity during the 16th century. She observes that lexicographers both of Latin-English dictionaries and of other foreign language-English dictionaries turned to the continent for models and sources.

> So, when, in 1538, Thomas Elyot […] produced his unidirectional Latin-English *Dictionary*, the authorities he cited included French, Dutch, and Italian contemporaries, who, like him, were seeking to provide the linguistic tools demanded by the 'New Learning'. It was the monolingual Latin *Dictionarium* of 'Calepinus' – Augustinian friar Ambrogio Calepino of Bergamo –, first published in 1502, that was his chief source. And when Elyot's dictionary was reissued in 1542 as the *Bibliotheca Eliotae – Eliotis librarie*, it was from the *Dictionarium Latino-Gallicum* (1538) of French printer Robert Estienne […] that much of its new material was derived.

More will be said about Calepino below. And it should be noted here, at the outset, that Estienne was much more than a printer in the modern sense. He was also a classical scholar, an editor, a publisher, and a Humanist thinker, conversing on equal terms with the leading Parisian intellectuals of his day.

2. The development of printing and typography

The development of lexicography in 16th-century Europe was dependent on the development of printing technology and the associated craft of punch-cutting and type-founding. Dictionary-like compilations pre-dated printing, of course, but dictionaries as products for widespread general use only became available because of the rapid reproduction of identical copies that printing made possible. Collections of words with glosses were created in monasteries as manuscripts throughout Europe in the later Middle Ages. Mostly, these works consisted of collections of Latin words glossed into vernacular languages, for the benefit of young novices learning to read Latin texts, sometimes arranged (more or less roughly) in alphabetical order, sometimes thematically. For propagation each manuscript had to be laboriously copied out by hand, and each act of copying could produce only one copy at a

time, each with its own idiosyncrasies and copying errors. The invention of printing by Johannes Gutenberg in about 1440 in Strasbourg (subsequently moved to Mainz) changed everything, not only for lexicography but for all other fields of knowledge, as discussed by Eisenstein (1979). Suddenly, rapid replication and massive dissemination of identical copies of a text - including large and complex texts such as dictionaries - became possible.

Three components contributed to and are intertwined with the development of lexicography and with each other: the invention of printing, the rediscovery of classical Latin literature, philosophy, and art (including lettering), and the development of challenging thinking that constituted the Reformation. The history of all these events has been intensively studied, but their interaction bears re-examination, for an understanding of it will crucially affect our appreciation of the early history of European lexicography. Let us first look at the relationship between printing and lexicography.

After Gutenberg, a key figure is Nicolas Jenson, a man of German extraction who was born in 1420 in Sommevoire, France (about half-way between Paris and Strasbourg). By the 1450s, Jenson had risen to become controller of the French royal mint at Tours. In 1458 he moved to Mainz, where he evidently became fascinated by the technology of printing with movable type, recognizing its potential for the rapid dissemination of knowledge. To this technology, he devoted the rest of his life. After a few years as a printer and publisher in Mainz and Frankfurt, Jenson moved to Italy, where, in Venice in 1468, he set up shop as a printer, publisher, and typographer. Between 1468 and his death in 1480 he edited and printed about 150 books, mostly editions of Latin theological tracts, but also some Latin classics, some Greek, an Italian guide to medicinal herbs, and miscellaneous other works. Jenson was not the only printer and typographer in Venice in the 1470s, but he is surely the most important of them.

Let us look a little more closely at his typographic principles, which were to play such an important role in the development of lexicography in subsequent decades, not only in Venice, but also as far afield as Paris, Lyons, Frankfurt, and Geneva. Jenson's type styles were based on the clean lines and subtle distinctive serifs of the lettering on monumental inscriptions that had been created by anonymous Roman stonemasons and other craftsmen a millennium and a half earlier. An important part of Jenson's contribution to the Renaissance was his replacement of the heavy black lettering style of medieval manuscripts, which had served Gutenberg for a model, with the more sharply defined letters of the ancient Roman alphabet.
A key principle of early Venetian typographers, in particular Jenson, was legibility. The generic term for this style of typography is Antiqua, in contrast to the Germanic Black-Letter style. As far as we know, Jenson designed, cut, and founded his own type. No doubt his experience of overseeing working in metal at the French Royal Mint stood him in good stead. According to an advertisement issued by his firm shortly after his death, Jenson's typographic symbols,

> 'do not hinder the reader's eyes, but rather help them and do them good. Moreover, the characters are so intelligently and carefully elaborated that the letters are neither smaller, larger, nor thicker than reason or pleasure demand.'

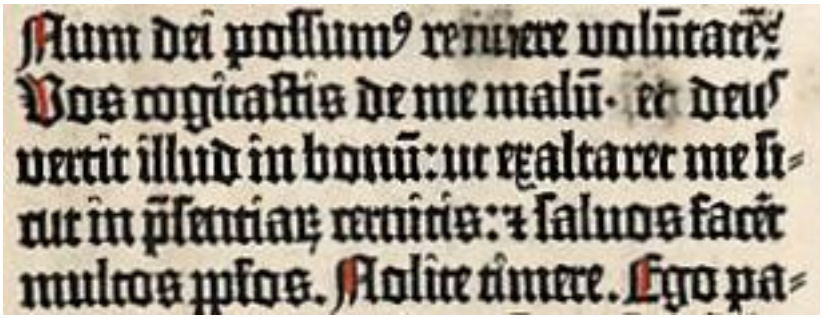


Figure 1. The Gutenberg Bible (c. 1455): sample from the *Book of Exodus*

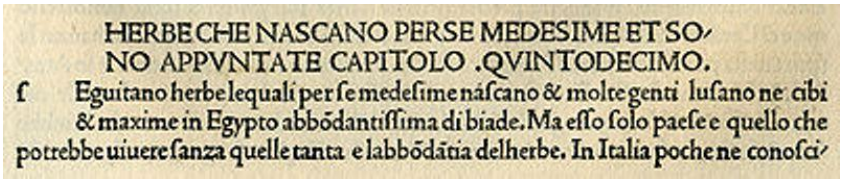

HERBE CHE NASCANO PERSE MEDESIME ET SO-
NO APPVNTATE CAPITOLO .QVINTODECIMO.

Figure 2. Sample of Jenson's typography (from the Wikipedia entry for 'Jenson')

A comparison of a sample of Gutenberg's Black Letter (Figure 1) with Jenson's Venetian Old Style (Figure 2) is instructive. At first glance, the two seem to have almost nothing in common. The letters look as if they might even represent different alphabets. Gutenberg's style is a version of the letters in medieval manuscripts. Jenson's is completely different: to a modern reader, it looks uncannily familiar, because it established typographical principles that are still relevant today. It is astonishingly, even shockingly modern - a design achievement worthy of the 20th-century Bauhaus at its best. It was the foundation of almost all subsequent type-founding and design in the Roman alphabet down to the present day, with the exception of German Fraktur, which owes more to the tradition of Gutenberg and medieval manuscripts and which, even in 19th-century Germany, was recognized to be unsuitable for printing dictionaries, not least because it is uneconomical in terms of space on the page and its potentially ambiguous when used in a small size. Typefaces based on medieval manuscript lettering are designed to be read slowly and sequentially. Medieval reading was slow. By contrast, the legibility of Jenson's type style enabled fast, non-sequential skimming and dipping, of a kind characteristic of dictionary use. It takes a modern reader all of thirty seconds to become familiar with the idiosyncrasies of Jenson's Venetian Old Style. These are:

- representation, in certain contexts, of the letters ***n*** and ***m*** as a superscript bar over a preceding vowel (suggesting nasalization of the vowel rather a full-quality consonant)
- two forms of the letter ***s***, long and short, whose uses are contextually determined
- two short forms of Latin words meaning 'and': the symbol '&', which is still used today in certain contexts, and 'q:' for the bound morpheme *-que*.

In all other respects, Antiqua type styles are recognizably the same as their modern equivalents. Other great type designers and punch-cutters of 16th-century Europe (Graffo, Bembo, Garamond, Baskerville, and others) would design typographical symbols that share most of their fundamental characteristics with those of Jenson, although it has to be said that they do not share the same classic simplicity. Jenson's typographical principles have survived unchanged through the centuries and through various more recent technological revolutions for over 500 years. This is all the more remarkable when we consider the idiosyncrasies of conventional handwriting styles of the Renaissance, which require many hours of training in paleography before they can be read with fluency.

An important aspect, from the point of view of lexicography, of Jenson's contribution was that his typographic principles made it possible for printers to put many more words on the page without sacrificing legibility. This was to be an important contribution to the herculean lexicographic efforts that were to come. In a big text (and Renaissance dictionaries were big), more words on the page means fewer pages, which in turn means a more manageable product.

