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Article:

Looking up music in two 'encyclopedias' printed in 1501

Tim Shephard and Charlotte Hancock

This essay works through a simple experiment. Imagine an educated Italian from a well-to-do professional family, perhaps the daughter or wife of a noted physician. She has dinner with a friend who is a proper music buff, and in the course of their conversation her friend bamboozles her with music terminology in an annoying effort to sound expert. The next evening, she retreats to the book-chest and writing desk in the corner of her bedroom to do a bit of jemming up. In her book-chest are two encyclopedic volumes, (pseudo-) Aristotle's *Problemata* and Niccolò Perotti's *Cornucopiae*, in 1501 printed editions including rigorous alphabetical indexes clearly intended to facilitate reference consultation. Opening the two books on her writing desk, she runs a finger through the index of one then the other, looking up a range of obvious musical terms and concepts. What musical knowledge will she arrive at by this process?

A more conventional musicological study of these two books would most likely adopt a more philological, history-of-ideas approach.[1] It might consider, for example, on which earlier sources on music theory Perotti is drawing in

[1] Such studies have already been published on the *Problemata*, all focussed on its commentary: F. Alberto Gallo, 'La Trattatistica Musicale', in *Storia Della Cultura Veneta. 2: Il Trecento* (Viccenza: Neri Pozza, 1976), 469–76, at 473; Claude V. Palisca, *Humanism in Italian Renaissance Musical Thought* (New Haven: Yale University Press, 1985), 51–66; Charles Burnett, 'Hearing and Music in Book XI of Pietro d'Abano's Expositio Problematum Aristotelis', in Nancy van Deusen (ed.), *Tradition and Ecstasy: The Agony of the Fourteenth Century* (Ottawa: Institute of Medieval Music, 1997), 153–90; Letterio Mauro, 'La Musica nei Commenti ai Problemi: Pietro d'Abano e Évrart de Conty', in *La musica nel pensiero medievale* (Ravenna: Longo, 2001), 31–69; Christian Meyer, 'Entre Musique et Philosophie de la Nature: Le Defi de la Section XIX des Problemata Physica Aristoteliciens', in Pieter de Leemans and Maarten J. F. M. Hoenen (eds.), *Between Text and Tradition: Pietro d'Abano and the Reception of Pseudo-Aristotle's Problemata Physica in the Middle Ages* (Leuven: Leuven University Press, 2016), 149–62; Pietro d'Abano, *Expositio Problematum (XIX)*, ed. Christian Meyer (Leuven: Leuven University Press, 2022). To our knowledge nothing has been published on the *Cornucopiae* from a musicological perspective.

his brief remarks – maybe Boethius? Or Johannes de Muris, whose music theory remained influential in fifteenth-century Italy? Or perhaps he knew the work of a contemporary musical expert such as Bartolomeo Ramos de Pareja or Niccolò Burzio? Or it might consider how the account of ancient Greek music theory in the *Problemata* underlines or contradicts the information we have from other important antique sources on the subject, such as the treatises of Ptolemy, Bryennius, and Aristides Quintilianus. Or it might collate the interventions of the work's medieval commentator, Pietro d'Abano, on music, and show how they amount to a coherent, exhaustive, and well-informed treatment of music theory as it was undertood in Parisian and north Italian academic circles in the early fourteenth century. Or it might study the transmission of the texts across several printed editions and manuscript copies, referring back to an original version closely associated with the author. To undertake such erudite enquiries, the musicologist might rely on an exhaustive knowledge of ancient, medieval, and Renaissance music theory literature, its genealogical relationships and patterns of transmission – or, perhaps more likely, a full-text search of the *Thesaurus musicarum latinarum* (https://chmtl.indiana.edu/tml/).

We have no intention of arguing that approaches such as these are illegitimate or without value. Indeed, inevitably, we make use of them within our Sounding the Bookshelf project – for example, in Ştefănescu's contribution to this volume, where they help to reconstruct a network of fifteenth-century Italian clergymen whose shared interest in the sensory experience of heaven was reflected in their preaching activities. Nonetheless, it seems clear that this type of reading is much more characteristic of the humanities scholar in 2023 than it is of the general-interest reader in 1501. The majority of readers in 1501, even those who had benefitted from an expensive education, were not closely familiar with the intellectual history of music theory, with Boethius' *De musica* or with ancient Greek harmonics. They had no exhaustive music-theoretical frame of reference within which to locate the disparate fragments of information found with the help of an index as components of a coherent total understanding, or through which to make sense of concepts only half explained or badly translated via concordances with other, better sources. They had little access to information concerning the author's library, professional network, and previous studies. On the whole they probably took what they read at face value and processed it in relation to their familiar musical experience, rather than painstakingly reconstructing a network of tacit borrowings to reveal a conceptual and textual genealogy stretching back decades or centuries. Therefore in this essay, which sets out to investigate the kinds of musical sense that a casual reader in 1501 might have made out of reference publications, we deliberately take a contrasting approach.

Heterogeneity, chronological disparity, and internal contradictions are inherent in the data produced by our 1501 corpus as a whole. The 1501 edition of Aristotle's *Problemata* that serves as one of the case studies in

this essay is a single example that can stand for the whole corpus in this respect. Among its pages are interventions from at least thirteen separate authors, editors, translators, and commentators (counting only those who are named within the book), spanning some two millennia, each with different scholarly objectives and different readerships in mind, as well as radically different musical backdrops against which to set their remarks on the subject. In such circumstances, it is entirely impossible to find a coherent thread of musical discourse; and a seamless integration of the musical knowledge found in the book into the musical practices and ideas immediately familiar to a reader in 1501 seems equally unlikely. Our reader must struggle bravely to accommodate or overlook the anachronisms and conceptual dissonances inherent in the musical material she finds. The same is true of all of our 1501 corpus, both as a whole and in many of its individual texts. This situation presents a significant challenge to disciplinary methods that seek to assemble cultural and intellectual materials selectively into a coherent and satisfying 'interpretation' because it is self-evident that the very coherence of any such interpretation would in itself be a misrepresentation of our findings. Reading for musical knowledge in 1501 was not an activity necessarily characterized by the sense of satisfaction arising from a story well told. Rather, for many Italian readers, perhaps for most of them, it seems inevitable that it was fraught with the frustration of contradictions, disjunctions, misunderstandings, and seemingly irrelevant information. The approach taken in this essay, and the hypothetical scenario that gives life to it, represent an attempt to respect and accurately reflect these difficulties, instead of flattening them out by means of an expert intertextual apparatus.

