Collectors' Knowledge: What Is Kept, What Is Discarded

Aufbewahren oder wegwerfen – Wie Sammler entscheiden

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STORING TO KNOW: KONRAD GESSNER'S *DE ANIMA* AND THE RELATIONSHIP BETWEEN TEXTBOOKS AND CITATION COLLECTIONS IN SIXTEENTH-CENTURY EUROPE

Anja-Silvia Goeing

1. *Does Gessner's Repetitorium Reduce the Amount of Gathered Information on* De Anima*?*

When Konrad Gessner wrote his Zurich textbook on book 2 of the Aristotelian doctrine of the soul in 1563,[1] the structure of this 232-page work was important for him as an aid for the students reading it. This is documented in his final note, in which he states that his book will not need an index because it is well organised and therefore does not need auxiliary material for reading.[2] Gessner's textbook on *De Anima* is part four of a collected volume, edited by Gessner himself. Other than the work by Gessner, it also reprints three already published books on *De Anima*, written by contemporaries in the sixteenth century, and Gessner's comprehensive index of these three volumes. The authors are the Wittenberg reformer Philipp Melanchthon (book first published in 1540), his Catholic respondent Vitus Amerbach (book first published in 1542) and the humanist Juan Luis Vives (book first published in 1538).[3] Gessner's book was addressed to students of physics, philology and medicine. It was created in conjunction

[1] Konrad Gessner, *De Anima liber, sententiosa breuitate, velutique per tabulas et aphorismos magna ex parte conscriptus, philosophiae, rei medicae ac philologiae studiosis accomodatus: in quo de tactilibus qualitatibus, saporibus, odoribus, sonis, et coloribus, copiose accurateque tractatur* (Zurich: Jacob Gessner, 1563). Gessner's opus starts on page 719 and ends on page 951.

[2] Ibid., 952: 'Nam e Conradi Gesneri de anima libro, quod is breuior sit, et ordine commodo facilique, conditur, indici quicquam addere non visum est necessarium.'

[3] Juan Luis Vives, Vitus Amerbach, Philipp Melanchthon, Konrad Gessner, *Ioannis Lodovici Vivis Valentini de Anima et vita Libri tres. Eiusdem Argumenti Viti Amerbachii de Anima Libri IIII, Philippi Melanthonis Liber unus. His accedit nunc primum* CONRADI GESNERI DE ANIMA *liber, sententiosa breuitate, velutique per tabulas et aphorismos magna ex parte conscriptus, philosophiae, rei medicae ac philologiae studiosis accomodatus: in quo de tactilibus qualitatibus, saporibus, odoribus, sonis, et coloribus, copiose accurateque tractatur* (Zurich: Jacob Gessner, 1563). Emphasis: ASG.

First editions are: Juan Luis Vives, *Ioannis Lodovici Vivis Valentini, de Anima et vita Libri tres. Opus insigne, nunc primum in lucem editum. Rerum et uerborum in ijsdem memorabilium copiosißimus Index* (Basel: Robert Winter, 1538). Philipp Melanchthon, *Commentarius*

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with efforts to reorganise the Zurich Lectorium in 1559 in line with new ideas about teaching and administration.[4] Among other things, these innovations called for the professor of physics to compile his introductory texts himself.[5] From 1541 until his death in 1565, Konrad Gessner was not only a town physician in Zurich, but also the only professor of natural philosophy at the Zurich Lectorium, where he also taught Aristotelian ethics from 1548 to 1559.[6] Zurich students attended his course on the soul at the age of around sixteen, after they had successfully passed the Latin school, which consisted of five forms, and had been accepted into the Lectorium to undertake further studies in rhetoric, dialectic, Greek, natural philosophy, ethics and, in particular, theology.[7] Gessner's commentary consists of a general introduction to contemporary theses on the soul and leads to a discussion of the senses. Of the internal and external senses that Gessner classifies according to his own criteria, the five external senses—the sense of touch, taste, smell, hearing and sight—are given especially extensive treatment (in the order named here) in their own chapters.[8] Since, in the secondary literature on the history of knowledge and scholarship, Gessner's encyclopaedias serve to show the foundations of con-

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de Anima (Strasbourg: Müller, Kraft, 1540). Vitus Amerbach, *Viti Amerbachii quatuor Libri de Anima* (Strasbourg: Müller, Kraft, 1542).

[4] Ulrich Ernst, *Geschichte des zürcherischen Schulwesens bis gegen das Ende des sechzehnten Jahrhunderts.* Diss. phil. (Zurich: Winterthur, 1879), 102. The school regulations of 1559/1560 are kept in one copy at the Zurich Staatsarchiv (StAZ, Public Records Office) with the signature and folio no. MS E II 476, 5r–18v. In the margins, the archivist has noted that the original was in Bullinger's chronicle. The original is now lost. Other new administrative measures were the school records, kept from 1560, and the yearly election of an administrative head of the school (STAZ E II 458).

[5] StAZ, E II 476 (Zurich School Regulations), fol. 13r: 'Von dem Professore physico. / Derselbig Professor soll im selbs stellen ein Cursum / oder Compendium der fürnemsten Stucken physices / oder wo von anderen gelehrten ein ordenlichen gnug- / samer und wäsentlicher Cursus vorhin gstelt wäre, / ihn und seinen Auditoribus erwehlen, und densel- / bigen zu seiner stund alle jahr von einem Examen / zum anderen, so vil möglich außlesen.'

[6] Anja-Silvia Goeing, '"Physica" im Lehrplan der Schola Tigurina 1541–1597', in *Anfänge und Grundlegungen moderner Pädagogik im 16. und 17. Jahrhundert*, ed. Hans-Ulrich Musolff and Anja-Silvia Goeing, 73–91 (Cologne: Böhlau, 2003). The research biography of Gessner has now been enhanced by the reconstruction of the library books owned by Konrad Gessner: Urs B. Leu, Raffael Keller and Sandra Weidmann, *Conrad Gessner's Private Library*, History of Science and Medicine Library 5 (Leiden: Brill, 2008).

[7] Ernst, *Geschichte des zürcherischen Schulwesens* (1879), 107: The average age of the students enrolled in the Lectorium was sixteen to twenty. Ernst refers to the matriculation lists to verify his statement.

[8] Gessner, *De Anima* (1563), 798–830 (De Tactu), 831–839 (De Gustatu), 840–880 (De Odoratu), 880–925 (De Auditu), 926–951 (De Visu).

temporary organisations of knowledge,[9] and since Gessner's *De Anima* consists mainly of all kinds of lists, organised under headings to illustrate overarching points of view, *De Anima* deserves more extensive investigation. With the help of Gessner's textbook, it is possible to identify relations between collections of citations—so-called commonplace books or collections of *loci communes*—and textbooks in the sixteenth century.

The article is arranged as follows: After a discussion of the secondary literature on teaching and learning and an introduction to the idea of the *loci* collections, which focuses on *De Copia* by Erasmus, I will discuss whether or not Gessner's *De Anima* is a printed form of commonplace book. Passing over the question of how Gessner's references to Aristotle's *De Anima* connect to his general aims of including the object world in his research, I will address the question of the text's relations to the aims of instruction. I would like to show first that Gessner's *De Anima* is a so-called printed commonplace book or collection of *loci* and that it is therefore part of a specific tradition with rhetorical roots. Gessner himself assigns his book the function of a *repetitorium* (review book) and thus alludes to the field of applied mnemotechnics, or the art of memory. Teaching and learning in this case comes to connect his commentary on Aristotle with developments in the field of rhetoric. These developments consist mainly in the collection of *loci*, or commonplaces. In the final analysis, they go back to the reception of textbooks that were widely read in the Middle Ages: *Rhetorica ad Herennium*, Cicero's early work *De invention*, and the *Progymnasmata*, written by the Greek orator Aphthonius (preliminary exercises of rhetoric) in the fourth century.[10] I would also like to show that the 'information overload' in encyclopaedias and abridged textbooks that followed the rules of certain kinds of commonplace books is only one side of the coin if one wants to understand Gessner's Cosmos. Unlike his unloved colleague at Paris, Petrus Ramus, Gessner combined the organisation of concepts with informed self-study and anatomical considerations.

I am referring to the very large amount of collected data and information made up of Gessner's quotes from other books. There are two

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[9] Compare: Helmut Zedelmaier, *Bibliotheca Universalis und Bibliotheca Selecta: Das Problem der Ordnung des gelehrten Wissens in der frühen Neuzeit* (Cologne: Böhlau, 1992); Brian W. Ogilvie, *The Science of Describing: Natural History in Renaissance Europe* (Chicago and London: The University of Chicago Press, 2006), passim (indications gathered in the book's index on p. 375).

[10] Edgar Mertner, 'Topos und Commonplace', in *Toposforschung*, Respublica Literaria 10, ed. Peter Jehn, 20–73 (Frankfurt am Main: Athenäum, 1972), here 26–27, 33–34.