Fourteen years after Jenson's death, his printing and publishing business in Venice was inherited (in 1494), through marriage, by a man who was to play a pivotal role in the Italian Renaissance. Teobaldo Manucci, better known as Aldus Manutius (1450-1515), was a scholar with a passion for Ancient Greek philosophy and classical literature. Aldus was a man of means as well as scholarship. He devoted himself to using the technology of typesetting and printing to recover as many classical works as he could from obscurity and to preventing further losses. He commissioned the typographer Francesco Griffo to create additional typefaces, including Greek (though the Greek typefaces are full of cursive features and much less legible than the Roman ones designed by Jenson). Aldus acquired ancient Greek manuscripts from all over the Levant and the eastern Mediterranean region and employed Greek-speaking editors and compositors to collate and edit these manuscripts and get the texts typeset and printed. Venice was well placed for this activity, as the Venetian Republic during the 15th and 16th century held sway politically over some of the islands of Greece (Naxos, Crete, and the Ionian islands), so he had access to Greek-speaking scholars and workers.

Another important figure must now be briefly mentioned. In 1508 the Humanist scholar Erasmus was staying in Venice as a guest of Aldus Manutius. Here, he compiled his *Adagia*, a sort of dictionary of quotations from Classical authors. As he readily acknowledged, he received much help from the scholars and editors in Aldus's workshop, including Aldus himself. The *Adagia* is not merely a collection of quotations and proverbs, but also contains discursive articles on certain selected key words and concepts. It is a source of the lexicographical insistence on supporting definitions and explanations with citations.

3. Printing in 15th-century England

Printing was introduced to England in the 1470s by William Caxton. Caxton took up printing only towards the end of his life; he was an extremely energetic man with many other business, artistic, and literary interests: a highly respected and successful merchant as well as a writer, translator, printer, and publisher. After a period spent living and working in Bruges and elsewhere, he established himself as an importer of velvet, silk, and other luxurious fabrics, eventually rising to be governor of the Company of Merchant Adventurers of London. It was not until 1475-76, when he was over sixty years old, that he established the business on which his present-day fame rests. He set up a printing press, at first in Bruges and later in London, in imitation of one that he had observed in Cologne. The output of Caxton's press was prolific. Among its most famous publications were Chaucer's *Canterbury Tales* and Mallory's *Morte d'Arthur*.

Caxton and his business partner Wynkyn de Worde (an Alsatian whom he had met in Bruges) did not publish any dictionaries apart from a very modest French-English glossary. The earliest printed dictionary in England was the *Promptorium Parvulorum* ('Young People's Storeroom'), an English-Latin word list, printed in 1499 by Richard Pynson. This work had been compiled about sixty years earlier by Galfridus Anglicus (alias Galfridus Grammaticus 'Geoffrey the Grammarian'), a Dominican friar who lived in Norfolk. Its 10,000 entries (words and phrases) had already been laboriously copied out by hand several times - the only

means of dissemination possible until the invention of printing - before Pynson set it in type and printed it (Figure 3). Both Caxton and Pynson used type styles that were based on those of Gutenberg. Neither had been able to learn about or benefit from the streamlined, economical character of contemporary Venetian typography. Indeed, principles of typographical clarity analogous to those of 15th century Venice were not really introduced into England for another 300 years. Over a hundred years after Pynson, Cawdrey's printer still used black-letter type for glosses, and English typography of the 17th and 18th centuries is full of unnecessary flourishes and ligatures. It looks cluttered and fussy compared with the clean lines and legibility of Jenson and Aldus Manutius.

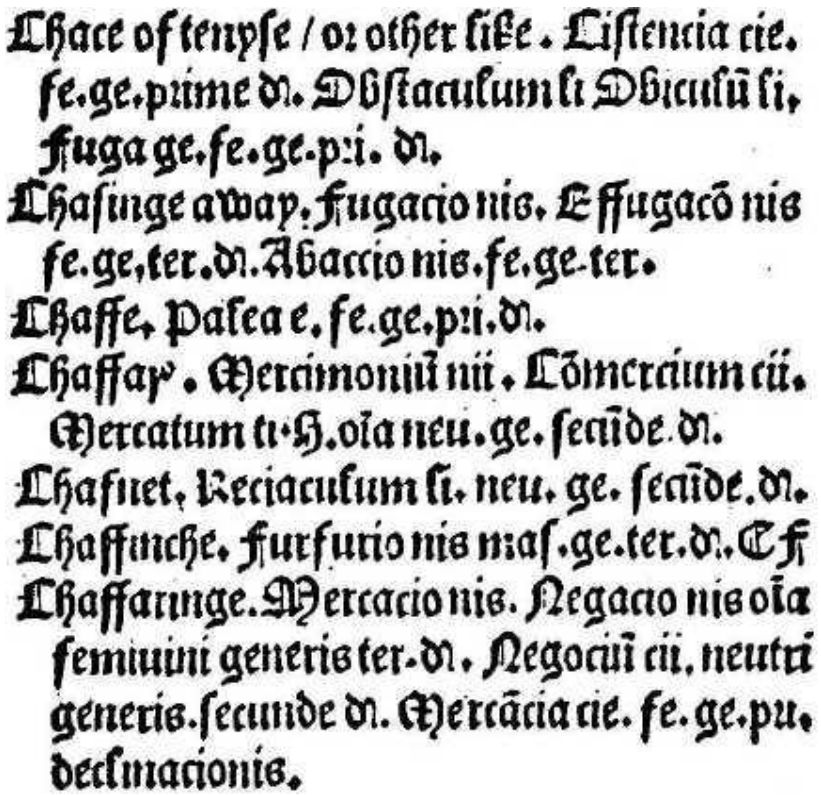

Chace of tenyſe / or other like. Liſtencia cie.
fe.ge.prime dn. Dbſtaculum li Dbiculū li,
fuga ge.fe.ge.p:i. dn.
Chaſinge away. Fugacio nis. Effugacō nis
fe.ge,ter.dn. Abaccio nis.fe.ge-ter.
Chaffe. Palea e. fe.ge.p:i.dn.
Chaffar. Mercimoniū nii. Cōmcraium cii.
Mercatum ti·H.oīa neu.ge. ſecūde dn.
Chaſnet. Reciaculum li. neu. ge. ſecūde.dn.
Chaffinche. Furfurio nis maſ.ge.ter.dn. Ef
Chaffaringe. Mercacio nis. Negacio nis oīa
femiuini generis ter.dn. Negociū cii. neutri
generis. ſecunde dn. Mercācia cie. fe.ge.pu.
declnacionis.

Figure 3. Extract from Pynson's printing of *Promptorium Parvulorum*, 1499.

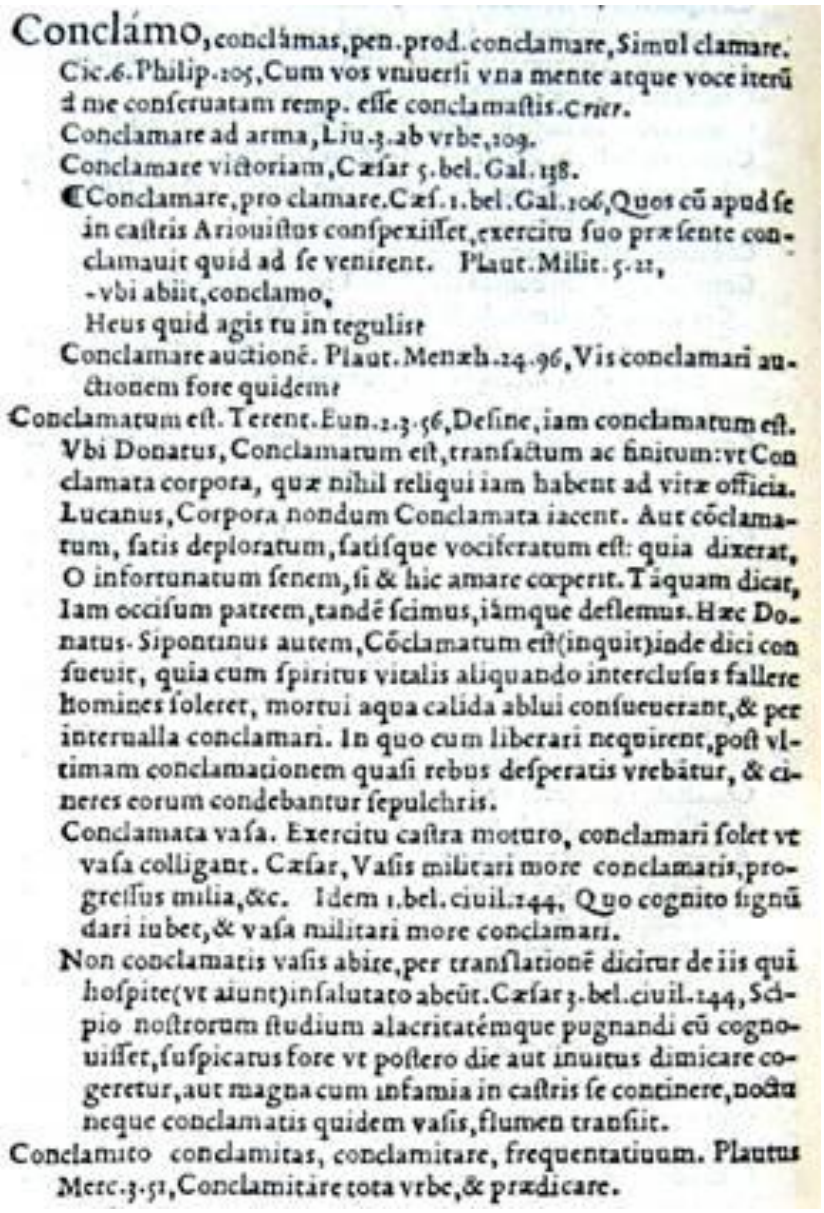
4. The Estienne family of Paris and Geneva

If we compare the first printing of *Promptorium Parvulorum* (1499) with the Latin dictionaries compiled, edited, and printed in Paris by Robert Estienne family in the 1530s, we see a quantum leap in both technology and scholarship. *Promptorium Parvulorum* is a practical work for students struggling to express themselves in Latin, i.e. for encoding use, printed in heavy black-letter type. By contrast, the *Dictionarium, seu Thesaurus Linguae Latinae* (1531) of Robert Estienne is a work for scholarly use by people reading the Latin texts of classical antiquity, many of which Estienne also printed. In his authoritative study of Renaissance lexicography, Considine (2008) argues that preservation of 'heritage' was an important part of the goal of Renaissance lexicographers such as the Estiennes. Early lexicographers were not merely producing practical tools for language learners or translators; they were contributing to the Renaissance programme of preserving and indeed reviving the classical heritage.