THE TWO 'ENCYCLOPEDIAS'

Several of the longer books in our 1501 corpus contain an index, a device that was usually created independently of the main text, often much later, and by a different author or authors.[2] These indexes are printed at the beginning or the end of the indexed text, and constitute an alternative structural framework through which to engage with the main text as a reference work, separate from the pattern of books and chapters designed by the author, the editor, or by scribal tradition. The authors of indexes are sometimes named, and the presence of such a device is sometimes mentioned or even trumpeted on the title page as a USP of the volume. Our 1501 corpus contains many texts

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[2] On the history of indexes from the late Middle Ages to the early modern period, see, among others, Ann Blair, *Too Much to Know: Managing Scholarly Information Before the Modern Age* (New Haven: Yale University Press, 2010), 132–44; and Judith Flanders, *A Place for Everything: The Curious History of Alphbetical Order* (Baisingstoke: Picador, 2020), 79–101 and 118–46.

which were already centuries old in 1501, whereas many of the indexes were relatively recent.

To us, this all makes indexes very interesting. Someone in the late fourteenth or fifteenth century has thought long and hard about what specific information an assumed contemporary reader will wish to retrieve from a text, and the kinds of questions they will want to ask it. Then, by choosing specific passages and paragraphs to draw the reader's attention to, in effect they have curated a new compilation, hewn from the rock of the main text, but cut down and reshaped to serve particular ends. Ann Blair has shown that, although the index was not a new concept in the Renaissance, from the late fifteenth century on rigorously alphabetised indexes became particularly integral to the expanding category of printed reference works, serving to facilitate consultation use as a distinctive manner of reading.[3] Among the many books falling within the broad category of 'scholarship' in our 1501 corpus, Perotti's *Cornucopiae* (Venice: Giovanni Tacuino) and Aristotle's *Problemata* (Venice: Boneto Locatelli) have particularly monstrous indexes, and went through several editions in the early sixteenth century, suggesting that they saw some success as reference works. A note to the reader prefacing our edition of the *Cornucopiae* explains that its index is newly improved 'to make it easier for you to find the word you are looking for' (ut facilius quod quaesiveris verbum in tabula tibi occurrat), suggesting that consultation use is precisely the kind of reading the printer had in mind. Most likely the method used by our hypothetical reader in approaching these publications, learned from her childhood grammar tutor, will be to exerpt or paraphrase the relevant passages discovered with the help of the indexes in her private notes, under a topical heading (perhaps 'Musica') for ease of later location, and then memorise the excerpts so that the information will come readily to her tongue in future conversations.[4] In what follows we will introduce the two books and their indexes, before proceeding on to the experiment proper.

Following an enviable education embracing the schools of Vittorino da Feltre and Guarino, and the University of Padua, Niccolò Perotti began his career teaching rhetoric and poetry at the University of Bologna, before entering the priesthood and rising rapidly to the rank of archbishop.[5] As a scholar of classical literature his principal contributions were commentaries, particularly on Martial and Pliny, and he was well known for his bestselling grammar textbook *Rudimenta grammatices*, which went through dozens of printed editions from the late fifteenth to the late sixteenth century. Completed around 1480 as a retirement project, the *Cornucopiae* started life

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[3] On reference publications from the late fifteenth century on and their relationship to indexes and other finding tools, see Ann Blair, *Too Much to Know*, 117–72.

[4] On the practice of note-taking in relation to reference consultation of indexed books in the sixteenth and seventeenth centuries, see Ann Blair, 'Reading Strategies for Coping With Information Overload ca.1550–1700', *Journal of the History of Ideas* 64.1 (2003), 11–28, esp. 17–9.

[5] Perotti's biography is summarised in Paolo D'Alessandro, 'PEROTTI, Niccolò', *Dizionario Biografico degli Italiani*, Vol. 82, 2015: <https://www.treccani.it/enciclopedia/niccolo-perotti_(Dizionario-Biografico)>.

as a commentary on Martial's epigrams, but because Perotti set out to comment on every word in Martial's oeuvre it wound up as a kind of Latin dictionary-cum-encyclopedia.[6] The USTC lists 21 Italian printed editions between 1489 and 1527, a rate of more than one every two years, suggesting considerable success during these decades. At 750 pages (in our 1501 edition), the prospect of reading it cover to cover is quite daunting, so it is an obvious candidate for adaptation to reference use. Indeed, it gained an index with its first printed edition of 1489 (Venice: Paganinus de Paganinis), which was supervised by Ludovico Odasi, a tutor and secretary recruited to the court of Urbino by Federico da Montefeltro, Perotti's dedicatee.