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distinct contexts for these quotes that offer the basis for comparisons. In order to learn more about keeping and discarding traditions in this particular example of making a textbook, it is helpful to compare Gessner's citations with his citations in his other works on the same topic. First, these are from his encyclopaedias. Expositions on the subject *De Anima* are in his *Pandecta* of 1548. This is a collection of bibliographic information, drawn from the entire history of books from antiquity to his time, that covers a tremendously long list of topics. Secondly, Gessner has left notes. His former student and successor in office at the Schola Tigurina, Caspar Wolf, published them under the title *Meditationes Physicarum* long after Gessner's death in 1586. There the treatise of Aristotle's *De Anima* is placed in the context of the contemplation of Aristotelian physics in its entirety.

The second context in which we can place Gessner's textbook is that of sixteenth-century *De Anima* commentaries and editions circulating within and outside the confessional borders of Europe. The three other treatises that Gessner edited together with his own contribution form a core reference group. For this 1563 edition, Gessner took up and extended a textbook edited by the Basel publishing house Oporinus for the University of Basel in 1560. It consists of the three aforementioned textbooks, Melanchthon, Amerbach's response and Vives' foundations.[11] The question arises as to the interconnections with other textbooks for *De Anima* in Europe. Were they created differently for different sorts of students, for example, the students of Latin school and students of the university? Analyses and comparisons will help to classify Gessner's collection and answer the question of whether or not he accumulates the greatest possible number of fragments of knowledge in a certain *loci* arrangement, which citations he left aside and why he did so. The results promise to shed additional light on the use and character of a *repetitorium*: Did Gessner

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[11] Juan Luis Vives, Vitus Amerbach and Philipp Melanchthon, *Ioannis Lodovici Vivis Valentini De Anima et Vita Libri Tres. Eiusdem Argumenti. Viti Amerpachii De Anima Libri Iiii. Philippi Melanthonis Liber Unus. Ex Ultima Autorum Eorundem Recognitione* (Basel: Oporinus, 1560).

Other Editions include: Juan Luis Vives, Philipp Melanchthon and Senator Cassiodorus, *Ioannis Lodovici Vivis Valentini De Anima et Vita Libri Tres, Opus Insigne, Nuncq; Denuo Quàm Diligentißimè Excusum. Accesserunt Eiusdem Argumenti De Anima, Philippi Melanchthonis Commentarius, et Magni Avrelii Cassiodori Senatoris Liber Unus. Rerum Et Verborum in Ijsdem Memorabilium Copiosißimus Index* (Basel: Winter, 1543).

The fact that Gessner adds his own contribution on top of this already existing textbook suggests a connection between the teaching of physics at the two institutes of higher education in Zurich and Basel.

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have a specific reduction of information in mind when he planned school material?

2. *Keeping and Discarding in Citation Collections of the Sixteenth Century: The State of the Art*

Only in very recent times have the organisational forms of citational knowledge practices in the sixteenth century become the subject of independent research on the history of knowledge.[12] In her dissertation *The Theater of Nature: Jean Bodin and Renaissance Science*, Ann Blair, working with the *Universae Naturae Theatrum* by Jean Bodin (1596), draws attention to structures in the text that allow one to assume that texts from old and ancient books had been 'dissected'.[13] In her recent book *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven, 2010), she builds on this thesis: she describes a common increase of circulating pieces of information that are caught and fitted into new categorical systems. The technique of note-taking is one of the most widely applied and individually formed scholarly practices. The most important survey of the different fields in which the *loci* collections were applied is provided by Ann Moss in her 1996 book *Printed Commonplace-Books and the Structuring of Renaissance Thought*.[14] As Moss observes, the works by classical authors that were nearly untouchable in scholastic and early humanism, first and foremost those of Cicero and Aristotle, were dissected in the second half of the fifteenth century, especially in schools in which students were made to memorise adaptable phrases. Single sentences were removed and organised under headings in collections of quotations.

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[12] Ann Blair, 'Humanist Methods in Natural Philosophy: The Commonplace Book', *Journal of the History of Ideas* 53 (1992): 541–551, http://www.jstor.org/stable/2709935. Brian W. Ogilvie, 'The Many Books of Nature: Renaissance Naturalists and Information Overload', *Journal of the History of Ideas*, 64 (2003), 29–40, http://www.jstor.org/stable/3654294. Zedelmaier, *Bibliotheca Universalis und Bibliotheca Selecta* (1992). Ann Blair, 'Reading Strategies for Coping with Information Overload Ca. 1550–1700', *Journal of the History of Ideas* 64 (2003): 11–28, http://www.jstor.org/stable/3654293. Richard Yeo: 'A Solution to the Multitude of Books: Ephraim Chambers's 'Cyclopaedia' (1728) as "The Best Book in the Universe" (in Early Modern Information Overload)', *Journal of the History of Ideas* 64, no. 1 (2003): 61–72. Richard Yeo: 'Ephraim Chambers's Cyclopedia and the Tradition of Commonplaces', *Journal of the History of Ideas* 57, no. 1 (1996): 157–175.

[13] Ann Blair: *The Theater of Nature: Jean Bodin and Renaissance Science* (Princeton: Princeton University Press, 1997).

[14] Ann Moss, *Printed Commonplace-Books and the Structuring of Renaissance Thought* (Oxford and New York: Clarendon Press, 1996).

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The generic terms were primarily taken from the works of Aristotle. After that, they were researched individually and, finally, they were applied and organised by means of new, highly thought-out approaches to dialectic, as in the work of the Wittenberg scholar Philipp Melanchthon and the Paris professor Petrus Ramus. These *loci* collections were started in school and in many cases pursued by the scholar until his old age.

The extensive example of the 1538 school regulations by Johannes Sturm shows that the compilation of quote collections using classical and modern authors and the arrangement of these quotes under headings were part of school exercises designed to train students' memory in the sixteenth century.[15] Whereas in higher classes at school the analysis and formulation of orations was the focus of exercises,[16] the *septima*, or third form, was dedicated to training memory by creating *loci* collections under sensible generic terms starting with God, moving to the human being and, finally, incorporating the world of lifeless objects. The *loci*, or terms used, are taken from the works of classical literature, especially those by Virgil. When Johannes Sturm wrote his work on education and had it printed, no classes were taught in his school that used commonplace books as a method. The textbooks did not consist of collections of quotations, but of the classical texts themselves, which Sturm explained in notes dealing with difficult words in the text. This is known to us from lecture transcriptions made by his students.[17] It would be interesting to learn how students in later times—from the 1560s on—were taught to work with textbooks in Strasbourg. These textbooks contained quotation collections, which meant that the students did not have to do any more collecting themselves.

Explanations of the emergence of printed commonplace books in the second half of the sixteenth century in Zurich and how these influenced the reception of texts have so far not been given in the secondary literature: not by Ann Moss or by others after her, be it about single authors, who collect *loci* as explained by William Sherman in the recently published book *Used Books: Marking Readers in Renaissance England*,[18] or be

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[15] Moss, *Printed Commonplace-Books* (1996), pp. 147–155.

[16] Lewis W. Spitz and Barbara Sher Tinsley: *Johann Sturm on Education: The Reformation and Humanist Learning* (St. Louis: Concordia, 1995), 97–101.

[17] Compare: Anja-Silvia Goeing, 'Martin Crusius' Verwendung von Notizen seines Lehrers Johannes Sturm', in *Johannes Sturm (1507–1589): Rhetor, Pädagoge und Diplomat*, ed. Matthieu Arnold, 239–260 (Mainz: Mohr Siebeck, 2009).

[18] William H. Sherman, *Used Books: Marking Readers in Renaissance England* (Philadelphia: University of Pennsylvania Press, 2008).

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it—as in an article by Urs Leu—about the collections of *loci* in Zurich connecting this method with the general reception of Erasmus in Zurich.[19] Although Moss states that the later use of structured and printed commonplace books in schools from 1560 onwards was frequent, she does not describe their different function, which could not have consisted (at least insofar as the book was in the hand of students, not of teachers) in the compilation of commonplace words, since these compilations were already made. For this reason she also does not discuss the status of *repetitoria* or exercises in class. In his 2007 book *Commonplace Learning: Ramism and its German Ramifications, 1543–1630*, which treats *loci* collections as Petrus Ramus and his followers have thought about them,[20] Howard Hotson refers to one case in 1582 at the University of Leiden in which six students requested that they be allowed to read Aristotle in the original and without Ramus's compendia. The senate accepted their petition and reintroduced the unabridged lecture of Aristotle in class. The theoretical or pedagogical motives for the debate are not reported.