The type of Estienne's *Dictionarium* was designed, cut, and cast by Claude Garamond, one of several type cutters with whom Estienne had a business relationship. Garamond's elegant type

style owes more to the Venetian Antiqua school of typography than to Gutenberg, though it is embellished by the occasional flourish which Jenson would surely have regarded as superfluous. Nevertheless, Estienne's *Dictionarium* is both a work of scholarship and a triumph of elegance in the printer's art - an aesthetic pleasure to peruse as well as a scholarly inventory of the vocabulary of classical literature. This is also true, though to a lesser extent, of the *Thesaurus Linguae Graecae* (1572), which was compiled, edited, printed, and published forty years later by Robert's son Henri Estienne II.

If we look at an entry from Estienne's 1531 *Dictionarium* - I have chosen, more or less at random, the entry for *conclamo* (Figure 4) - we can see immediately that this is not a bilingual French-Latin dictionary. It is a monolingual dictionary of Latin, with a French gloss (in this case, '*Crier*') appended. The rest of text is taken up with morphological information, a monolingual gloss in Latin ('*simul clamare*'), and a great wealth of citations from Latin authors, on the basis of which Estienne offers collocational norms, some of which are glossed or explained in Latin (not French).



Conclámo, conclãmas, pen. prod. conclamare, Simul clamare.
Cic. 6. Philip. 105, Cum vos vniuerſi vna mente atque voce iterũ
à me conſeruatam remp. eſſe conclamaſtis. Crier.
Conclamare ad arma, Liu. 3. ab vrbe, 109.
Conclamare victoriam, Cæſar 5. bel. Gal. 138.
¶ Conclamare, pro clamare. Cæſ. 1. bel. Gal. 106, Quos cũ apud ſe
in caſtris Arioviſtus conſpexiſſet, exercitu ſuo præſente con-
clamauit quid ad ſe venirent. Plaut. Milit. 5. 22,
-vbi abiit, conclamo,
Heus quid agis tu in teguliſt
Conclamare auctionẽ. Plaut. Menæh. 24. 96, Vis conclamari au-
ctionem fore quidem?
Conclamatum eſt. Terent. Eun. 2. 3. 56, Deſine, iam conclamatum eſt.
Vbi Donatus, Conclamatum eſt, tranſactum ac finitum: vt Con
clamata corpora, quæ nihil reliqui iam habent ad vitæ officia.
Lucanus, Corpora nondum Conclamata iacent. Aut cõclama-
tum, ſatis deploratum, ſatiſque vociferatum eſt: quia dixerat,
O infortunatum ſenem, ſi & hic amare cœperit. Tãquam dicat,
Iam occiſum patrem, tandẽ ſcimus, iãmque deflemus. Hæc Do-
natus. Sipontinus autem, Cõclamatum eſt (inquit) inde dici con
ſueuit, quia cum ſpiritus vitalis aliquando intercluſus fallere
homines ſoleret, mortui aqua calida ablui conſueuerant, & per
interualla conclamari. In quo cum liberari nequirent, poſt vl-
timam conclamationem quaſi rebus deſperatis vrebãtur, & ci-
neres eorum condebantur ſepulchris.
Conclamata vaſa. Exercitu caſtra moturo, conclamari ſolet vt
vaſa colligant. Cæſar, Vaſis militari more conclamatis, pro-
greſſus milia, &c. Idem 1. bel. ciuil. 144, Quo cognito ſignũ
dari iubet, & vaſa militari more conclamari.
Non conclamatis vaſis abire, per tranſlationẽ dicitur de iis qui
hoſpite (vt aiunt) inſalutato abeũt. Cæſar 3. bel. ciuil. 144, Sci-
pio noſtrorum ſtudium alacritatémque pugnandi cũ cogno-
uiſſet, ſuſpicatus fore vt poſtero die aut inuitus dimicare co-
geretur, aut magna cum infamia in caſtris ſe continere, nocte
neque conclamatis quidem vaſis, flumen tranſiit.
Conclamito conclamitas, conclamitare, frequentatiuum. Plautus
Merc. 3. 51, Conclamitare tota vrbe, & prædicare.

Figure 4. R. Estienne, *Dictionarium*, 1536, entry for 'conclamo'

The French glosses in Estienne's *Thesaurus Linguae Latinae* play a comparatively minor role. More striking is the large number of citations and references. Estienne was concerned not merely to say what the meaning of each Latin word is, but to record where the word is used in the classical Latin texts that he had available to him. This is in essence very similar to the lexicographical principles adopted for the academy dictionaries of the 17th century to the present day.

Estienne's work is part of the true foundation of European lexicography. Following Starnes (1963), we may regard Robert Estienne's Latin dictionary of 1531 as a seminal work, but this does not mean that it had no predecessors or that he and his team of lexicographers were working in a vacuum. He was part of a highly productive accretive continuum of European lexicography. Other Latin dictionaries had appeared even earlier, in particular that of Ambrogio Calepino (1502). It is clear that the scholars in Estienne's workshop made use of these works, just as OED built on the foundations laid by Johnson (1755) and other earlier lexicographers.

Among the factors that distinguish Estienne's 1531 dictionary from its predecessors are its meticulous scholarship, the systematic inclusion of citations from works of classical literature (many of which were also printed by Estienne), a concern with semantic differentiation and phraseology, and reliance on readable typography.

There can be no doubt that Considine (2008) is right that the main purpose of Robert Estienne's 1531 *Dictionarium* was to contribute to the preservation of the heritage of classical literature, and the same is true of the equally ambitious and equally monumental *Thesaurus Graecae Linguae*, published by his son Henri Estienne in 1572 (Figure 5).

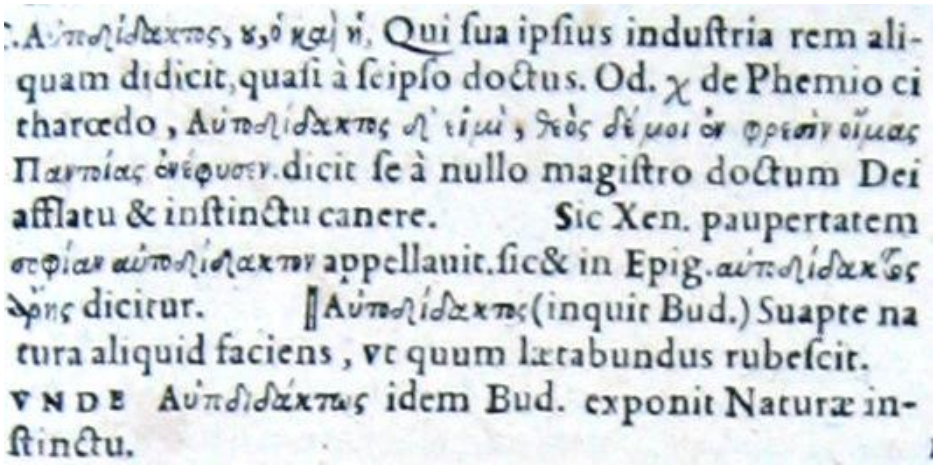
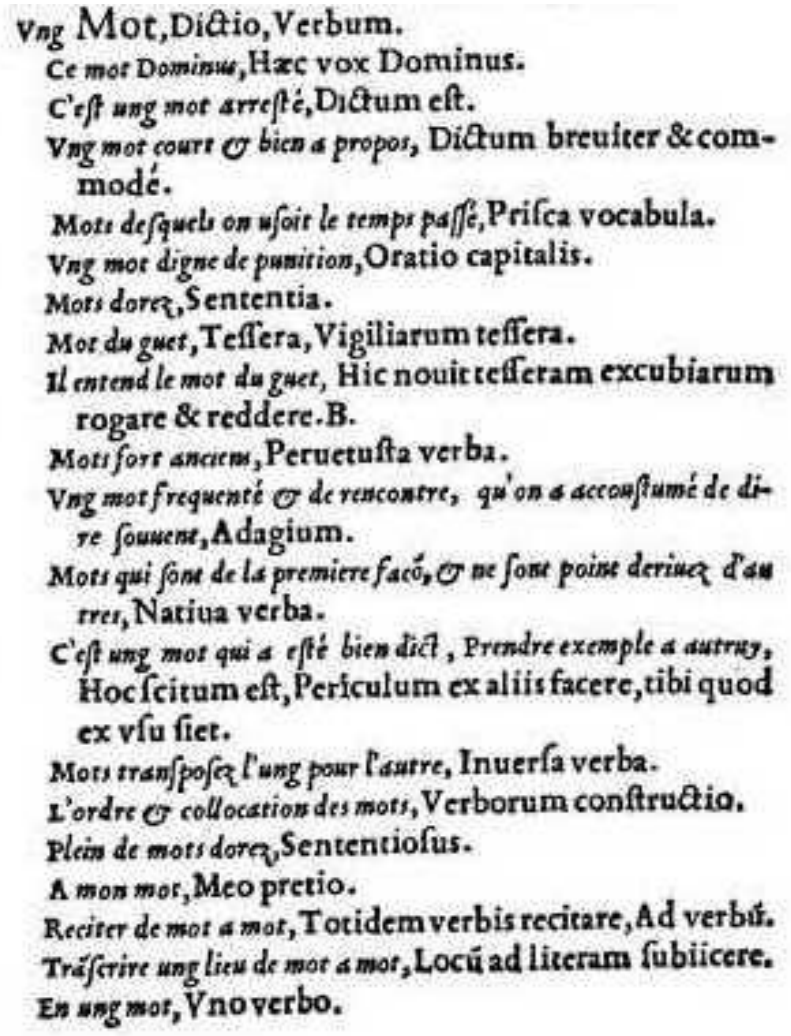