Subsequent editors expanded the index and refined its reference apparatus; and none more so than Benedetto Brugnolo, the literature professor at the school attached to the ducal chancery in Venice, who is responsible for our 1501 edition. In fact, Brugnolo is so justifiably proud of his 48-folio, 480-column index that the verbose and self-congratulatory title page entirely omits to mention Perotti (Fig. 1). This edition also dispenses with the 'original' prefatory materials given in some previous editions, presenting only a short address to the reader from the printer, Tacuino, which is mostly devoted to explaining the virtues of Brugnolo and his newly improved index. The index itself, which follows immediately, represents the state of the art in alphabetised indexing in 1501 (Fig. 2). Perotti's text comments on individual Latin words, so clearly the indexer's main job is to make a list of the individual Latin words that are commented on, and put them in alphabetical order – not only by first letter, as in some indexes, but so far as possible also by all the other letters in each word, as Tacuino proudly announces. The reference system comprises a number referring to a column, and a letter referring to a specific location within that column. In theory this allows the reader to flick very directly to the relevant passage, but in practice the letters are positioned in the margin rather impressionistically. Therefore, the reader almost inevitably ends up scanning a longer passage than that indicated strictly by the letter, looking for a complete and coherent statement that is directly relevant to their index enquiry, but encountering a quantity of indirectly relevant information in the process.

As befits the literary character of the *Cornucopiae*, music's appearances in this index are filtered through a classical and classicising perspective. Musical characters from classical myth, such as Amphion, Orpheus, Pan and the Muses, are richly represented. Ancient musical instruments such as the *tibia* (pipe), *tuba* (trumpet), *cornu* (horn), and *cithara* are present principally as ancient musical
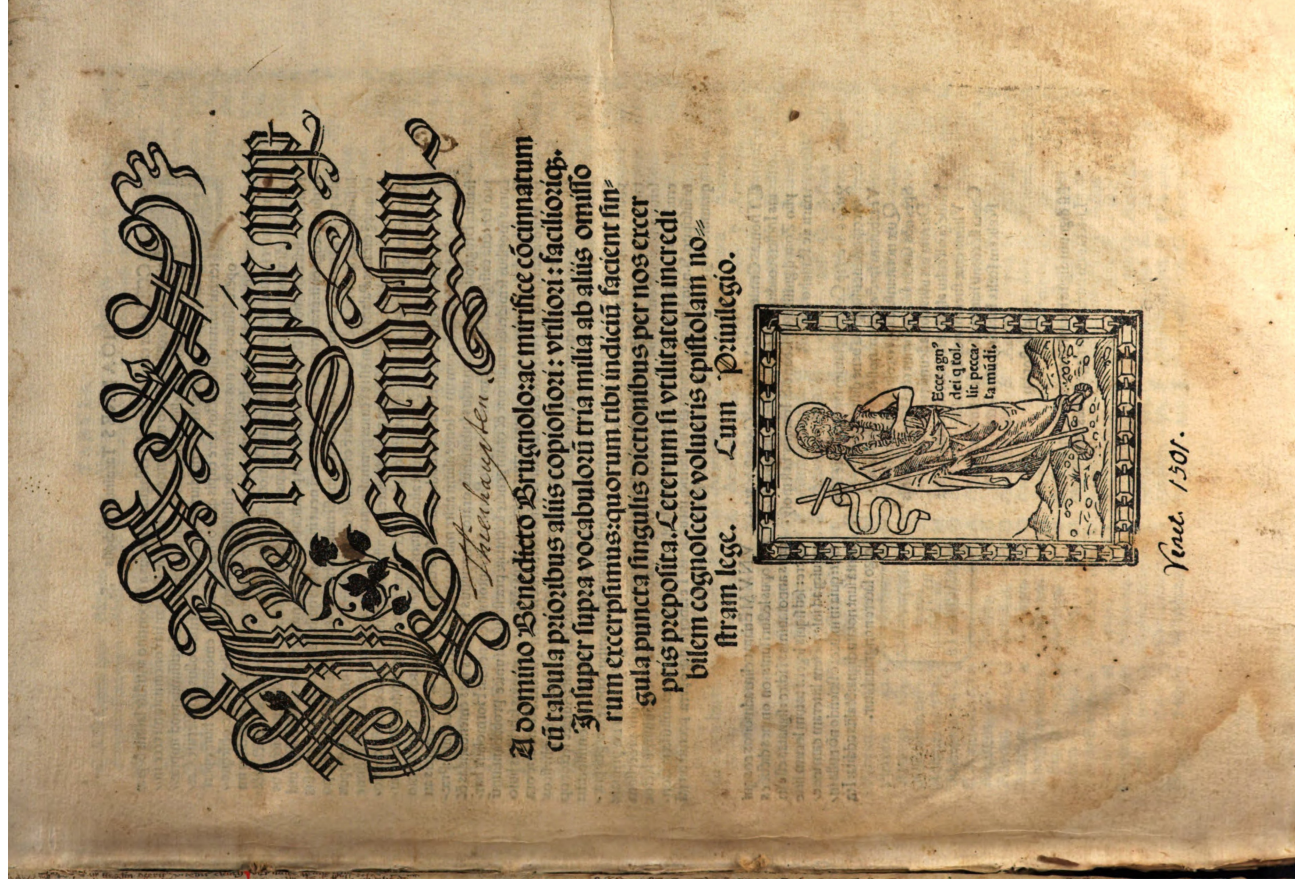

Fig. 1 Niccolo Perotti, *Cornucopiae* (Venice: Giovanni Tacuino, 1501), title page. Munich, Bayerische Staatsbibliothek, 2 L.Lat 120, urn:nbn:de:bvb:12-bsb10147592-8. Photo courtesy of the Bayerische Staatsbibliothek

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Fig. 2   Perotti, *Cornucopiae*, first page of index. Photo courtesy of the Bayerische Staatsbibliothek

instruments, rather than as classicising veils for modern equivalents such as the recorder and lute. There is a particular focus on the term *carmen* and its overlap with *cantus*, reflecting the classical ideal of the unity of poetry and music. But there are also numerous index entries of broader musical relevance, such as *musica* itself of course, and also *harmonia* and *concento, melodia,* and others.