Lina Bolzoni's book, published in 1995 under the title *La stanza della memoria*[21] and translated into English in 2001, explores the struggle in academia between the search for eloquence, the need for rote learning and the short way to a good appearance via rhetoric formula, the use of seemingly erudite, but hollow and meaningless phrases. Bolzoni illustrates her first chapter with a tree diagram that rhetoric professor Francesco Robortello produced for the Accademia Veneziana. He used the diagram to represent visually his course on rhetoric at this institution. Robortello published the diagram in 1549 in Venice with a Latin subtitle that has been translated into English by Bolzoni's translator Jeremy Parzen:

> In hope of a successful result, Francesco Robortello from Udine—who, by order of the scholastic authorities, will teach a course on rhetoric in Venice this year based on the ancient rhetoricians—offers this table to his listeners for their perusal. All things that have to do with the art of speech—from Cicero to Quintilian, Hermogenes, or Aristotle—have been positioned in the places of the table. Anyone can consult it, and thus can know the origin of every question and the heading to which one must refer. In this way,

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[19] Urs B. Leu, 'Aneignung und Speicherung enzyklopädischen Wissens: Die *Loci*-Methode von Erasmus', in *Erasmus in Zürich: Eine verschwiegene Autorität*, ed. Christine Christ-von Wedel and Urs B. Leu, 327–342 (Zurich: Verlag Neue Zürcher Zeitung, 2007).

[20] Howard Hotson, *Commonplace Learning: Ramism and its German Ramifications, 1543–1630* (Oxford: Oxford University Press, 2007), 54–55.

[21] Lina Bolzoni, *La Stanza Della Memoria: Modelli Letterari e Iconografici Nell'Eta Della Stampa* (Torino: Giulio Einaudi, 1995).

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> every time a controversy arises in interpretation, all that can be disputed about it will be readily identifiable in its place.[22]

Robortello suggests that consultation of his table will indicate the terms of the objects that comprise the entire field of rhetoric. Should the listener of his lecture find himself in the predicament of having to compose an oration for a debate, he will have access to the entire contents by following the structure of the headings. The designated fields of reference and the necessary information can be easily identified and found. The table provides quick orientation for students. With this example, Lina Bolzoni shows that students were able to follow the teacher's voice and words at every moment of the lecture by looking at the diagram. Consequently, they were able to find each term easily in the network of relations. Through this method, knowledge could be used again and again without any further input by the student.

Bolzoni's evidence shows how great the didactic distance could be between the students' collection and production of commonplace books, and the teachers' distribution of commonplace books that they themselves had made. Knowledge was handled in quite different ways and with very different goals. In the first case, classical texts and text fragments were mnemonically adapted and accommodated to the proper roster of terms and headings, and in the second there was a ready-made use of arguments or phrases. The recourse to classical texts in the second case was rendered obsolete. Bolzoni does not draw any conclusions from her observation, but moves on to the next point, which concerns the senseless composition of orations by rhetorical machines capable of mixing ready-made phrases in multifaceted variations. She leaves it to the reader to imagine how humanism could develop into mere senselessness, starting with a sage work by authors such as Cicero and Quintilian, moving to *loci* collections and culminating in the preposterous phrase-threshing machine. The school itself is not her subject. The question of *loci* collections in school therefore remains open.

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[22] Lina Bolzoni, *The Gallery of Memory: Literary and Iconographic Models in the Age of the Printing Press*, transl. by Jeremy Parzen (Toronto, Buffalo and London: University of Toronto Press, 2001), 24–25.

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3. *Composition of the Loci Collections: Erasmus'* De Copia

In his 1513 work *De Copia* on the abundance of style,[23] Erasmus of Rotterdam describes two aspects of collecting *loci* in commonplace books: 1) the collection of words (*verba*) or the eloquent and well-chosen expressions used in letters (replacing the collection of formulae used in his times) and 2) the aspect of *res*, which entails explaining what is comprised by an entire proposition or sentence—translatable, perhaps, as 'thought'. Erasmus distinguishes the two areas as follows: In the first part of his book, he recommends that, in order to compose fluent and more eloquent letters, his readers, ideally students of rhetoric, should generate a list of expressions or phrases under headings that would be useful in the future. His many examples in support of his claim can be quite amusing since they show letter headings and salutations developed ad absurdum. The English translation by Betty Knott[24] reads: 'Let us, for example, take this sentence: "Your letter pleased me mightily." ' It is transformed into: 'How delighted I was to read your letter! The perusal of your letter charmed my mind with singular delight.... As a result of your letter I was affected with singular gladness.' The variations end with: 'Could I possibly compare Attic honey with your dear letter?' and 'Your lines seem to me pure enchantment.' In fifty-four variations, Erasmus demonstrates the possibilities of an abundant style, of changing statements in a nuanced way and of expressing the same content with different words.

In the second part of his work, Erasmus expands the application field of the collected examples by adding the world of facts, themes, and modes of argumentation. He calls both parts explicitly 'Verba' and 'Res', the first part 'Verba' due to its emphasis on words and the second part 'Res' due to its concern with concepts.[25] According to Erasmus, in the area of *res*,

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[23] Desiderius Erasmus of Rotterdam, *De Copia*, 2nd ed. (Strasbourg, 1513), 1st book, 7th chapter. I encountered this topic first in a graduate seminary at Princeton University in Winter 2004, held by Anthony Grafton. Since then I have thought about the problem of printed commonplace books as a problem of epistemology in the history of early modern education. See, on Erasmus' variations in *De copia*: Anthony Grafton, 'The Republic of Letters in the American Colonies: Francis Daniel Pastorius Makes a Notebook', *The American Historical Review* 117, no. 1 (February 2012): 1–39, p. 19.

[24] Desiderius Erasmus of Rotterdam: *Literary and Educational Writings 2: De Copia, De Ratione Studii*, Collected works of Erasmus 24, ed. Craig R. Thompson, 348–365 (Toronto, Buffalo and London: University of Toronto Press, 1978). See Grafton, 'The Republic of Letters in the American Colonies: Francis Daniel Pastorius Makes a Notebook', 19.

[25] Ibid., 294: 'Such considerations have induced me to put forward some ideas on copia, the abundant style, myself, treating its two aspects of content and expression, and giving some examples and patterns.'

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students must first examine each of the many examples and possibilities in order to decide how they can formulate the best possible argument and adapt it to the situation. Erasmus concludes that the exercise of collecting and applying these phrases will train the memory over time and enable students to find the correct pattern easily and quickly.

In 1512, Erasmus dedicated *De Copia* to St. Paul's school in London.[26] He had written it long before, but had not yet finished it. He only agreed to have it printed in 1512 in London when faced with the threat of a non-authorised print of one of the associated manuscripts. Enhanced editions were then printed in Strasbourg in 1513 and Basel in 1514. By 1572, as Herbert Rix noted in 1946,[27] there were 150 editions of the book, printed by the famous printing shops of northern Europe, including those in Antwerp, Basel, Leipzig, London, Lyon, Paris, Cologne and Strasbourg. Unfortunately, we do not know how large the print runs of the individual editions were, yet we can assume on the basis of the large number of editions that the book was disseminated throughout Europe. It was also recommended and prescribed for teaching in Zurich. Proof of this can be found in the Zurich school regulations of 1559: Erasmus's *De Copia* was part of the fifth-form's curriculum in the upper Latin school.[28] According to the plan, the book was to be read before Gessner's Aristotelian *physica*, although we do not know if this plan was ever implemented. However, we do know from the study by Urs Leu[29] that there was no great step between the collection of quotes recommended by Erasmus and the registers forming the basis for Konrad Gessner's encyclopaedias. Both are comparable in forming generic terms, but both are not completely the same or perfect mirrors of each other.

The applied method of Erasmus is seen especially in northern Europe, if not as a point of departure, at least as a determined form to gather quotes under headers in notebooks. These notebooks are called *topoi* books, *loci* books or simple commonplace books, according to the kind of collection referring to header terms, the so-called *loci* or *topoi*. They are found in all

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[26] Herbert David Rix, 'The edition of Erasmus' *De Copia*', *Studies in Philology* 43 (1946): 595–618, here 597–598.

[27] Ibid., 604–615.

[28] Zurich School Regulations, fol. 11r–v: 'Die 5. und Oberste Classis is des schulmeisters. der / soll am morgen ein guten graecum authorem lesen, zu / midtag ein Latinum, zu abend prae exercitamenta Rhetorices / und Dialectices, als dann sind Aphtonius, Libri de copia rerum / Erasmi, oder etwas dergleichen, das man je nach gstalt / [11v] der zeiten und knaben übereinkomt.'

[29] Leu, 'Aneignung und Speicherung enzyklopädischen Wissens' (2007).