Αὐτοδίδακτος, ος, ὁ καὶ ἡ, Qui ſua ipſius induſtria rem aliquam didicit, quaſi à ſeipſo doctus. Od. χ de Phemio citharœdo, Αὐτοδίδακτος δ' εἰμὶ, θεὸς δέ μοι ἐν φρεσὶν οἴμας Παντοίας ἐνέφυσεν. dicit ſe à nullo magiſtro doctum Dei afflatu & inſtinctu canere. Sic Xen. paupertatem σοφίαν αὐτοδίδακτον appellauit. ſic & in Epig. αὐτοδίδακτος ἀρὴς dicitur. ‖ Αὐτοδίδακτος (inquit Bud.) Suapte natura aliquid faciens, vt quum lætabundus rubeſcit. VNDE Αὐτοδιδάκτως idem Bud. exponit Naturæ inſtinctu.

Figure 5. H. Estienne, Extract from *Thesaurus Graecae Linguae*, 1572.

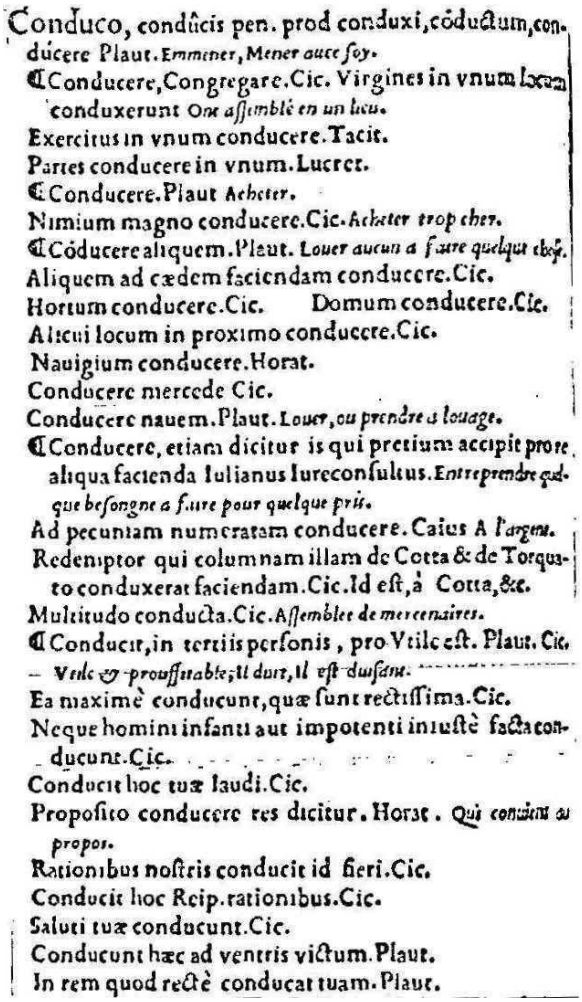
Two other important dictionaries of Robert Estienne show a different side of this great lexicographer. As we have seen, his main concern in 1531 was to cater to the needs of scholars and literati by preserving the heritage of the classical Latin language. But he was also sensitive to the needs of more humble students and language learners. The *Dictionnaire francoislatin* of 1539 (Figure 6) is a practical work explicitly aimed at students wishing to express themselves in Latin. A noticeable feature is the large number of idiomatic French phrases for which Latin equivalents are offered. For example, *l'ordre et collocation des mots* is glossed as 'verborum constructio'. Robert Estienne placed considerable emphasis on phraseology and context: it is perhaps not too fanciful to believe that he would have been sympathetic to modern theories of collocation and construction grammar.



Vng Mot, Dictio, Verbum.
Ce mot Dominus, Hæc vox Dominus.
C'eſt ung mot arreſté, Dictum eſt.
Vng mot court & bien a propos, Dictum breuiter & commodé.
Mots deſquels on uſoit le temps paſſé, Priſca vocabula.
Vng mot digne de punition, Oratio capitalis.
Mots dorez, Sententia.
Mot du guet, Teſſera, Vigiliarum teſſera.
Il entend le mot du guet, Hic nouit teſſeram excubiarum rogare & reddere. B.
Mots fort anciens, Peruetuſta verba.
Vng mot frequenté & de rencontre, qu'on a accouſtumé de dire ſouuent, Adagium.
Mots qui ſont de la premiere facõ, & ne ſont point deriuez d'autres, Natiua verba.
C'eſt ung mot qui a eſté bien dict, Prendre exemple a autruy, Hoc ſcitum eſt, Periculum ex aliis facere, tibi quod ex vſu ſiet.
Mots tranſpoſez l'ung pour l'autre, Inuerſa verba.
L'ordre & collocation des mots, Verborum conſtructio.
Plein de mots dorez, Sententioſus.
A mon mot, Meo pretio.
Reciter de mot a mot, Totidem verbis recitare, Ad verbũ.
Tranſcrire ung lieu de mot a mot, Locũ ad literam ſubiicere.
En ung mot, Vno verbo.

Figure 6. R. Estienne, *Dictionnaire francoislatin*, 1539, entry for 'mot'

A complementary (and equally practical) work published by Robert Estienne in 1552 is the *Dictionarium Latino-Gallicum* (Figure 7). This is not a revised version of his 1536 work. Instead, it is a practical guide whose aim is to help students decode the meanings of Latin words and Latin texts into their native French. As can be seen in Figure 8, there are many more French glosses on the Latin words and phrases than in the 1536 work (though they are still, by modern standards, sparse). The 'principle parts' of verbs are given at the start of the entry ('conduco, conducis, conduxi, conductum, conducere'), which is helpful for both decoding and encoding use. Citations from literature have been replaced by short phrases, often with a gloss. The authority of a classical author for phraseology is invoked in abbreviated form, but generally without a full citation. Thus, the Latin phrase 'nimium magno conducere' is included on the authority of Cicero and glossed as '*Acheter trop cher'*, i.e. in English, 'to buy too dear'. This is information of a kind that is particularly useful for students learning to read and understand Latin texts, as opposed to scholars who were already fluent in Latin. It is also, coincidentally, of potential interest to modern scholars studying the cultural persistence of conventional metaphors and idiomatic phrases in European languages going back to classical Latin.



Conduco, condûcis pen. prod conduxi, cõductum, conducere Plaut. *Emmener, Mener auec soy.*
¶ Conducere, Congregare. Cic. Virgines in vnum locum conduxerunt *Ont assemblé en un lieu.*
Exercitus in vnum conducere. Tacit.
Partes conducere in vnum. Lucret.
¶ Conducere. Plaut *Acheter.*
Nimium magno conducere. Cic. *Acheter trop cher.*
¶ Cõducere aliquem. Plaut. *Louer aucun a faire quelque chose.*
Aliquem ad cædem faciendam conducere. Cic.
Hortum conducere. Cic. Domum conducere. Cic.
Alicui locum in proximo conducere. Cic.
Nauigium conducere. Horat.
Conducere mercede Cic.
Conducere nauem. Plaut. *Louer, ou prendre a louage.*
¶ Conducere, etiam dicitur is qui pretium accipit pro re aliqua facienda Iulianus Iureconsultus. *Entreprendre quelque besongne a faire pour quelque pris.*
Ad pecuniam numeratam conducere. Caius *A l'argent.*
Redemptor qui columnam illam de Cotta & de Torquato conduxerat faciendam. Cic. Id est, à Cotta, &c.
Multitudo conducta. Cic. *Assemblee de mercenaires.*
¶ Conducit, in tertiis personis, pro Vtile est. Plaut. Cic. *Vtile & prouffitable; Il dure, Il est duisant.*
Ea maximè conducunt, quæ sunt rectissima. Cic.
Neque homini infanti aut impotenti iniustè facta conducunt. Cic.
Conducit hoc tuæ laudi. Cic.
Proposito conducere res dicitur. Horat. *Qui conuient au propos.*
Rationibus nostris conducit id fieri. Cic.
Conducit hoc Reip. rationibus. Cic.
Saluti tuæ conducunt. Cic.
Conducunt hæc ad ventris victum. Plaut.
In rem quod rectè conducat tuam. Plaut.