Our other 1501 'encyclopedia' is different in almost every respect; a bewilderingly compound book, constructed out of numerous interacting authorial and editorial interventions. It is a compilation of *problemata* – scientific works written in a question-and-answer format – with a bare title page listing four texts ([Fig. 3](#)). First is the *Problemata* attributed to Aristotle, which is said to be given in the 'old' Latin translation, a thirteenth-century word-for-word rendering by Bartholomew of Messina, and the 'new', much looser fifteenth-century Latin translation by Theodore Gaza, and accompanied by a commentary completed in 1310 by Pietro d'Abano.[7] Later in the book we learn that the complicated task of collating the old and new translations with the commentary for this edition was completed by Domenico Massaria, a celebrity physician in the Veneto; and we also find a reprint of the dedicatory letter written for the 1475 Roman printed edition of Theodore Gaza's translation, addressed by the Venetian physician Niccolò Gupalatino to Pope Sixtus IV. Second in the list on the title page, with its own entry, is the alphabetical index to Aristotle's *Problemata* created by Pietro Curialti, professor of medicine at the universities of Bologna then Pavia from the 1370s to the early 1400s.

Third and fourth in the list are *Problemata* by Alexander of Aphrodisias and Plutarch, both of which are accompanied by their own paratexts. Alexander of Aphrodisias' *Problemata* are prefaced by two dedicatory letters. The first is written by Vittore Pisani, a contemporary Venetian known for a commentary on Cicero but otherwise obscure; he may be the editor of this segment of the book. The second is that of the translator of Alexander's *Problemata*, Giorgio Valla, the recently deceased chair of Latin and Greek at the University of Venice. Valla addresses himself to Giovanni Marliani, a Milanese nobleman who trained as a physician and taught medicine and mathematics in Milan; Valla salutes him as both mathematician and medical expert.[8] Plutarch's *Problemata* appear to have been edited by Giovanni Perlanza Ruffinoni, *detto* Calfurnio, a prolific editor for the printing press

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[7] Although the authorship of the *Problemata* is now debated, for the purposes of our experiment they are by Aristotle. On the translation history of the *Problemata* see Iolanda Ventura, 'Translating, Commenting, Retranslating: Some Considerations on the Latin Translations of the Pseudo-Aristotelian *Problemata* and their Readers', in Michèle Goyens, Pieter de Leemans, and An Smets (eds.), *Science Translated: Latin and Vernacular Translations of Scientific Treatises in Medieval Europe* (Leuven: Leuven University Press, 2008), 123–54. See also John Monfasani, 'The Pseudo-Aristotelian *Problemata* and Aristotle's *De Animalibus* in the Renaissance', in Anthony Grafton and Nancy Siraisi (eds.), *Natural Particulars: Nature and the Disciplines in the Renaissance* (Cambridge, MA: MIT Press, 1999), 205–50; and Pieter de Leemans and Michèle Goyens (ed.), *Aristotle's Problemata in Different Times and Tongues* (Leuven: Leuven University Press, 2006).

[8] Marliani's medical treatise *De caliditate corporum humanorum* features in our corpus (Venice: Boneto Locatello for the heirs of Ottaviano Scoto, 1501).

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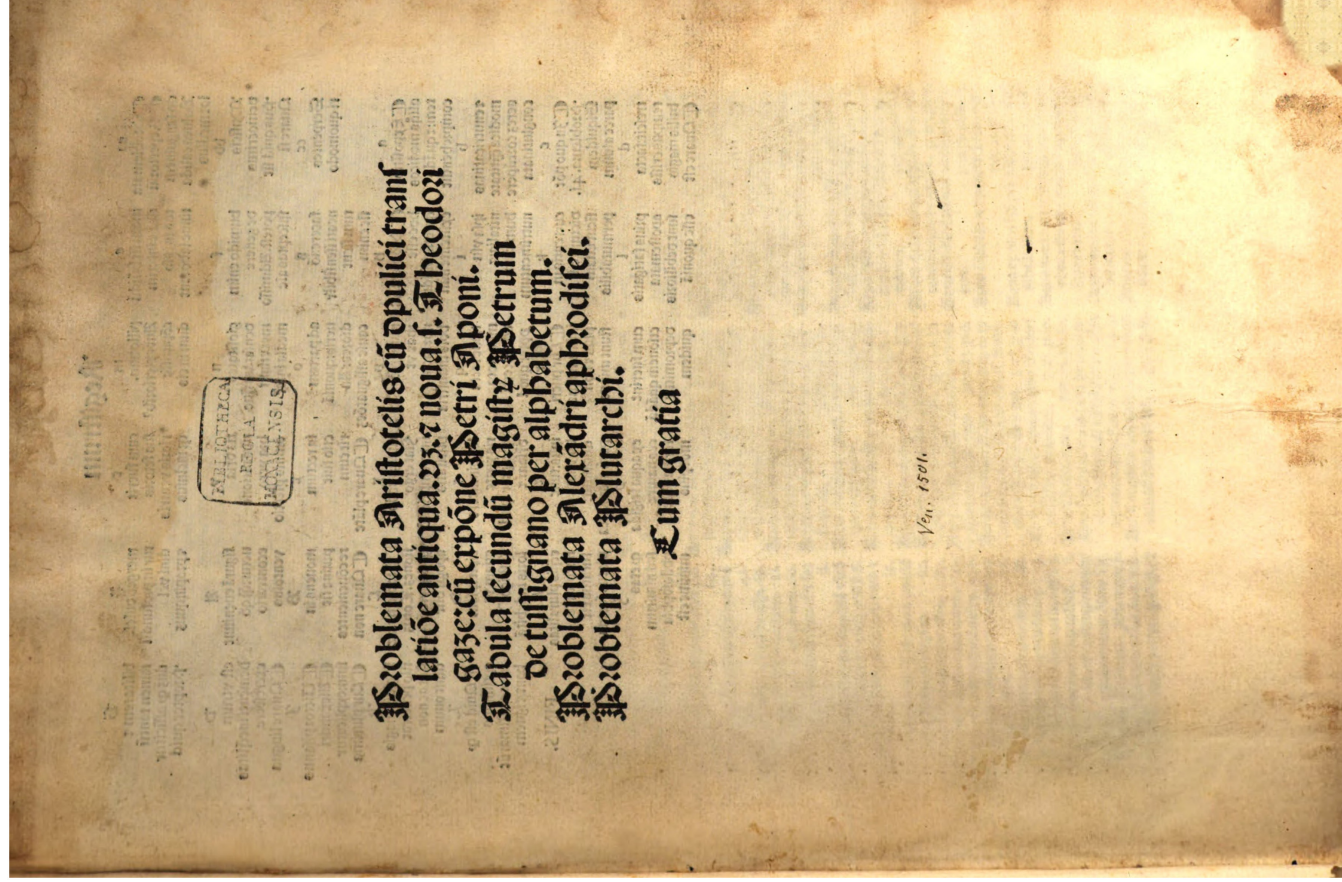Fig. 3 *Problemata Aristotelis…* (Venice: Boneto Locatelli, 1501), title page. Munich, Bayerische Staatsbibliothek, Res/2 A.gr.b. 319, urn:nbn:de:bvb:12-bsb10139236-0. Photo courtesy of the Bayerische Staatsbibliothek