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fields of knowledge, especially in school. Ann Moss uses the example of the 1538 school treatise 'De literarum ludis recte aperiendis' by Johannes Sturm to show that students were explicitly guided to create notebooks like this.[30] I cite the translation by Lewis Spitz and Barbara Sher Tinsley of 1995:[31]

> These three grades, the ninth, eighth, and seventh, require training the memory.... Even material which they have already learned once must be repeated at brief intervals, often and regularly. The perceptions of the mind become clearer, the faculty of recall becomes brighter, and the discovery and use of each are easier if they may be divided up according to certain common criteria, limb by limb as it were, and by short phrases, and collected under general headings so that what the orderly mind itself can recite from memory, it may also know where to find the same information divided neatly into its basic components. For just as cosmographers' maps which depict the very places we once frequented strongly excite us and enlighten our perceptions, so even desolate expanses are put into order when we grasp them with the mind.

The first three grades, until children reached the age of eight or nine, were mainly dedicated to exercises of the mind. Sturm recommended separating the subject taught by the teacher into small parts, such as sentences, and collecting them under subject headings (*loci*). This division allows students to memorise these sentences, as Robortello suggests in his diagram of 1549 for his rhetoric course at the Accademia Veneziana, however, it rather enables students to keep the sentences and find them again, if necessary. This kind of map, which Sturm asks his students to learn, therefore represents the content of the memory in an ideal form.

We find commonplace or *loci* books en masse in the archives, published from the late sixteenth century onwards. Good examples are the *loci* book by Francis Bacon in London, a collection of interesting sentences without order or headings,[32] and the well-organised topoi book on *physica* from 1598. The latter is held in the Genevan Library with the school papers and personal effects of Théodore Tronchin. Tronchin, who was elected rector of the Genevan Academy twelve years later, was just sixteen when he started the book using quotes from Aristotelian physics, ethics and

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[30] Moss, *Printed Commonplace-Books* (1996), 147–155.

[31] Spitz, Tinsley, *Johann Sturm on Education* (1995), 91.

[32] Francis Bacon, *Francis Bacon's Promus of Formularies and Elegancies, Being a Literal Reprint of Part of the Harleian MS. 7017, in the British Museum, London*, ed. F.B. Bickley (London, 1898), 28 and facsimile, glued in after the title page. Fol. 85 bears the date 1594.

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economics.[33] From the second half of the sixteenth century, the use of *topoi* books with hierarchical heading systems like the one developed by Francesco Robortello was regarded as a trademark of the schools and modes of thought influenced by Ramus, especially in reformed Protestant regions. As Howard Hotson reports,[34] in 1576, the year he was in office, Altdorf rector Johann Thomas Freigius composed and printed these kind of textbooks on all subjects—grammar, rhetoric, dialectic, physics, etc.—according to the innovative ratio of the Paris scholar, Petrus Ramus.

Scholars of dialectic, notably Philipp Melanchthon and Petrus Ramus, engaged in a separate, lively discussion on the compilation of generic terms. Wittenberg professor Philipp Melanchthon altered and reedited his opinion on the connection between rhetoric and dialectic several times between 1520[35] and his death in 1560. In relation to Melanchthon's *loci communes*, Volkhard Wels demonstrates in his 2008 study of *Erothemata Dialectices* that, according to Melanchthon, basic axiomatic sentences of each subject doctrine function as *loci communes*, since they serve 'as the most important foundation for the deduction of specific subordinate clauses'.[36] They therefore demarcate the group of generally accepted true sentences, from which all subordinate clauses are deduced. The content of Melanchthon's book differs from other books on rhetoric: his goal is not to present, under generic terms, an abundance of words and thoughts for memorisation and thus to enable the reader to produce better texts. Rather, he is concerned with introducing and teaching basic theological or foundational sentences. On the other hand, Petrus Ramus, a student of Johannes Sturm and a professor in Paris, began after 1540 to construct his dialetic based on premises from verbal reasoning. Walter J. Ong, whose 1958 book *Ramus: Method and the Decay of Dialogue* continues to be held in high esteem today, describes Ramus's approach as follows: 'The *Training in Dialectic*, from which the later Dialectic emerges, is a curious document

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[33] See Théodore Tronchin, MS Arch. Tr., vol. 32, Bibliothèque universitaire de Genève. See *Catalogue de la partie des archives Tronchin acquise par la Societe du Musee historique de la Reformation* (Geneva, 1946), 83. William A. McComish, *The Epigones: A Study of the Theology of the Genevan Academy at the Time of the Synod of Dort, with Special Reference to Giovanni Diodati*, Princeton Theological Monograph Series 13 (Allison Park, PA: Pickwick, 1989), 32.

[34] Hotson, *Commonplace Learning* (2007), 61.

[35] Philipp Melanchthon, *Compendiaria Dialectices Ratio* (Wittenberg: Lotter, 1520).

[36] Volkhard Wels, 'Melanchthon's Textbooks on Dialectic and Rhetoric as Complementary Parts of a Theory of Argumentation', in *Scholarly Knowledge: Textbooks in Early Modern Europe*, ed. Emidio Campi, Simone De Angelis, Anja-Silvia Goeing and Anthony T. Grafton, 139–156 (Genève: Droz, 2008), here 153.

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and can be described as an attempt to set a vaguely Agricolan dialectic in a Ciceronian psychology, to give it a Platonic surface purportedly in the interests of religion, and to "simplify" the result for reasons of "practice" or pedagogical expediency.'[37] Summarised very briefly, Ramus assumes that the art of dialectic must imitate a natural dialectic or mode of disputing that is open to every school child, even one without training. This natural dialectic has nothing to do with Aristotelian prescripts.[38]

Physician and naturalist Theodor Zwinger was active in Basel in the age of Konrad Gessner. In 1565 he used the approach proposed by Ramus for his tables and diagrams, as Paul Michel discusses extensively in his 2007 essay 'Verzweigungen, geschweifte Klammern, Dezimalstellen: Potenz und Grenzen der taxonomischen Ordnungssystems von Platon über Theodor Zwinger bis Melvil Dewey'.[39] Ironically, Zwinger's tree diagrams do not allow us to retrieve a term once it is stored in the system. Michel shows this using one entry as an example: 'über die Wirkungen der Funktionen des menschlichen Geistes' ('On the effects of the function of the human mind').[40] The diagram belonging to this head row takes up twelve folio pages. The content referred to by the diagram fills the following eighty-four folio pages. The primary *loci* are 'affirmans-negans' (affirmative-negative), 'certa-incerta' (sure-unsure), 'toto-parte' (whole-part), etc. The subordinate terms continue with similar criteria. Examples of *loci* in the middle of the hierarchy are 'simplex-compositer' (simple-composite). Ultimately, any search for terms using these *loci* is doomed to failure. The examples show how the idea of collecting citations as a learning practice in school that became prominent with Erasmus spread out into different kinds of collecting systems and ultimately led to new forms of books. Printed commonplace books can be characterised as an innovative format between

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[37] Walter J. Ong, *Ramus: Method, and the Decay of Dialogue: From the Art of Discourse to the Art of Reason* (Cambridge, Mass: Harvard University Press, 1958; reprint: Chicago: The University of Chicago Press, 2004), 172.

[38] Petrus Ramus and Omar Talon, *Aristotelicae Animadversiones—Dialecticae institutiones* (Paris, 1543; reprinted with an introduction by W. Risse, Stuttgart-Bad Cannstatt: Frommann-Holzboog, 1964). See figure: Petrus Ramus, *Dialecticae libri duo* (Mulhouse, 1586), fol. 42r, compares his method with the one used by Philipp Melanchton.

[39] Paul Michel, 'Verzweigungen, geschweifte Klammern, Dezimalstellen—Potenz und Grenzen des taxonomischen Ordnungssystems von Platon über Theodor Zwinger bis Melvil Dewey', in *Allgemeinwissen und Gesellschaft: Akten des internationalen Kongresses über Wissenstransfer und enzyklopädische Ordnungssysteme, vom 18.–21. September 2003 in Prangins*, ed. Paul Michel, Madeleine Herren and Martin Rüesch, 105–144 (Aachen: Shaker 2007).

[40] Michel, 'Verzweigungen, geschweifte Klammern, Dezimalstellen' (2007), 131–135.

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textbook and treatise. They belong to the sort of books that Ann Blair most generally defines as reference books:[41] encyclopaedic in character, printed commonplace books are erudite and have a capacity to present organised knowledge.