Figure 7. R. Estienne, *Dictionarium Latino-Gallicum*, 1552, entry for 'conduco'.

Trench (1858) rightly describes lexicographers as 'the inventory clerks of language', but these great Renaissance lexicographers were very much more than mere inventory clerks. They were scholars, compilers, definers, printers, and publishers. The Estienne firm was founded by Henri Estienne (ca. 1460-1520), who had married the widow of a printer in 1502 and expanded the business. Three sons and two grandsons became printers. There can be no doubt that Robert Estienne (1503-59) was the greatest of the family, even though his son Henri II was to successfully tackle the even more challenging task of compiling a scholarly dictionary of classical Greek. Part of the greatness of Robert lies in his evident concern for students as well as scholars and the range of the different dictionaries that he and his staff compiled and published, a range that would have been quite impractical without the recent innovations in the technology of printing and typesetting.

In addition to his remarkable achievements in scholarly and practical lexicography, Robert Estienne also ran a successful printing business, publishing editions of major classical texts and other works. According to his biography (Armstrong 1954), he printed and published on average 18 books a year in Paris, as well as undertaking his massive lexicographic projects. He ran a lively and polyglot workshop. According to his son Henri II, 'There sat down to table daily a staff of ten assorted nationalities, together with family and guests, all speaking Latin, including the servants' (Armstrong 1954: 15). She estimates, on the basis of contemporary records, that in its heyday the firm employed a staff of 50 (2 type-founders, 18 compositors, 5 proof-readers, 21 printers, 3 apprentices, and one shop boy), in addition to the

master himself and his family. Estienne was on intimate terms with the greatest Parisian scholars and intellectuals of his day. He styled himself 'printer to the king' but eventually, as an outspoken Protestant, in or before 1550 he found it prudent to remove himself to Geneva, where his output dropped to about six books a year.

5. Polyglot and bilingual dictionaries during the Renaissance

The most important and innovative bilingual dictionary of the early 16th century was compiled in English. It is Palsgrave's large and ambitious *Lesclaircissement de la langue francoyse* (1530). Palsgrave had been tutor at the English court to Henry VIII's sister Princess Mary, who in 1515 became Queen of France. His guide to the French language is not only a bilingual dictionary but also a grammar. The dictionary part contains 18,890 English-French equivalents. Black Letter type is used for English, Antiqua for French. The arrangement is alphabetical by part of speech; i.e., each part of speech is given a separate 'table'. The table of substantives consists mostly of single-word equivalents, with disambiguation of polysemous words, e.g. there are two entries for ***meale: meale of corne*** is glossed as 'farine', ***meale of meate*** is glossed as 'repast'. The table of verbs pays more attention to phraseology (see Figure 8). Each sense of each English verb is first embedded in an English phrase (or given an English gloss), and then the target word and/or the phrase as a whole is translated into French.

The table of Verbes. Fo. CC.

howe he craſſheth theſe gryſtels by-twene his tethe: Eſcouſtez comment il fayt creſper ces tendrons entre ces dens.

I Cratche violétly with my nayles/ Ie gratigne, prime cõiuga. and ie gratte, prime coniuga. It is dogges and cattes play to byte and cratche: Ceſt le ieu des chiens et des chatz que de mordre et gratigner, oz gratter.

I Craue I demaunde oz aſke/ Ie demande, prime coniuga. and ie coc-quine, prime cõiu. I am content that you ſhall go with me/ but craue nat I warne you: Ie ſuis content q̃ vous yrez auecques moy, mays ne cocquinez poynt ſi vous men croyez.

I Crawle I ſkyzre with my lymmes as a yonge chylde dothe oz any beeſt that ſkyzreth & can nat go noz moue the bodye/ Iecroſle, prime con. It is a ſtraũge ſyght to ſe a chycken howe it crauleth firſt out of ỹ ſhell: Ceſt vne choſe eſtrange que de veoyr yng ieune pouceyn comment il croſle premierement hors de leſcalle.

I Create I make a thyng of nothyng/ Ie cree, prime coniuga. God created all this woꝛlde of nothyng: Dieu crea tout ce monde de riens.

I Crepe as a ſerpent dothe/ Ie vas parterre, oz ie vas gliſant. Though this adder do but crepe nowe/ if you anger her ſhe wyll leape: Combien que ceſte couleuure ne fait q̃ aller par terre, oz aller gliſſant, ſi vous le courroucez vous le verrez ſaillyr.

I Crepe I ſteale vpon one ſodaynly as age dothe/ Ie ſurprens a deſpourueu. Age crepeth vpon vs oz we be ware: Vieilleſſe nous ſurprent a deſpourueu auant que nous y donnons garde.

I Crepe vpon all four as a chylde dothe/ Ie vas ſur tous les quattre. This lytell boye wolde fayne be at home foꝛ he crepeth vpon all foure bycauſe he can nat go: Ce petit enfant vouldroyt eſtre voulentiers a la maiſon, car il va ſur tous les quattre pour ce quil ne peult aller.

I Crye I make a noyſe/ Ie crie. pri. cõiu. I muſt go to my chylde I here hym krye: Il fault que ie aille a mon enfãt ie los crier. Ha ſyꝛ I krye you mercy: Ha ſyre la voſtre mercy. I kry you mercy I kylled your cuſſheyn: Ie vous crie mercy iay tué voſtre cuiſſeyn.

I Crye out as one dothe that is in daunger/ Ie meſcrie, ie me ſuis eſcrié, eſcrier. verbũ mediũ. prime con. He kryed out a loude: Il ſeſcria haultement. My mother was a fraŷde there had ben theues in her houſe/ & ſhe kryed out harolt alarome: Ma mere auoit paour quil ny euſt des larrons a la mayſon, et elle ſeſcria harol alarme.

I Crye out as a beeſt dothe that is hurte/ Ie braye, prime coniuga.

Figure 8. Extract from Palsgrave's *Lesclaircissement de la langue francoyse* (1530)

Palsgrave was a true comparative linguist as well as a pioneering lexicographer. However, rather surprisingly, his fine example was not followed: his work did not serve as a model for other bilingual dictionaries of vernacular languages - at least, not for another sixty years. Instead, the standard lexicographical tool used for translation during the Renaissance was a polyglot dictionary based on Latin. It is time to examine how this came about.

By 1490, many cities in Italy, Germany, and the Netherlands had a printing press, many of which produced dictionaries, vocabularies, and word lists of one sort or another - some in thematic order, others in more or less exact alphabetical order. Most of these were monolingual Latin dictionaries, the demand for them reflecting the status of Latin as the language of knowledge, culture, and international communication. The first Greek-Latin lexicon was compiled and published by a Carmelite monk, Giovanni Crastone of Piacenza (1497).

As for vernacular languages, there blossomed in the early 16th century a fine crop of monolingual Italian dictionaries, as described by Alonge (2006). This is a clear indication of the confidence of Italians in their language as a literary medium rivaling Latin, distinguishing it in status from other vernaculars of Renaissance Europe.