during the later fifteenth century, active in Vicenza and Venice. His dedicatory letter names the translator as Giovan Pietro d'Avenza, a student of Vittorino and Guarino who preceded Brugnolo as instructor at the chancery school in Venice.

These *Problemata* by Alexander of Aphrodisias and Plutarch are really a kind of coda, however; Aristotle is the main event, taking up 600 out of the roughly 650 pages. Given the complex collation of texts associated with Aristotle's *Problemata* – Greek original, two Latin translations, commentary, index, and the accessory *Problemata* of Alexander and Plutarch – it is unsurprising to find that its publication history across this period is a little convoluted (see Table 1).[9] Gaza's translation, alone, was printed in Mantua c.1473, and then in a revised, final version in Rome in 1475. Also in 1475, Bartolomeo da Messina's translation reached print for the first time, in Mantua, in company with Pietro d'Abano's commentary and a different, much shorter index; a similar edition, lacking the index, followed in Venice in 1482. The Greek *Problemata* appeared in volume 4 of the Aldine Aristotle edition in 1497. 1501 was a key year, seeing two *Problemata* editions. One anthologises Gaza's translation alongside the *Problemata* of Alexander of Aphrodisias (which appears first) and Plutarch (last), both of which had by this point already featured in their own solo printed editions. The other 1501 edition is that used in this essay; it was reissued essentially unchanged by different Venetian printers in 1505, 1518 and 1519, and was thus apparently the most successful of the various *Problemata* compilations.

Despite the ordering on the title page of our 1501 edition, it is Curialti's index that appears first, running to an impressive 44 pages in three columns. This index is a very different beast from that in the *Cornucopiae*, and at around a century old presents methods of organisation that may have struck experienced readers in 1501 as clunky and old-fashioned. As its incipit clarifies, it is really an index of Pietro d'Abano's commentary, rather than of Aristotle's *Problemata* per se. Few of the entries point to the problems themselves, or even to Pietro's direct explication of the problems; rather, most entries point to the long passages in which Pietro expands in a more general way on the topics raised by the problems, drawing on a wide variety of classical sources. So, in this edition, at least for readers using the index, Aristotle's problems are really just coathangers for a commentary that has become an encyclopedia in itself.

The index begins with a table of contents listing the 38 books of the *Problemata*, naming their topics, and specifying how many problems are in each one (Fig. 4). Then we have a roughly alphabetical subject index, assembled mostly not from keywords but from short phrases identifying specific aspects of a topic, similar to the commonplaces distilled from a key text that

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[9] In addition to the literature cited above, see Jill Kraye, 'The printing history of Aristotle in the fifteenth century: a bibliographical approach to Renaissance philosophy', *Renaissance Studies*, 9.2 (1995), 189–211.

Table 1 Italian printed editions of Aristotle's *Problemata* in the period around 1500

Edition	'Old' trans	Commentary	Curialti index	Alt. index	'New' trans	Alex. of Aphro.	Plutarch
Mantua: Johannes Vurster and Johannes Baumeister, c.1473					X		
Rome: Johann Reinhard, 1475					X		
Mantua: Paulus Butzbach, 1475	X	X		X			
Venice: Johannes Herbort, 1482	X	X					
Venice: Albertino da Lessona, 1501					X	X	X
Venice: Boneto Locatello, 1501	X	X	X		X	X	X
Venice: Gregorio de Gregoriis, 1505	X	X	X		X	X	X
Venice: Lucantonio Giunta, 1518	X	X	X		X	X	X
Venice: haer. Ottaviano Scotto, 1519	X	X	X		X	X	X

one might find in a florilegium. For example, we have a long list of entries starting 'Aqua' covering different topics relevant to water (the first word of an entry is usually a useful keyword). The number attached to each entry sends the reader to a specific problem, which is not especially helpful given that the commentaries to some individual problems unfold over several pages. Therefore, quite a bit of work is required on the part of the reader to identify the specific passage the indexer had in mind.