4. Loci *in Gessner's Teaching*

In Zurich there was very little scholarly debate concerning the makeup of *loci*. In his 1548 work *Pandecta*, which contained a collection of bibliographic entries organised according to school or university subjects and their subgroups, Konrad Gessner defines what he understood by the term *loci communes*.[42] As Urs Leu has written,[43] Gessner suggests collecting *loci* and examples according to the method described by Erasmus in the second book of *De Copia*. Gessner provides the reader with an example of these *loci* collections: as he writes in his introduction, *Pandecta* presents a single collection of *loci* arranged by subject and subordinate subject. *Pandecta* is organised as follows: first, the areas of knowledge—beyond school and university subjects—are separated. The subject *Physica* follows an extensive bibliographical description of the subjects *Grammatica* (to f. 42v), *Dialectica* (to f. 48v), *Rhetorica* (to f. 58v), *Poetica* (to f. 72v), *Arithmetica* (to f. 76v), *Geometria* (to f. 80v), *Musica* (to f. 86v), *Astronomia* (to f. 94v), *Astrologia* (to f. 98v), *Divinatione et Magia* (to f. 106v), *Geographia* (to f. 116v), *Historiae* (to f. 164v), and *Artes illiterates* (to f. 180v). *Physica* (to f. 236v) is followed by *Metaphysica* (260v), further Aristotelian writings and the university subjects of medicine, law and theology. Every subject has subordinate *loci* that divide the specific areas. *Physica*, for example, is arranged according to the books by Aristotle. The *Locus* or *Titulus IX* treats *De Anima*. Registers of places were made, ranging from the general to the specific, and the chapter numbers of books are indicated with statements on subordinate topics. Hence 'Hearing' (*De audito*) (213r–213v) is listed with the following information:

[41] Blair, *Too Much to Know* (2010), 1–10.

[42] Konrad Gessner, *Pandectarum sive Partitionum uniuersalium Conradi Gesneri Tigurini, medici et philosophiae professoris, libri XXI* (Zurich: Froschauer, 1548), 24–25.

[43] Leu, 'Aneignung und Speicherung enzyklopädischen Wissens' (2007), 339.

213r

¶De auditu.

De auditu, Plutarchus de Plac. 4.16. Pli

[new column]

nius 7.22. Brusonius 1.17. Lumen animae Tit. 51.
De auribus Problemata Aristotelis, sectione 13.
Aures et auditus, pharetra.
Auditum uisu praestare, Io. Ferrerius.
Auditum et olfactum esse piscibus, Plinius 10.70.
Quomodo audiant odorenturue, quae sensorijs eiusmodi non sunt praedita:
De piscibus qui inclamati ueniunt, Caelius 24.23.
Sonus quomodo illabatur auribus, Caelius 19.14.
De sono auribus incidente, Aelianus in Varijs Graecis, fol 27.
De auditu et uoce: Cur per quae loca ad oculos uenire simulachra non possunt, per ea uoces transmeent, Lucretius libro 4.
Cur noctu sonantius audiantur omnia: Quid palmus, tylae, sigmos, clytos: Cur uox intro delata melius audiatur, quam ediuerso: aradus quid, Caelius 5.10.
Quare nox magis sonora sit quam dies, Plutarch, Symp. 8.3.
Qua ratione echo reddatur, Plinius 2.46. Lucretius libro 4. et Plutarchus de Plac. 4.20.
De echo septies resonante, Plin. 36.15.
Echo in uocem, Ouidius lib. 3. Metam.
Sibylla in uocem, Ouid. lib. 4. Metam.
De ratione uocis et soni, ARistotelis Problemata, sectione 11.65.
De uoce, uide supra libro 5. de Musica, Tit. 2.
Corpus ne sit uox, an incorporea, uarias esse philosophorum sententias, Gellius 5.15. Plutarchus de Plac. 4.20.
De uoce, Plutarch. de Plac. 4.19.
De uocibus, Plinius 11.51.
Cannae uocales, Ouidius lib. II. Metam.
Super uocis ratione adnotata pluscula, deque soni ac uocis interstitio: Pollucis obscuritas illustratur, Caelius 19.13.
Cur ualde dormientium uox grauior, item hyeme, Caelius 30.8.
Cur foeminis atque eunuchis uox sit quam uiris exilior, Macrob. Saturn. 7.10.
Vocis acutae ratio in eunuchis, Cael. 9.12.
Yamae fons canoras reddens uoces, Caelius 19.15.

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Ficos obesse uoci, Caelius 19.14.
Surditas, Index prouerbiorum Erasmi secundum locos.

¶De odoratu.

First the subtopics are given (the first two are *De audito* and *De auribus*), then the author, a short title of the book and the chapter number.

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Gessner does not provide readers of his *Pandecta* with quotes in order to allow them to reconstruct an oration as quickly as possible, as Robortello wanted. Rather, he gives information on the passages in different books to search for. Readers of *Pandecta* are indirectly prompted to search for the quote themselves. They then consult the original text with Gessner's advice, and excerpt the searched-for content. Here the focus is clearly on the engagement with literature, not on the quick re-creation of a piece of writing or oration.

While *Pandecta* works with references to other passages in books, Gessner's *De Anima* is a different type of work: like *Pandecta*, it is a *loci* book, but it can be read without consulting Aristotle's *De Anima*. The structure of Gessner's *De Anima* can hardly be compared to that of *Pandecta*. The main difference is the reading direction from front to back, which is shown by the fact that the heading term in the subgroups is one entire sentence that builds upon the previous subgroup heading term, also a sentence. It is always expanded and differentiated by the list of entries beneath it. This will be discussed in the following section.

Organisation of the Textbook De Anima

In contrast to his encyclopaedia, but not to the abovementioned *Pandecta*, Gessner does not use alphabetically arranged chapters in his textbook *De Anima*, but structures them according to the objects under discussion, moving from the general to the specific. After an initial general section, he explains the five external senses—sight, hearing, smell, taste and touch—but in inverse order. Unlike Aristotle, Gessner reorganises the succession of the senses. He starts with the sense of touch and then addresses taste, smell and hearing before discussing sight. His reason for this new order is extensively elaborated and has to do with the textbook's repetitious character:

> Aristoteles de visu primum agit, deinde auditu, olfactu, gustatu, et tactu postremo: quod circa tangendi sensum plures difficultates occurant, quam circa visum. a notioribus enim incipiendum semper existimat, si discendi docendive methodum sequi velimus. Sed quoniam nos non tam inquirimus nova: quam ab Aristotele fere et alijs inventa, repetimus, digerimus, exercemus, nihil prohibet quo minus contrario ordine, a primo et maxime necessario sensuum tactu, facto initio, per caeteros medios ad visum usque progrediamur.[44]

[44] Gessner, *De Anima* (1563), 798.

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He states that 'Aristotle deals first with the sense of sight, then with hearing, smell, taste and later with touch', because, roughly summarised, it is easier to deal with the sense of sight than with the sense of touch. 'But', he goes on, 'since we are not so much concerned about the new, but rather wish to repeat, digest and practice what we have found in Aristotle's work and those of others, nothing forbids that we may proceed in an opposite order, starting from the first and the most necessary of the senses, touch, alongside the other intermediates to the sense of sight.' Gessner deviated explicitly from a didactic path that put the difficult sense of touch at the end and, for additional didactic reasons, he chose the opposite order for the chapters in his writing: he strives to review material with his students, to digest and practice it, meaning he does not break new ground in the discussion of the subject. He therefore starts with what is necessary.

The lists with which Gessner works in different places have different aspects in *De Anima*. Whereas the first, general section ending on page 797 consists almost without exception of numbered lists—aphorisms and superordinate sentences—the lists in the second part resemble patterns of encyclopaedias. The chapters on the single senses in the second part are structured similarly, but differ from the first part: Gessner created subgroups with the same name that explain the function of all the senses in greater detail. They serve to organise the entries and facilitate comparison: even in the entries Gessner compares organs and functions. In concrete terms, these categories include, first, a description of the organ (*organum*),[45] then of the medium (*medium*) or carrier of the sensory perception[46] and, finally, of the object (*objectum*) that is comprised by the sense. He includes the distinguishing qualities attributable to the sense (*modus*)—that is, the contribution it makes to enabling us to perceive the world. In the case of the tactile sense, for example, this contribution consists of allowing us to distinguish between the simplest elements of the touched object, such as warmth, coldness, humidity and aridity.[47] In the case of hearing, first the ear is discussed, then the air as medium and lastly, the sound as its object. In this case the *modus* is an assembly of

[45] Ibid., 798–799 (De Tactu); 831–833 (De Gustatu); 840–842 (De Odoratu); 880–884 (De Auditu); 930–933 (De Visu).

[46] Ibid., 799–803 (De Tactu); 833–834 (De Gustatu); 842–843 (De Odoratu); 884–889 (De Auditu); 928–930 (De Visu).

[47] Ibid., 803–831, quoted here p. 806 (De Tactu); 834–840 (De Gustatu); 843–880 (De Odoratu); 889–926 (De Auditu); 933–950 (De Visu).