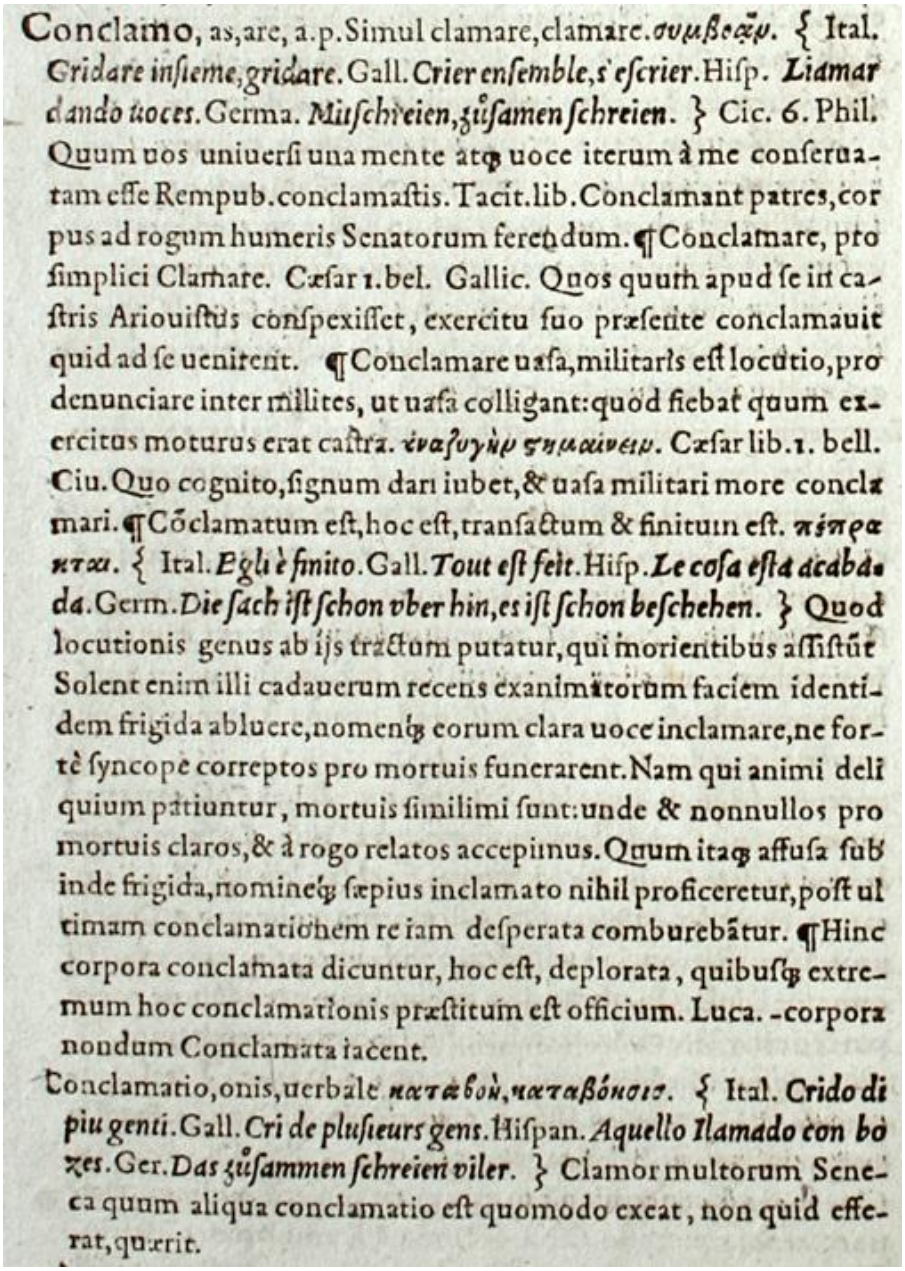
Surprisingly, though, there were few bilingual dictionaries of vernacular languages at this stage. Everything was mediated through Latin, which functioned as a sort of interlingua. As shown by Kramer (2006) and Schoonheim and Pijnenburg (2006), in the German-speaking lands and the Netherlands, early Latin-German and German-Latin lexicographic works appeared, notably Van der Schueren (1477), Dasypodius (1535-36), and Maaler (1561). The complex relationships among European languages of this period are well described in Burke (2002).

The seminal work in the development of European bilingual lexicography (or rather, multilingual lexicography) was the *Dictionarium* of Ambrogio Calepino. Calepino's original edition (1502) was a Latin vocabulary, with glosses in Latin supported by citations, together with encyclopedic entries for the figures of classical mythology. In a second edition, glosses in Italian and French were added. By a process of accretion, the vocabularies of other languages, starting with Greek and Hebrew, were gradually added to successive editions of Calepino's original. In the words of Fried (2007: 231), 'it evolved into the first polyglot dictionary.' By 1580, a dozen different editions, containing glosses in up to eleven different languages, all attributed to Calepino, were in print, published in locations as far apart as Reggio nell'Emilia, Venice, Paris, Strasbourg, Hagenau, Lyon, and Rome. In Paris alone, five competing editions appeared between 1524 and 1541. The 1573 edition printed and published in Venice includes the following comment in its front matter, quoted and translated by Freed:

In hac postrema editione, ut hoc dictionarium commodius exteris nationibus inservire possit, singulis vocibus latinis italicas, gallicas, & hispanicas interpretationes inseri curavimus.

In this latest edition, in order that this dictionary might more fully serve foreign nations, we have taken care to insert Italian, French, and Spanish definitions among the lone Latin entries.
By this time, of course, Ambrogio Calepino himself (1450-1510) was long dead and his book had become common property. Stathi (2006) argues that the popularity of the many 'Calepinos' was due, not to its etymologies, but to its explanations of meanings and to the inclusion of examples of word use. The extraordinarily complex bibliographical history of this work and its derivatives was traced by Labarre (1975). This shows that multilingual

editions really began to take off in the 1550s (Figure 9); by the 1580s it had come to include lexical items in up to 11 languages - not only Latin, Greek, Hebrew, Italian, French, and Spanish, but also barbarous and outlandish tongues such as German, English, Polish, and Hungarian. By the end of the century, a Latin-Portuguese-Japanese 'Calepino' had appeared, supporting the missionary work of the Portuguese Jesuits who were at that time seeking to Christianize Japan. It has been said that Calepino's work is deficient in scholarly precision. Moreover, these polyglot works are great, cumbersome things, not suitable for carrying around and not particularly user-friendly. Nevertheless, these were the principal works that served the practical translation needs of Europeans in the 16th century.



Conclamo, as,are, a.p.Simul clamare,clamare.συμβοᾶν. { Ital. Gridare insieme,gridare. Gall. Crier ensemble,s'escrier. Hisp. Llamar dando uoces. Germa. Mitschreien,zůsamen schreien. } Cic. 6. Phil. Quum uos uniuersi una mente atq; uoce iterum à me conseruatam esse Rempub. conclamastis. Tacit. lib. Conclamant patres,corpus ad rogum humeris Senatorum ferendum. ¶ Conclamare, pro simplici Clamare. Cæsar 1. bel. Gallic. Quos quum apud se in castris Ariouistus conspexisset, exercitu suo præsente conclamauit quid ad se uenirent. ¶ Conclamare uasa,militaris est locutio,pro denunciare inter milites, ut uasa colligant:quod fiebat quum exercitus moturus erat castra. ἀναζυγὴν σημαίνειν. Cæsar lib. 1. bell. Ciu. Quo cognito,signum dari iubet,& uasa militari more conclamari. ¶ Cõclamatum est,hoc est,transactum & finitum est. πέπρακται. { Ital. Egli è finito. Gall. Tout est fait. Hisp. Le cosa esta acabada. Germ. Die sach ist schon vber hin,es ist schon beschehen. } Quod locutionis genus ab ijs tractum putatur,qui morientibus assistũt Solent enim illi cadauerum recens exanimatorum faciem identidem frigida abluere,nomenq; eorum clara uoce inclamare,ne fortè syncope correptos pro mortuis funerarent. Nam qui animi deliquium patiuntur, mortuis similimi sunt:unde & nonnullos pro mortuis claros,& à rogo relatos accepimus. Quum itaq; affusa subinde frigida,nomineq; sæpius inclamato nihil proficeretur,post ultimam conclamationem re iam desperata comburebãtur. ¶ Hinc corpora conclamata dicuntur, hoc est, deplorata, quibusq; extremum hoc conclamationis præstitum est officium. Luca. -corpora nondum Conclamata iacent.

Conclamatio,onis,uerbale καταβοὴ,καταβόησις. { Ital. Crido di piu genti. Gall. Cri de plusieurs gens. Hispan. Aquello llamado con bozes. Ger. Das zůsammen schreien viler. } Clamor multorum Seneca quum aliqua conclamatio est quomodo exeat, non quid efferat,quærit.

Figure 9: Extract from a 1550 Basel edition of Calepino

Not only did Calepino's work become the common property of Europeans in many different editions; Calepino's very surname also passed into the vocabulary of Italian, French, English, and other languages. In the 16th and 17th centuries, Italian ***calepino*** and English ***calepin*** were used as generic terms for a dictionary. In French, ***calepin*** was further extended to mean a

notebook or a compilation of rare and unusual linguistic facts, and was used in various colloquial expressions such as *mettez cela sur votre calepin* 'add that to your calepin'. Watson (1908) and Starnes (1955) showed that a 'calepin' was a widely available - and widely used - resource in schools and universities throughout England in the 16th century. ***Calepine*** was also adopted by Edmund Spenser as a proper name for an allegorical character in the *Faerie Queene*, the significance of which is discussed by Fried (2007) in an article that contains a remarkably illuminating account of Renaissance lexicography.

There were some exceptions to all this polyglottalism. Caxton printed a short, practical French-English vocabulary in 1480, but this is a comparatively minor work. An Italian-German thematic dictionary, *Introito e porta,* was compiled by Adam von Rottweil as early as 1477. It stands at the head of a long tradition, comprising 89 separate publications between 1477 and 1636.