When we reach the word 'Quare' (Why), the structure of the index changes temporarily: the word 'Quare' produces 10 pages of entries covering a large number of Aristotle's individual problems roughly in their order of appearance, with the start of each new book indicated by printing the word 'Quare' in larger text. For example, in the section covering Book 19, which is focussed on music, there are entries for problems 1, 4, 5, 6, 7, 9, 10, and so forth (Fig. 5). Unlike the rest of the index, this 'Quare' section points directly to Aristotle's

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Fig. 4   *Problemata Aristotelis…*, first page of index. Photo courtesy of the Bayerische Staatsbibliothek

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Fig. 5 *Problemata Aristotelis...*, "Quare" entries in the index, including those relating to Book 19. Photo courtesy of the Bayerische Staatsbibliothek

problems: the entries are essentially summaries of the content of each problem, in some cases almost amounting to a new abbreviated Latin translation of the problem – although in many cases the translation has the sense abbreviated out of it; for example, for Problem 19.24 we read 'Why with thin strings etc.' (Quare cum subtilibus chordis, etc.). In several cases it is clear from the summary index entry that Curialti's understanding of individual problems in Book 19 was incomplete, something that is not surprising given the extreme ambiguities of the text.

Pietro d'Abano, Pietro Curialti, Domenico Massaria, and Niccolò Gupalatino were all medical experts, something that gives us a clear indication as to which scholarly community was most invested in the reception of this text. Medical interests are certainly well served by the index. Aristotle's *Problemata* discuss music, sound and hearing extensively in several places: Book 11 covers the voice, Book 19 is on music itself, and Book 32 covers the ears. Nonetheless, music is given relatively little space in the index, crowded out by a veritable avalanche of entries on health and wellbeing topics, such as teeth, eyes, feet, pustules, herbs, drunkenness, sleep, diuretics, skin conditions, sex, sperm, the humours, fever, contagion, menstruation, vomit, urine, and much else besides. Ignoring the 'Quare' section, there are essentially three types of entry directly focussed on music. First there are a handful of entries concerned with setting out the scope and nature of music in general; these point the reader to Problem 19.1. Then, more numerous are the short entries identifying a key term from music theory, such as *simphonia*, or *dissonantia*; these point to Problems 19.7 and 19.16. Finally, there are longer entries summarising the origins and history of music, pointing to Problems 19.1 and 19.3.

ENTRIES CONCERNING THE HISTORY AND NATURE OF MUSIC

Now our reader will begin to look up some obvious musical terms and concepts in these indexes, and we will see what information they to point her to. First she will look for entries leading to general information concerning the scope, nature, and origins of music. This can be achieved very simply by looking up *musica*. In the *Cornucopiae* index we are given two references: column 161 item B, and column 781 item D. The first of these is certainly a mistake, however, because column 161 is entirely devoted to the differentiation of urban, suburban, and rustic, making no mention of music. Most likely column 616 (which is actually mis-labelled 116) is intended, but there is no way our reader can know that at this point in her investigation, so we must leave it for later in the essay, where it will be cued up by a different index term. The second reference, in column 781, says the following:

> Properly, however, those are called mathematicians who profess mathematics or the mathematical disciplines, which are Arithmetic, Geometry, Music, and Astrology. These are indeed properly called Mathematics, that is, disciplines, for

they are more certain than others. But as these [i.e. mathematicians] are also borne along into the excessive vanity of predicting the future, or even the unknown past, even the name of mathematicians has been condemned as damnable, and used for those who practice divination and fortune tellers, who announce the future through casting lots, also those who choose something by sortilege.

Proprie tamen mathematici dicuntur qui mathemata: sive Mathematicas disicpilinas profitentur: que sunt Arithmetica. Geometria. Musica. et Astrologia. hae enim proprie Mathemata: hoc est disciplinae dicuntur: quia certiores aliis sunt. Sed quoniam hi quoque in nimiam vanitatem provecti sunt predicendi futura: sive etiam preterita incognita. Mathematicorum quoque nomen tanquam damnabile explosum est: et pro iis usurpatum qui divinationem profitentur et Sortilegi: qui per sortes futura pronunciant. item qui aliquid eligunt per sortem.[10]

Here music is very briefly located among the mathematical Quadrivium as part of the classic system of seven Liberal Arts – still a familiar and influential system for the categorisation of knowledge in 1501, if no longer used systematically to shape curricula. The use of the term 'mathematician' as essentially a synonym for 'astrologer' is common practice around 1500, and it is striking to see musicians so unambiguously placed in the same category. Perotti's skepticism regarding astrology – which ran counter to a long tradition that viewed the science of the heavens as the chief Liberal Art, but was reasonably common among literary intellectuals in late fifteenth-century Italy – may seem remote from matters affecting the musician; but elsewhere in the *Cornucopiae* he applies exactly the same skepticism to musical spells and incantations, suggesting that for him very different efforts to interpret and affect the influence of the heavens exist in a kind of continuum of bankrupt mathematics. Perotti draws his examples from classical literature, but charms recited and sung were also a part of the contemporary street soundscape (they turn up in that context in Shephard and Rice's contribution to this volume), thus his point would probably be entirely legible to our reader, albeit an odd place to start in defining the discipline and practice of music.

In the *Problemata* index our reader finds a whole group of entries beginning with *musica* or similar. Three are concerned with the definition and nature of music, all pointing to Problem 19.1. The first entry, 'What is music and why it is so called' (Musica quid sit et unde dicitur), refers the reader to a passage of the commentary where Pietro d'Abano quotes general definitions of music from Boethius's *De musica* and Isidore's *Etymologiae*.[11] 'According to Boethius, *De musica* bk 5[.2], harmony is the ability to differentiate high and low sounds, by evaluating what is perceived according to

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[10] The column numbers provide by far the most effective reference system for the *Cornucopiae*, so we will not provide separate folio numbers. C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 5, 43.