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different characteristics of sound in tables. A look at the description of the organ shows the type of reasoning:

> DE AUDITV.
>
> Auditus est uis in meatibus auditorijs per medium / aeris (uel aquae) sonos percipiens. / [in the margins: Organum] De instrumento auditorio non conueniunt inter se au / thores. Aliqui simplicius aurem id esse dicunt: quod no / men modo auriculam significat, partem scilicet prominen- / tem, quae non tam ad audiendum, quam melius audien / dum data est quadrupedibus tantum, nec omnibus, sed / uiuiparis, et obiter etiam ad ornatum, praecipue homi- / ni. modo meatum interiorem qui in sanguine praeditis et / perfectioribus omnibus manifestus est. Sed quaerendum / est quaenam simplex particula aurium aut meatuum, / praecipuam ad audiendum uim habeat, ut in oculis pu- / [881] pilla.[48]

Gessner states briefly and without mentioning names that there were different opinions about the hearing organs. He first discusses if the hearing organ is the same as the ear, which only some hearing creatures have. He searches for something similarly differentiated as the pupil for sight. In doing so, he makes the implicit assumption that the external senses can be seen analogously. In this paragraph, he does not name any reference authors. He does so only rarely, as in the explanations that follow this paragraph and are not cited here. Nevertheless, it can be argued that Gessner does not follow the reasoning of Aristotle, but that of Galen or the physician Andrea Vesalius, whose work is based on anatomical models.[49]

Even though Aristotle does not dominate the argument, his influence can be seen in the choice of subchapters and *loci* and the framework of the argumentation. A table makes this clear. Gessner places it at the beginning, before he treats the individual senses. This table is the abridged version of the introduction to Aristotle's *De Anima* by Jacob Faber Stapulensis. The Paris humanist, theologian and author of the first complete Bible translation into French (1523–1530) Jacques Lefèvre d'Étaples, or Latinised, Jacob Faber Stapulensis, published the table in Paris in 1492 as part of his commentary on Aristotle's physics and it was used at university.[50] Similar,

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[48] Ibid., p. 880.

[49] See my 'Patterns of Thought in 16th Century Public Education', *Philosophy of Education: Research Areas, Paradigms, Methods, Critique & Humanism Journal* 26 (special issue, 2008): 141–158, for further details on where the thoughts actually derived from. On the whole, Gessner prefers an argumentation very close to the anatomical situation. He follows Galen's thought for the reason that Galen is closer to the physical than Aristotle.

[50] Jacques Lefèvre d'Étaples, *Paraphrases in physicos libros Aristotelis: Dialogus in physicam introductorius*, ed. Jodocus Clichtoveus (Paris: Johannes Higman, 1492). Later editions include the one printed for the university of Leipzig in 1505 (Leipzig, 1505).

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though not identical, categories are constructed and explained precisely in the following order:[51] '1. Potentia [potential], 2. Obiectum [object], 3. Operatio [mode of operation], 4. Organum [organ], 5. Gradus vivendi [stage of life].' Gessner deviates from this usual path by putting the anatomical discussion of the organ at the beginning of his line of reasoning and examining the topic of hearing from a different perspective, the evidence of the human and animal skeletons. The appearance of the dissected body has clear priority over the classical authors and creates the basis of argumentation. It can be linked to the verbal illustrations that stem from Aristotle and other classical authors such as Virgil. To cite only one of these examples, Aurelius Augustinus records having known someone who was able to move his ears back and forth.[52] Gessner took these quotes from collected volumes and encyclopaedias published in the Middle Ages and his own time, including the work of a contemporary, Caelius Rhodiginus,[53] who cited Virgil on hearing. He also used the tenth-century dictionary entitled *Suidas*, which contains thirty thousand terms and presents Greek next to Latin names.[54]

Gessner's use of encyclopaedias changes gradually and begins to focus on single authors of the early Greek Aristotle commentary tradition in his second argument, in which he discusses the medium. Whereas the qualities of air and water as instruments of transfer between object and ear are taken from Rhodiginus' work and *Suidas*, he goes into detail citing the commentary by Themistius in order to describe an anatomical peculiarity of the ear that segments the medium into an outer and an inner bearer of sound. The inner medium is closed off from the outer medium and is native to the human or animal that hears.

After Gessner deals with the organ of the ear and the mode of perception, he distinguishes sounds using pairs of opposites: *molle, durum* (soft, hard), *laeue, asperum* (gentle, harsh), *tenue, crassum* (weak, strong), and *argutum et ei oppositum sathron* (sharp and its opposite *sathron*). These contrasts are explained with great precision and are followed by a list of onomatopoetic expressions in the Greek language, arranged alphabetically. In several places he compares the expressions with Latin or German terms such as *schmatzen* (to eat with an open mouth)[55] and *saufen* (to

[51] Gessner, *De Anima* (1563), 747.
[52] Ibid., 884.
[53] Ibid., 883.
[54] Ibid., 884. For information on *Suidas* see: Encyclopaedia Britannica (1911): www.nationmaster.com/encyclopedia/Suidas (accessed 30 May 2013).
[55] Gessner, *De Anima* (1563), 920.

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drink like an animal).[56] At the end Gessner focuses on one sound appropriate only to human beings. This is the 'sermon', which in this context refers to a spoken statement. Gessner briefly touches upon the onomatopoeic expressions that result from the sermon, such as interjections.[57] Many of Gessner's statements are commonsensical, and the more difficult statements are supported by the writings of classical authors—for example, the assertion that the voice of the dolphin is very similar to the voice of men, as Plinius wrote.

If we examine the tradition of *De Anima* treatises, we can see that Gessner's work is structured in a different way. The tenth chapter of Gregor Reisch's *Margarita philosophica*, a school compendium of the complete knowledge of the *artes liberales* up to Aristotle's *physica*, dates from 1503[58] and treats the vegetative and sensory abilities of the soul. In the fifteenth subchapter, Reisch devotes a few sentences to the ear.[59] As a teaching device for Latin school and also for university, Reisch's work was reprinted in Basel with an update in geometry as late as 1535 and 1583.[60] His text is arranged differently from Gessner's and, for teaching purposes, takes the form of a dialogue between a fictive *magister*, or teacher, and his *discipulus*, or student. The student poses a question, and the teacher answers it. Two authors serve as references for the ear, the philosopher (Aristotle) and in one place Boetius in his treatise about music. Gessner keeps the Aristotelian structure, which separates the superordinate concepts of object (the sound), organ (the ear) and medium (air or water). However, he copies this structure directly from a source that is much closer to Aristotle—that is, the scholia commentary of Jacques Lefèvre d'Étaples, published at about the same time as Reisch's work, but in

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[56] Ibid., 921.

[57] Ibid., 924.

[58] Gregor Reisch, *Margarita Philosophica* (Freiburg im Breisgau: Schott, 1503). Used here: Gregor Reisch, *Aepitoma Omnis Phylosophiae. Alias margarita Phylosophica Tractans de omni genere scibile. Cum additionibus: quae in alijs non habentur* (Strasbourg: Grüninger, 1504).

[59] Reisch, *Margarita* (1503), ff. 225r–v; Reisch, *Margarita* (1504), ff. 244v–246r.

[60] Gregor Reisch, *Margarita Philosophica, Rationalis, Moralis Philosophiae Principia, Duodecim Libris Dialogice Cõplectens, Olim Ab Ipso Autore Recognita: Nuper Aũt Ab Orontio Fineo Delphinate Castigata et Aucta, Unà Cum Appendicibus Itidem Emẽdatis, et Quã Plurimis Additionibus et Figuris, Ab eodem Insignitis* (Basel: Henricpetri, 1535). Gregor Reisch, *Margarita Philosophica, Hoc Est, Habitvvm Sev Disciplinarvm Omnivm, Qvotqvot Philosophiae Syncerioris Ambitu Continentur, Perfectißima Kyklo-Paideia. a` F. Gregorio Reisch, Dialogismis Primùm Tradita: Dein Ab Orontio Finaeo Delphinate, Regio Parisiensi Mathematico, Necessarijs Aliquot Auctarijs Locupletata. Nunc Verò Innumeris in Locis Restituta* (Basel: Henricpetri, 1583).

a different geographical and scholarly context: Whereas Reisch's text was intended to be used in the Latin schools and universities around Freiburg im Breisgau, and had a clear mathematical focus, Lefèvre d'Étaples was a Paris professor of theology with a background in Greek and philosophy. There are a number of differences between Reisch's and Gessner's treatments of *De Anima*'s sequence on hearing. Reisch places hearing second in his discussion of external senses since he declares both hearing as well as seeing, the first-ranking sense, as the most necessary for learning. Gessner starts with the tactile sense. He also differs from Reisch in his description of the organ. Though both agree that the ability to hear is connected to an inner organ, not to the earlobe, Gessner gives a much more precise formulation of its physiology and its manner of working, spiced with the insight, knowledge and curiosity of a professional physician. He explains his views using many examples, for instance, that the ear cannot be the organ of hearing because some animals do not have ears. His insight into the anatomy of the ear leads him to agree with Themistius in distinguishing the outer and inner medium, and to conclude that the latter was used as the organ of hearing. Finally, Gessner's third major focus, the idea of a sermon and comparisons between sound and speech, which both involve lists of antonyms, is not present in Reisch's work.