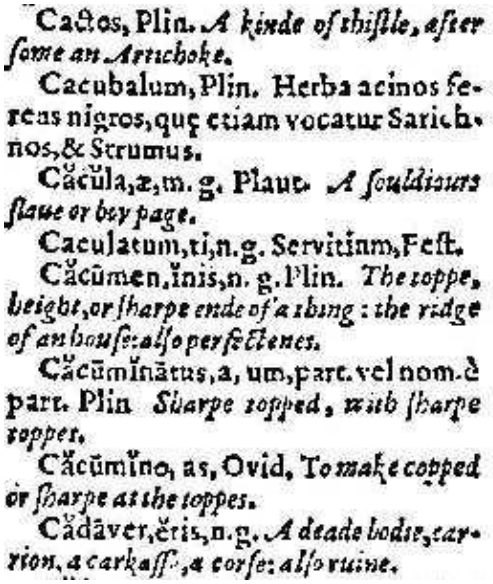
6. Dictionaries in 16th-century England

The Renaissance dictionaries discussed in the preceding sections bore rapid fruit in England, in the first place as a source for the first printed Latin-English dictionary in England, the *Dictionary* of Sir Thomas Elyot (1538) (Figure 10). Unlike *Promptorium Parvulorum*, this was a work for decoding use, as was its most important successor, the *Dictionarium Linguae Latinae et Anglicanae* (1587), compiled and printed by Thomas Thomas, printer to the University of Cambridge (Figure 11). This latter work enjoyed tremendous success for several decades. It is admirably succinct and practical. The English glosses in it are full and informative. As printer to the University of Cambridge, Thomas Thomas was well aware of the needs of students and was at pains to provide them with help in the form of systematic but succinct glosses in their own native tongue.

Typographically, Elyot's work is very obviously indebted to the medieval tradition of Pynson, Caxton, and Gutenberg, whereas Thomas's work of fifty years later is very much more legible. It owes much to the Renaissance typographical tradition of Estienne, Aldus Manutius, and Jenson - though it must be said that it seems sadly debased compared with the beautiful clean lines of Jenson's original Venetian Old Style. Neither the Parisians of the 16th century nor the Elizabethans in England could resist a flourish - literary or typographical.

A batis, two wordes made of the prepoſi=
tion, a, & the ablatiue caſe plurell of Batus,
whiche in englyſſhe is a meaſure, ſignifieth
an officer, that hath the orderyng of mea=
ſures, as a clerke of the markette
Ab accidentibus, an officer, vnto whome it
belõgeth to write ſuch thing⁹ as do chance.
Abacti, officers depoſed, or ſuch as be con=
ſtrayned to reſygne their authoritie.
Abactores, theues that ſteale cattell.
Abacus, a countyng table, or cupboarde.

Figure 10. Extract from the *Dictionarium* of Sir Thomas Elyot, 1538



Cactos, Plin. *A kinde of thiſtle, after ſome an Artichoke.*

Cacubalum, Plin. Herba acinos ferens nigros, quę etiam vocatur Sarichnos, & Strumus.

Căcŭla, æ, m. g. Plaut. *A ſouldiours ſlaue or boy page.*

Caculatum, ti, n. g. Seruitium, Feſt.

Căcūmen, ĭnis, n. g. Plin. *The toppe, height, or ſharpe ende of a thing: the ridge of an houſe: alſo perfectenes.*

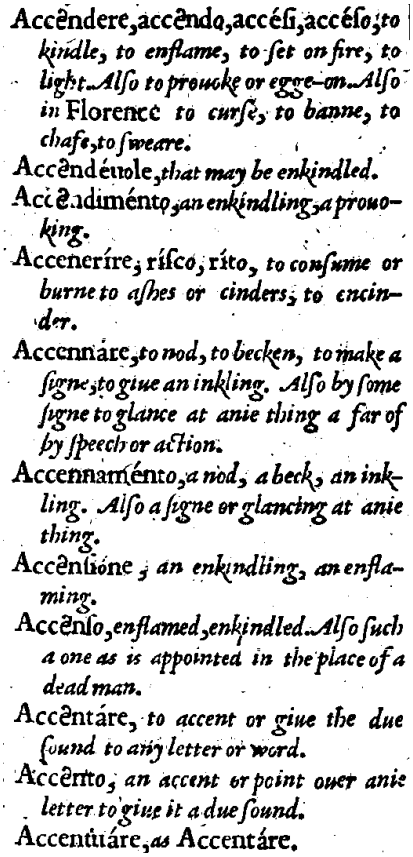
Căcūmĭnātus, a, um, part. vel nom. ę part. Plin. *Sharpe topped, with ſharpe topper.*

Căcūmĭno, as, Ouid. *To make copped or ſharpe at the toppes.*

Cădāver, ĕris, n. g. *A deade bodie, carrion, a carkaſſe, a corſe: alſo ruine.*

Figure 11. Extract from Thomas' *Dictionarium Linguae Latinae et Anglicanae*, 1589

Finally, in this brief survey of dictionaries before Cawdrey, we come to the evolution of bilingual dictionaries proper. Two such works are well known to students of Shakespeare: John Florio's *Italian and English Dictionary* of 1598 and John Minsheu's *Dictionarie in Spanish and English* of 1599. Both of these are practical works for the emerging modern world, designed as aids for translation between contemporary languages. Minsheu's work was an expanded version of an earlier work called *Bibliotheca Hispanica* (1591), compiled by by Richard Percyvall. Along with Palsgrave for English-French, these are the precursors of modern bilingual dictionaries.



Accẽndere, accẽndo, accẽſi, accẽſo; *to kindle, to enflame, to ſet on fire, to light. Alſo to prouoke or egge on. Alſo in* Florence *to curſe, to banne, to chafe, to ſweare.*

Accẽndẽuole, *that may be enkindled.*

Accẽndimẽnto, *an enkindling, a prouoking.*

Accenerire, riſco, rito, *to conſume or burne to aſhes or cinders, to encinder.*

Accennare, *to nod, to becken, to make a ſigne, to giue an inkling. Alſo by ſome ſigne to glance at anie thing a far of by ſpeech or action.*

Accennamẽnto, *a nod, a beck, an inkling. Alſo a ſigne or glancing at anie thing.*

Accẽnſione, *an enkindling, an enflaming.*

Accẽnſo, *enflamed, enkindled. Alſo ſuch a one as is appointed in the place of a dead man.*

Accẽntare, *to accent or giue the due ſound to any letter or word.*

Accẽnto, *an accent or point ouer anie letter to giue it a due ſound.*

Accentuare, *as* Accentare.

Figure 12. Extract from Florio, 1598

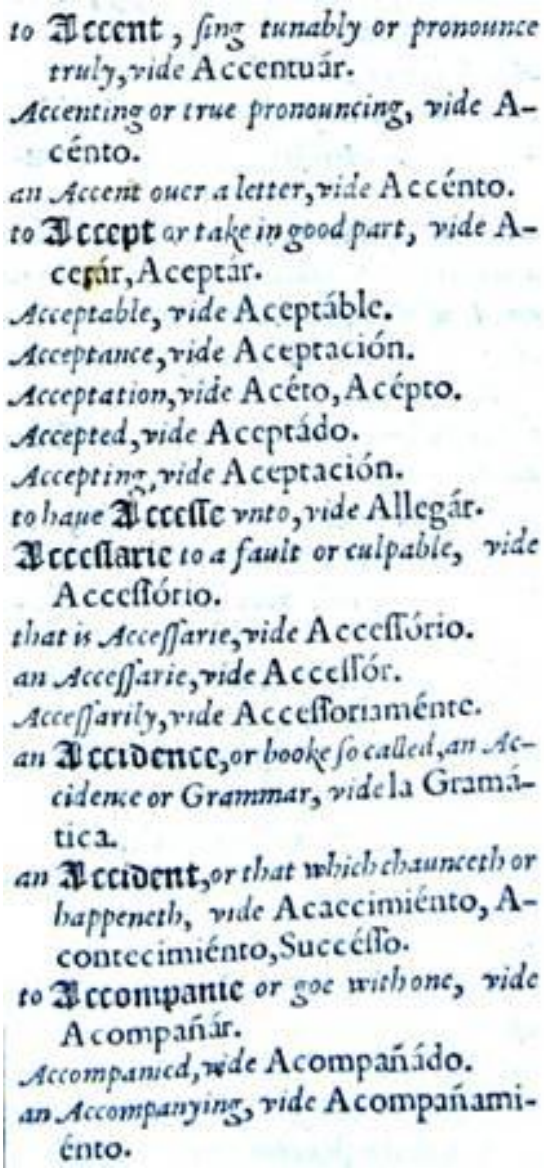

to Accent, ſing tunably or pronounce truly, vide Accentuár.
Accenting or true pronouncing, vide Acénto.
an Accent ouer a letter, vide Accénto.
to Accept or take in good part, vide Acceptár, Aceptár.
Acceptable, vide Aceptáble.
Acceptance, vide Aceptación.
Acceptation, vide Acéto, Acépto.
Accepted, vide Aceptádo.
Accepting, vide Aceptación.
to haue Acceſſe vnto, vide Allegár.
Acceſſarie to a fault or culpable, vide Acceſſório.
that is Acceſſarie, vide Acceſſório.
an Acceſſarie, vide Acceſſór.
Acceſſarily, vide Acceſſoriaménte.
an Accidence, or booke ſo called, an Accidence or Grammar, vide la Gramática.
an Accident, or that which chaunceth or happeneth, vide Acaecimiénto, Acontecimiénto, Succéſſo.
to Accompanie or goe withone, vide Acompañár.
Accompanied, vide Acompañádo.
an Accompanying, vide Acompañamiénto.