[11] Index entry: *Problemata*, sig. aa [11] v. Content indicated: *Problemata*, fol. 169r. The printed folio numbers only begin with the *Problemata*; the index is unfoliated.

reason'.[12] 'According to Isidore in the *Etymologiae*, Music comprises the skill of melodious sound and singing; it is said to be knowledge of numbers applied to the proportioning of sounds'.[13] The second index entry relevant here, 'The elements of music' (Musice divisio), takes her to the next paragraph of the commentary, where the sources remain the same. Here we find Boethius' philosophical division of music into *mundana, humana* and *instrumentalis* – although Pietro d'Abano notes Aristotle's refutation of the notion of the harmony of the spheres in *De caelo et mundo*. Then we are also given Isidore's curricular division of music into harmony, meter, and rhythm.[14]

The third relevant entry in the *Problemata* index expands on the nature of music: 'Music is unity, which delights the soul, trains and moves the passions and soothes frenzies, tames the savage'.[15] This entry points to a passage on the value of music following straight on from the treatment of the elements of music our reader has just encountered.[16] In fact, the index entry is an almost direct quote from this passage; the only additional information not covered by the entry is the examples given in support (music makes soldiers brave, and helps us endure labour) and the classical source, which is Aristotle's *Politics* book 8. The final example given in support of this point is important enough to warrant its own index entry: 'A raging youth was calmed by Pythagoras with musical melodies' (Musicis melodijs sedatum fuisse a pythagora iuvenem furentem), a touchstone anecdote on the topic of music's power over the passions in both ancient and Renaissance writing on music.[17]

So far, our general-interest reader has gleaned a good deal of information about music from the *Problemata*, albeit that the abbreviated nature of the information raises questions about her ability to interpret and contextualise it correctly. She now knows the key classical authorities on music to be Boethius, Isidore, and Aristotle, all of whom are surely already familiar to her, at least by name. She understands that the discipline has two related but distinct facets: it concerns both expert musical performance, and the mathematical investigation of musical sounds in combination. She sees that

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[12] 'Que secundum Boetium musice 5 est armonice facultas differentias acutorum et gravium sonorum sensu ac ratione perpendens'. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 35. The text edited by Meyer is not identical to that in our 1501 edition, and of course does not include the index, but we will give cross-references nonetheless.

[13] 'Secundum vero Isidorum in ethymologijs est peritia modulationis sono cantuque consistens: dicitur etiam scientia numeri ad sonos proportiati'. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 35.

[14] Index entry: *Problemata*, sig. aa [11] v. Content indicated: *Problemata*, fol. 169r. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 35–6.

[15] 'Musice unitas est quia delectat animas exercitat affectus movet et furias placat silvestreque facit mansuescere'. *Problemata*, sig. aa [11] v.

[16] *Problemata*, fol. 169r. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 36.

[17] Index entry: *Problemata*, sig. bb [1] r. Content indicated: *Problemata*, fol. 169r. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 36.

a relationship of some kind has been proposed between sounding music, the music of the human soul, and the music of the heavens, but she knows the latter component of that relationship to be in doubt. She is aware that various aspects of sounding music, specifically harmony, meter, and rhythm, can be differentiated for separate study. Finally, and perhaps most importantly, she recognises that music is valued primarily for its capacity to influence the emotions and ethical states of listeners, something that can readily be observed in everyday experience.

Several index entries in the *Problemata* address the origins and history of music. One refers still to Problem 19.1, and once again it is almost a direct quote from the commentary: 'The inventors of music were Tubal Cain of the line of Cain before the flood, and after the flood Pythagoras of Samos'.[18] The commentary itself adds very little other than the sources of the information, namely Macrobius and Boethius. This represents a conventional accommodation between biblical and classical accounts of the invention of music. In a classical context, the proportions governing musical concord were discovered by Pythagoras when he overheard a blacksmith pounding his anvil with hammers of different weights. In Genesis 4:21–22 Tubal Cain is identified as a metalworker, and his half-brother Jubal as the ancestor of all musicians, thus the story was often transferred to their characters by Christian writers.[19] The blacksmith story of music's origins was well-known in fifteenth-century Italy: in visual representations of the seven Liberal Arts, the personification of Music is often accompanied by a blacksmith labelled 'Tubal Cain' as her representative expert.[20] Thus, even for our non-specialist reader, this may well reinforce something she already knows.

Three further index entries concerning the origins and history of music point to Problem 19.3:

Who were the inventors of the musical instruments and what were their names, and their strings, and how many strings they have.

Instrumentorum musicalium qui fuerint inventores et que sint nomina eorum et cordarum eorum et quot habeant cordas.[21]

Musical works at first comprised four strings up to the time of Orpheus.

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[18] 'Musice inventores tubal caim de stirpe caim ante diluvium post diluvium pythagoras samius ad sonitum maleorum'. *Problemata*, sig. aa [11] v. Content indicated: *Problemata*, fol. 169r. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 35.

[19] The key study of the relationship between these alternative inventors is James McKinnon, 'Jubal vel Pythagoras: quis sit inventor musicae?' *The Musical Quarterly*, 64 (1978), 1–28.

[20] See, among others, Tim Shephard, Sanna Raninen, Serenella Sessini and Laura Ştefănescu, *Music in the Art of Renaissance Italy 1420–1540* (London: Harvey Miller, 2020), 127–49.

[21] *Problemata*, sig. aa [10] v.

Musicator in principio constabat ex quatuor chordis usque ad tempora orphei.[22]

Coroebus son of Achis, King of Lydia, added a fifth string to musical instruments, the sixth [was added by] Hyagris Phyro, the seventh [by] Crepandus Milesibius in imitation of the seven planets.