A reference to Boethius, which Reisch includes in his work and which Gessner omits, places an emphasis on the outer medium of sound transfer in the work of Reisch: with Boethius' interpretation of Aristotle,[61] Reisch compares the movement of sound to the concentric waves sent out when a stone is dropped in water. Gessner is not as precise as Reisch. Gessner's generic view of sound as being similar to a wave—'undam ex lapilli proiectu' ('wave from a thrown stone')[62] stems from a compilation by Caelius Rhodiginus and lacks the idea of frequency. The model of sound waves as concentric water waves conforms to the modern interpretation of sound waves to which mathematicians like the Frenchman Marin Mersenne and the Swiss Leonhard Euler contributed in the seventeenth and eighteenth centuries and that can be calculated via trigonometric functions. But the connection of geometry, to which trigonometric functions belong, and nature had not yet been made in the specific case of Gessner and others in the sixteenth century. A major

[61] Boethius, *De Musica* 1, 14 (edition used: Anicius Manlius Severinus Boethius, *Boetii... Opera Omnia* [Paris: Garnier Fratres, 1882], col. 1179). See Reisch, *Margarita* (1503), ff. 225r–v; Reisch *Margarita* (1504), f. 245r.

[62] Gessner, *De Anima* (1563), p. 885.

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breakthrough for the geometrical application of the Boethian model (and also for the proof of comparability of both media, air and water) seemed to have come only with Galileo Galilei, who demonstrated in his *Discorsi* (1638)[63] that sound waves from a viola were visible if a glass of water was placed on top of the vibrating chord.

It appears that Gessner's *De Anima* is not a dialogue for teaching purposes, but is divided into superordinate concepts and statements with subordinate lists of topics. The second part of Gessner's *De Anima* does not provide direct lists of author references, but includes references to different authors concerning short arguments (Faber Stapulensis) or single sentences (Augustinus). Its structure characterises the book as a collection of *loci*, but is not consistently dedicated to one sort of *locus* like *Pandecta*. Gessner's text does not refer to Petrus Ramus's method, even though both use *loci*. Even with its lists and categories, the book displays a coherent argumentation. It is also evident that the text would be comprehensible without a parallel reading of one of the original classical texts, although it cites other works by name. However, as far as Aristotle goes, this work can be read in much the same way as the contemporaneous work by Melanchthon, as separate from the original and with an important focus on questions that lead the reader through the text, in the case of hearing, for example, the idea of the inner medium. The text is therefore not a work of scholia in the sense that it explains the terms of the Aristotelian text with the direct aid of lemmata quotes. By labelling his work a *repetitorium*, Gessner avoids a discussion of teaching method, without diminishing the value of the book for instruction.

5. *A Comparison of Gessner's Encyclopaedia, Textbook and Notes: Which Information Overlaps and Which Has Been Added or Discarded?*

We know of two books by Konrad Gessner that report on the hearing. The first is *Pandecta*. *Pandecta* is a compilation published in 1548 as the second volume of the *Bibliotheca universalis*. The book contains collections of citations by discipline under specific headings. The generic names are listed alphabetically, but the main topics consisting of generic names are not. For example, we first find the full description of all parts of the soul,

[63] Galileo Galilei, *Discorsi e dimostrationi matematiche intorno a due nuove science* (Leiden: Elsevir, 1638), 142. See also Dieter Ullmann, *Chladni und die Entwicklung der Akustik von 1750–1860*, Science Networks 19 (Basel, Boston and Berlin, 1996), 1–2.

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followed by the thematic breakdown, focusing on the generality of the senses via the single senses—from the sense of sight, hearing, smell and taste to the sense of touch. The quotes that are associated with the sense of hearing stem, above all, from other encyclopaedias and from Latin history. Gessner cites the following names as authors who write about the specific features of the sense of hearing: Plutarch, Brusonius, Pliny, Caelius Rhodiginus, Aelian, Lucretius, Ovid and Erasmus.

The second work in which hearing is discussed is Gessner's textbook *De Anima*, published about fifteen years later. The structure of the section that discusses the ear in the field of the external senses is similar to the one in *Pandecta*, but the subthemes are much larger and more developed. *De Anima* contains many more of the authors' names. I have listed them with page numbers in the appendix of this paper. The list shows that Gessner mentioned many ancient and modern names only once or twice, as in the case of Scaliger or Avicenna. The names that he mentions most, apart from Aristotle, are Aristophanes, Caelius Rhodiginus, Euripides, Eustathius, Homer, Pollux, Suidas, Themistius, Virgil. The names reveal that Gessner makes two significant omissions: he does not mention two contemporary trends, one associated with Petrus Ramus, the other representing the revival of the older tradition of Boethius, for example, in the work of Gregor Reisch. Gessner was familiar with both traditions: he cites Boethius' name and work *De Musica* in *Pandecta* for other topics, where he treats mathematics. He mentions Ramus only indirectly: in an unpublished study guide for students of medicine and philosophy from about 1560, he also writes that he favours and recommends the writings on physics by Jacobus Schegkius, who published a critique of Ramus, initiating a well-known epistolatory duel between the two scholars.[64] Schegkius is also cited in Gessner's *De Anima* interpretation. Not present in *Pandecta*, but introduced in *De Anima* is the reception of the Greek commentary tradition, which is represented by the late classical commentator Themistius.

To find out more about dependencies within the works of Gessner, another text needs to be taken into account, the *Liber Physicarum Meditationum*. This writing is not a book, but a compilation of notes, into which an edition of *De Anima* is integrated. The edition of Gessner's notes was compiled by his former student Caspar Wolff and is dated 1586,[65] twenty-one

[64] Zurich Central Library (Zentralbibliothek Zurich), MS C 50a No. 9 (= ff. 104r–108v).

[65] Konrad Gessner, *Physicarum Meditationum, Annotationum et Scholiorum Lib. V. Nunc recens ex variis Gesnerianae diligentiae relictis schedis et libris, studiose collecti, methodice*

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years after his death. Wolff attests their authenticity in the preface, but we do not know whether he inserted some of his own ideas or if he published the papers in their original order. Nor do we know if Wolff used the notes in his own class, since, together with Georg Keller, he was the successor to Gessner as professor of *physica*. The *Liber Physicarum Meditationum* includes not just one but two different approaches to Aristotle's *physica*. One of these approaches, the last one in the text, is closest to Aristotle and can be read as a kind of lemmata commentary, with word explanations; the other is much less concerned with Aristotle's text and stands by itself. The latter bears the closest resemblance to the textbook *De Anima* that Gessner published in 1563, but it does not explain only the soul. It goes through the entire gamut of Aristotelian physics. A comparison of the textbook and the first part of the *Liber Physicarum Meditationum* shows, for example, that Gessner's discussion of smell is much more elaborate in the 1563 textbook than it is in the notes.[66] However, both have the same structure, a sign that the notes and the textbook are not far from each other: the notes may have been elaborated into the textbook. The second part of the notes contains the date 1561. This part might have been jotted down together with preparations for the publication of the textbook *De Anima*, although the structure is very different.

The first part contains a very schematic, partially diagrammatic overview of the works of Aristotle. There are a few quotes and the author's names are those mentioned in *Pandecta*. Apart from Aristotle, who is quoted on almost every page, in the case of hearing, especially the Latin literary tradition and the Greek Homer are quoted. The description is very short. The form is similar in many places to a bracketed table. The second part of the *Liber Physicarum Meditationum* is more revealing. It is a very detailed commentary in the form of scholia: a word or phrase of the text is cited in Greek, followed by a detailed explanation of the meaning of this word or phrase. The section on *De Anima* cites three main authors, Simplicius (twice), Themistius (seventeen times) and Philoponus (twelve times). All of them are Greek philosophers who wrote commentaries on Aristotle's treatise on the soul in the first half of the first millennium AD. The main commentary, Themistius' work, is cited only in Greek. Several other authors are also mentioned: Aphrodisias and Hermolao Barbaro

dispositi et conscripti, per Casparvm Wolphivm Tigurinum Medicum, ed. Caspar Wolff (Zurich: Froschauer, 1586).

[66] See my 'Patterns of Thought in 16th Century Public Education' (2008).

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twice, and Suidas, Pythagoras, Schegkius and Plutarch only once. This means that the authors who play the leading role in *Pandecta* are also used here, but the main commentary is derived phrase by phrase from the work of others, namely, those in the Greek commentary tradition.

To judge by the authors he used, we might infer that a comparison of Gessner's notes on 'De Auditu' in the *Liber Meditationum Physicarum* with both *Pandecta* and his textbook would reveal that the first part of the *Liber Meditationum Physicarum* and *Pandecta* depend on the same kind of knowledge and cite the same authors, whereas the second part of the *Liber Meditationum Physicarum* is of a more independent nature, since *Pandecta* does not mention the Greek commentaries of Themistius, Philoponus or Simplicius. The textbook *De Anima* quotes all of the above, though it does not cite Philoponus or Simplicius on hearing. The textbook reduces the knowledge from the Greek commentary tradition to details stemming from Themistius and focusing on the inner medium of the ear. This detail shows that Gessner did not include all of his knowledge into the textbook. He chose the passages that he judged to be more revealing of anatomical-functional details.