Figure 13. Extract from Minsheu, 1599

Minsheu was to go on to compile *The Guide into Tongues* (*Ductor in linguas*, 1617), an ambitious polyglot work in eleven languages. It would no doubt be an interesting research topic to determine the debt of Minsheu to Calepino. This, however, lies outside the period and the scope of the present study.

Despite the efforts of Palsgrave (1530), It was not until the 1590s that the European intelligentsia realized that it was not necessary to use Latin as an interlingua or reference point, on the model of the multilingual dictionaries published under the name of Calepino, in order to translate words and phrases of one vernacular language into those of another. The first French-German / German-French dictionary was published in 1596 by Levinus Hulsius in Nürnberg. He also compiled the first Italian-German / German-Italian dictionary. Other bilingual dictionaries of vernacular languages were to follow thick and fast during the 17th century.

These dictionaries contributed to the internationalization of European culture, making the literature and culture of countries such as Italy and France accessible to speakers of remoter northern languages such as English.

7. Conclusion and a modern analogue

In this paper I have identified three themes in Renaissance lexicography: the preservation and dissemination of the classical heritage; the creation of practical tools for students of Latin and Greek; and the emergence of bilingual dictionaries as practical aids for translation among vernacular languages. None of this would have been possible without the invention of printing technology and the creation of type fonts that make economic and elegant use of space on the page.

I have argued that histories of English lexicography such as Landau (2001) need to pay more attention to the formative influences of the great Latin dictionaries of the 16th century. Studies by scholars such as Armstrong, Bately, and Considine provide an important perspective. A curious fact is that much 16th-century European lexicography used Latin as an interlingua, so that it took several decades for genuine bilingual lexicography to emerge, apart from a few pioneering works such as Palsgrave (1530).

A modern analogue suggests itself, namely that of the development of computer technology in the second half of the 20th century, which could be (or should be) having an impact on present-day lexicography that is as profound as was the development of printing technology in the 15th century. The full possibilities are only just beginning to be worked out. There are at least four aspects:

1. **Evidence.** Just as the Renaissance programme of collecting, printing, and publishing the texts of classical antiquity led to major, technologically innovative dictionaries of Greek and Latin, so the advent of electronic corpora and internet search engines have opened up possibilities for new lexicographic descriptions of phraseology and meaning in contemporary languages.

2. **Resources.** For Renaissance lexicographers, newly printed copies of classical texts served as resources to be quarried for the lexis of Latin and Greek. At present, a plethora of electronic resources, of variable quality and accuracy, for NLP and AI applications are being developed for modern languages. One only needs to look at the Global WordNet Programme, to see an example. It remains to be seen who will be the Robert Estienne of the 21st century and how he or she will present the lexicons of modern languages for a new generation of users, which will include machines as well as humans.

3. **Compilation.** In the 16th century, the index card was invented, and used to compile lexicographical information and sort data into alphabetical order. Now, the computer has freed lexicographers from the tyranny of alphabetical order.

4. **Dissemination.** The invention of printing enabled the rapid reproduction of large numbers of copies of large, complex texts in legible print. This was to be an essential component of lexicography for the ensuing 500 years. At the present time, this whole technology is being superseded by on-line dissemination of information. The waters are muddy and a business model has not yet clearly emerged. But the potential is tremendous. It has hardly begun to be tapped.

References

Dictionaries

Calepino, Ambrogio. (1502). *Dictionarium*. Reggio nell'Emilia. Very many subsequent editions and multilingual elaborations were compiled and printed in numerous European cities.

Cawdrey, Robert. (1604). *A Table Alphabeticall of Hard Usual English Words* ... London.

Dasypodius, Petrus (Peter Hasenfus). (1535-36). *Dictionarium latinogermanicum et vice versa germanicolatinum.* Strasbourg.

Elyot, Sir Thomas. (1538). *Dictionary* [Latin-English Dictionary]. London: printed by Thomas Berthelet.

Estienne, Robert. (1531). *Dictionarium*. Paris.

Estienne, Robert. (1536). *Dictionarium, seu Thesaurus Linguae Latinae*. Paris.

Estienne, Robert. (1539). *Dictionnaire francoislatin.* Paris.

Estienne, Robert. (1552). *Dictionarium Latino-Gallicum.* Geneva.

Estienne, Henri II. (1572). *Thesaurus Linguae Graecae*. Paris.

Florio, John. (1598). *A Worlde of Wordes, or most copious and exact dictionary in Italian and English*. London: printed by Arnold Hatfield for Edw. Blount.

Galfridus Anglicus (alias Galfridus Grammaticalus; Geoffrey the Grammarian). (c. 1440). *Promptorium Parvulorum* ['The Young Person's Storeroom']. Printed in 1499 by Richard Pynson and subsequently by others.

Hulsius, Levinus (Levin van Hulse). (1596). *Dictionaire* [sic] *François-Allemand* [French-German dictionary]. Nürnberg.

Maaler, Josua. (1561). *Die Teütsch Sprach: Dictionarium latinogermanicum novum.* Zürich.

Minsheu, John. (1599). *Dictionarie in Spanish and English.* London.

Palsgrave, John. (1530). *Lesclaircissement de la langue francoyse*. London.

Rottweil, Adam von. (1477). *Introito e porta.* [Italian-German thematic dictionary]

Thomas, Thomas. (1587). *Dictionarium Linguae Latinae et Anglicanae*. Cambridge.

Torrentius, Hermann (Hermann van Beck). (1498). *Elucidarius carminum et historiarum vel vocabularius poeticus.* Deventer.

Van der Schueren, Gherard. (1477). *Vocabularius qui intitulatur theuthonista vulgariter dicendo Duytschlender.* [Dutch-Latin, Latin-Dutch glossary]. n.p.

Other works

Armstrong, Elisabeth. (1954). *Robert Estienne, Royal Printer: an Historical Study of the elder Stephanus*. Cambridge University Press.

Bately, Janet. (2009). 'Bilingual and multilingual dictionaries of the Renaissance and early seventeenth century'. In: Cowie, A. P. (ed., 2009). *The Oxford History of English Lexicography.* Oxford University Press. Vol. 1. 41-64.

Burke, Peter. (2002). *Languages and Communities in Early Modern Europe* (the Wiles Lectures, Queen's University, Belfast). Cambridge University Press

Considine, John. (2008). *Dictionaries* in *Early Modern Europe: Lexicography and the Making of Heritage*. Cambridge University Press.

Cowie, A. P. (ed., 2009). *The Oxford History of English Lexicography.* Oxford University Press.

Eisenstein, Elizabeth L. (1979). *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early-Modern Europe.* Cambridge University Press

Fried, Daniel. (2007). 'Defining Courtesy: Spenser, Calepine, and Renaissance Lexicography'. In *Review of English Studies* 58. 235.

Hausmann, Franz-Josef. (1984). 'Das erste französisch-deutsch Wörterbuch: Levinus Hulsius' *Dictionnaire* von 1596-1607'. In *Zeitschrift für romanische Philologie* 100 (3-4). 306–320.

Korshin, Paul J. (1974). 'Johnson and the Renaissance Dictionary'. In *Journal of the History of Ideas* 35. 2.

Kramer, U. (2006). 'German Lexicography'. In K. Brown (ed.). *Encyclopedia of Language and Linguistics,* 2nd edition. Elsevier.

Labarre, Albert. (1975). *Bibliographie du Dictionarium d'Ambrogio Calepino*. Baden-Baden.

Lancashire, Ian. (2006). 'Computing the Lexicons of Early Modern English.' In Renouf, A.; Kehoe, A. (eds.). *The Changing Face of Corpus Linguistics*. Rodopi.

Landau, Sidney I. (2001). *Dictionaries: The Art and Craft of Lexicography*, 2nd edition. Cambridge University Press.

Murray, James A. H. (1900). *The Evolution of English Lexicography*. The Romanes Lecture. Oxford: Clarendon Press.

Schoonheim, T. H.; Pijnenburg, W. J. J. (2006). 'Dutch Lexicography'. In Brown, K. (ed.). *Encyclopedia of Language and Linguistics*. 2nd edition. Elsevier.

Starnes, DeWitt T.; Talbert, Ernest W. (1955). *Classical Myth and Legend in Renaissance Dictionaries*. University of North Carolina Press.

Starnes, DeWitt T. (1963). *Robert Estienne's Influence on Lexicography*. Texas University Press.

Stathi, Ekaterini. (2006). 'Latin Lexicography'. In K. Brown (ed.). *Encyclopedia of Language and Linguistics*, 2nd edition. Elsevier.

Trench, Richard Chenevix. (1858). 'On some deficiencies in our English dictionaries'. In *Proceedings of the Philological Society*.

Watson, Foster. (1908). *The English Grammar Schools to 1660: their Curriculum and Practice.* London, reprinted 1968.

[Anon.]. (1554). *A Very Profitable Book to Learn the Manner of Reading, Writing and Speaking English and Spanish.*