6. *Conclusion*

The subject of this article is the way knowledge is dealt with. A *physica* textbook, the treatise of *De Anima*, written in 1563 by the Zurich physician, polymath, encyclopaedia author and physics professor Konrad Gessner, was chosen as an example from the works used in Zurich higher education. The character of this textbook with its lists can best be described as one of the great variety of collections of *loci communes*. These were compiled between ca. 1450 and 1800 by private individuals and also served as methodological aids in all realms of knowledge. Since Gessner worked with the concept of *loci communes* in his encyclopaedic work *Pandecta*, it makes sense to explain Gessner's view of their meaning with the help of this work. He uses the concept in *Pandecta* to identify subject fields. Here Gessner refers to concrete bibliographical references when he lists his literature on the specific topics. The reader is therefore given very precise information about the pages on which he can find the original quote with more information on the chosen topics. Gessner's *De Anima* is a treatise written to be read from the first page to the last. However, it contains so many small structural elements, such as lists and categories with subconcepts and substatements, that we can see his text as a *loci* collection,

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even though Gessner clearly did not bother to create a uniform system of *loci*. Nowhere did he adapt the work to the contemporary reception of Ramus's schemes. Gessner explains how this printed *loci* collection was integrated into teaching aims, since he explicitly identified his work as a *repetitorium*. In doing so, he assumes that the students received their knowledge of the objects and modes of argumentation treated in his work from a different source. This implies the possibility that the students read other books about the topic in or outside class, including Aristotle's text, in addition to this *repetitorium*. The reading of the original author is thus possible, but not necessary, to receive an introduction to the subject of the Aristotelian *De Anima*.

What did Gessner omit? The three writings and their interdependencies show that Gessner broadened the knowledge base and expanded his comments between 1548 and 1563. He added more new elements than he discarded old ones. However, the comparison of the textbook with the second part of the *Liber Physicarum Meditationum* shows that he greatly reduced his scholia commentary. Details in the works of Themistius, Philoponus and Simplicius are not discussed that he mentioned in the *Liber Physicarum Meditationum*. It is also clear that Gessner waived one important tradition of Aristotle interpretation, that of Ramus, and reduced another, that of Boethius. The findings suggest that he places a certain emphasis on a particular direction of interpretation that works closely with the original text of Aristotle and, like Faber Stapulensis or Themistius, stems from a scholarly Greek background. He combines this close textual explanation with a free discussion of anatomical evidence, questions the idea of sense reception and, in the case of hearing, the particularities of the medium of air functioning not only as a bearer of sound, but through separation of an inner and an outer sphere as a part of the hearing organ itself.[67]

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[67] His third important issue is not discussed here: the act of distinguishing sounds, to which he adds linguistic and cultural backdrops. Gessner used this method of distinguishing objects according to their qualities, emphasising their names (in different languages) widely in his encyclopaedia about the natural world. There he connects writing with pictures. The value of his iconic pictures has been recently discussed by Angela Fischel, 'Collections, Images and Form in Sixteenth-Century Natural History: The Case of Conrad Gessner', *Intellectual History Review* 20 (2010): 147–164, and Angela Fischel, *Natur im Bild: Zeichnung und Naturerkenntnis bei Conrad Gessner und Ulisse Aldrovandi*, Humboldt-Schriften zur Kunst- und Bildgeschichte 9 (Berlin: Mann, 2009).

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Is Gessner's construction of a textbook a personal peculiarity, explicable by personal preferences, or does it take into consideration the textbook tradition of his time? Compared to the three authors he connects in his book, Vives, Amerbach and Melanchthon, the following is revealing: Vives drops the names of six authors in a very condensed space of one sentence per author. They are Rodolphus Agricola, Quintilian, Galen, Hesiod, Themistocles and Thucydides (pp. 93–95). Vitus Amerbach cites only Themistius and Virgil, referring to the echo and also only using one sentence per author (340–345). Finally, Melanchthon mentions Nicander, Plinius, Virgil and Dioscoridis (625–626). This result makes clear that none of them used the technique of collecting quotes to the same extent as Gessner. His text bears a greater resemblance to other sorts of literature, as would a long entry in an encyclopaedia that 'unpacks' the quotes.

At the beginning of this analysis we alluded to the fact that Gessner mixed the encyclopaedic structure with other generic sections in which he used a quote-compiling aphoristic style. The latter was not part of this analysis. It is a happy coincidence that the Greek physician Hippocrates wrote *Aphorisms* on medicine in a similar style in the fourth/fifth century BC. They were published with commentary throughout the sixteenth century in Europe as textbooks for medicine, once even with a contribution by Gessner himself.[68] Whether or not Gessner meant to interconnect the aphoristic structures he used in *De Anima* with the medical world of Hippocrates—as, for example, his favourite sixteenth-century commentator Jacobus Schegkius did on the level of content[69]—remains informed speculation and warrants a separate in-depth examination.

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[68] Hippocrates, *Aphorismorum Hippocratis Methodus nova, ab Achille P. Gassaro Lindaviensi Medico primum quinque libris distincta: deinde vero Conradi Gesneri Tigurini Medici opera illustrata. Huic Accedunt praeterea libelli de re medica aliquot prius non editi... omnia nunc primum opera et studio Caspari Wolphii Tigurini Medici in lucem data. (Veterum ac recentiorum ferme omnium Scriptorum in Hippocratis opera extantium Catalogus, Caspari Wolphij... studio collectus... Conradi Gesneri... Perioche tertij Libri Galeni de Temperamentis, hoc est, primis medicamentorum facultatibus... De Medicamentorum simplicium facultatibus cognoscendis, incerti authoris libellus.)* (St. Gallen: Straub, Leonhard, 1584).

[69] Jacobus Schegkius, *Iacobi Schegkii Schorndorffensis in octo Physicorum, Sive de Auditione Physica Libros Aristotelis, Commentaria longe doctissima nunc primem in lucem edita. Eiusdem Iacobi Schegkii Commentarius in Aristotelis de Anima libros tres, nunquam antea editus* (Basel, 1546), 331–333 (on hearing).

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7. *Appendix*

Gessner, *De Anima* (1563), authors mentioned for 'De auditu' (880–926), except Aristotle.

Name	page
Adrianus	883
Aeschylus	919
Albertus Magnus	895
Ammonius	898
Apollonius	913–914, 919
Archytas	889, 901, 919
Aristophanes	905, 914, 916, 919–922, 924
Augustinus	884
Avicenna	884–885
Budaeus	903
Caelius Rhodiginus	883, 885, 897–898, 902–903, 906
Catullus	909
Celsus	882
Chrysostomus	911
Diomedis	921
Dion in Pompeij	898
Dionysius	920, 922
Donatus	903
Euripides	913, 919, 921–922
Eustathius	912, 914–915, 918, 921–923
Flaccus	894
Gaza	906
Hesiod	913–916, 918
Hippocrates	916
Homer	902, 909, 914–915, 917–918, 920–921
Horatius	924
Iosephus	921
Iuvenalis	924
Livius	894
Nicander	921
Nicolaus Erythraeus	925
Ovid	908
Philonius	902

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(*cont.*)

Name	page
Plato	917
Plautus	903
Pliny	925
Plutarch	897–898, 920
Pollux	904–906, 913–914, 916, 922
Quintilianus	904
Rob. Constantinus	911, 926
Savonarola	887
Servius	894, 908–909
Sophocles	913, 918–919
Suidas	880, 882, 885, 887, 894, 902, 910, 917, 926
Terentius	890, 903, 922
Themistius	885–888, 894, 901
Theocritus	904, 919–920
Titinnius	909
Virgil	883, 894, 908–909, 919, 922, 923
Verrius	922
Vitruvius	896, 911

Gessner, *Pandecta* (1548), authors mentioned for 'De auditu' (213–214), except Aristotle

Aelianus	Io. Ferrerius	Ovid
Brusonius	Gellius	Pliny
Caelius Rhodiginus	Lucretius	Plutarch
Erasmus	Macrobius	Pollux

Gessner, *Physicarum Meditationum*, first part, authors mentioned for 'De auditu' (211–212), except Aristotle

Archytas	Theophrastus
Vitruv	Homer
Constantinus	Callimachus
Caelius Rhodiginus	Hesiod
Plato	

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Gessner, *Physicarum Meditationum*, second part, authors mentioned for 'De auditu' (103–107), except Aristotle

Themistius (17x)
Philoponus (12x)
Simplicius (2x)

Mentioned once: Gesnerus

Reisch, *Margarita Philosophica* (1504), authors mentioned for his section on 'auditus definitur...' (ff. 244v–246r)

Boethius

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