Musicis instrumentis addidit quintam chordam corebus filius achis regis lidorum sextam hyagris phyro septimam crepandus. Milesibius ad similitudinem septem planetarum.[23]

Together, these phrases go well beyond reference entries to present an effective summary of the relevant passage of the commentary, which credits this information to the ancient mathematician Nicomachus of Gerasa via Boethius.[24] The information is somewhat garbled, both in the commentary (at least in this edition) and again further in the index. Coroebus son of Achis, who appears thus in both index and commentary, should be Toroebus son of Atys. The unknown Hyagris Phyro, called Hyagris Phrix in the commentary, should be Hyagnis Phrix (meaning 'of Phrygia'), famous player of the aulos and inventor of the Phrygian mode. The commentary attributes the seventh string to the kitharode Terpander of Lesbos ('terpandus lesbius'), not 'crepandus Milesibius' as stated in the index. We have been able to check the 'correct' readings in a modern translation of Boethius with a substantial critical apparatus; our 1501 reader certainly would not have been in a position to do the same.[25]

Although the index claims to reveal 'the inventors of the musical instruments [plural]', clearly here the instigation and development of ancient instrumental music is boiled down to the early history of the Greek lyre or cithara. In Italian writing about music around 1500, whereas specialist music theorists tend to default to part-song when explaining musical concepts, non-specialists often think in terms of a stringed instrument (cithara, lyre, lute) – partly as a classicising gesture imitating the centrality of the cithara in ancient Greek music theory, but also responding to the central position of stringed instruments in everyday secular musical experience in contemporary Italy.[26] Thus, although from a modern perspective the stringing of the ancient cithara might seem rather remote from our reader's context, very probably she already had the tools to assimilate what she

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[22] *Problemata*, sig. bb [1] r.

[23] *Problemata*, sig. bb [1] r.

[24] *Problemata*, fol. 169v. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 40.

[25] Boethius, *Fundamentals of Music*, trans. Calvin M. Bower, ed. Claude V. Palisca (New Haven: Yale University Press, 1989), 30–1.

[26] Further examples of the latter can be found in Tim Shephard, 'Aporia and the Harmonious Subject', in *Music and Visual Culture in Renaissance Italy*, ed. Chriscinda Henry and Shephard (New York: Routledge, 2023), 30–52, at 32 and 35.

found here into her musical worldview. The ancient cithara and lyre were considered closely equivalent to, and terminologically interchangeable with, several contemporary stringed instruments (viella, lira da braccio, cetra, lute, harp). This chordophone interoperability is richly represented in the visual culture surrounding our reader, where Orpheus and other classical musical heroes could be seen playing all of these instruments, ancient and modern. Therefore our reader was primed to see the ancient cithara as a direct ancestor of the stringed instruments that were central to her own musical experiences.

Even though all of this information found in the *Problemata* edition is gleaned from an index compiled around 1400 of a commentary written around 1300 on a text dating from the third century BCE, our reader would have encountered essentially the same key points, cited for the most part to the same authorities, in the introductory chapter of any Italian music theory treatise written in the late fifteenth or early sixteenth centuries. This speaks to the broader tendency of fundamental knowledge about music in Renaissance Italy to exist and circulate in the form of a series of brief classicising factoids – so-to-speak, musical commonplaces – something that is also visible in the conventionalised gestures of the *laudes musicae* derived from Quintilian's *Institutio oratoria*, which became a genre expectation when writing in a loosely humanist vein about music from the late fifteenth century.[27] It is interesting to note that the commentary to Problem 19.3 is actually extremely long and detailed, including specific information on the ancient Greek system of pitches and intervals; but so far as the indexer Curialti is concerned, none of this rather geeky information needs to be brought to the attention of the reference reader.

ENTRIES ON KEY CONCEPTS IN MUSIC THEORY

Having established the fundamental nature and origins of music, our reader now proceeds to look up some key concepts from music theory, beginning with 'harmony'. The *Cornucopiae* index entry *harmonia* sends us to column 1069 item B, where we find a definition that emerges coincidentally in rather an unexpected context:

> There were various doctrines of the philosophers about the mind, and some, like Aristoxenus, said: 'that there is no mind at all, but like the harmony of strings, from the arrangement of the body, and the structure of the viscera, there arises perception. For musicians call "harmony" the tuning and concert of strings sounding together without any [mutual] offense.'

Nam cum variae de mente philosophorum scientiae fuerint et quidam ut Aristoxenus. dixerit nullam esse: sed quasi harmoniam in fidibus ex constructione corporis: et compagibus viscerum vim sentiendi existere. musici enim intentionem concentumque nervorum in integros modos sine ulla offensione consonantium harmoniam vocant.[28]

Most of this passage is a direct quote from Lactantius' *De opificio Dei*, chapter 16, a text which was also printed several times around 1500. The definition of harmony in relation to the combining of strings is another example of the tendency among non-specialist writers on music, imitating ancient Greek music theory, to treat the lyre, cithara, or lute – rather than the choir, as might seem natural to a *maestro di cappella* – as the physical archetype of harmony. Whilst this aspect may seem to our reader so obvious as to pass without note, she will probably find the analogy of harmony to what a modern psychologist might call 'embodied cognition' more arresting, perhaps understanding it as an example of the *musica humana* she just read about in the *Problemata*.

In the *Problemata* index, *armonia* is one among a cluster of music theory terms for which we are directed to Problem 19.7, the other indexed terms being *antifonia*, *diafonia*, *diasema*, *dissonantia*, *eufonia*, *simphonia*, *tonus*, and the pair *arsis/tesis*. All of these terms are dealt with in one particular passage of Pietro d'Abano's commentary:

It should be noted that harmony, which is one of the three elements [of music], pertains to comedians and tragedians or chorus-members, and especially to those who sing with distinguished voice, for in them such harmony is sung, which is the attuning of notes and the concord or fitting together of many sounds. *Simphonia* is attuned notes fitted together from high and low concordant sounds – the opposite of which, indeed, is *dyaphonia*. *Euphonia* is the sweetness of the voice; moreover, melody (*melos*) is said to be as sweet as honey (*mellis*). *Dyasema* is an interval composed of two or more sounds. *Dyesis* is an interval characterised by a reduced tuning and an inclining of one sound towards another; Boethius however says that *dyesim* is half of a semitone. *Tonus* is a high pitching of the voice. *Arsis*, indeed, is the higher pitch; *tesis* the lower. Then, from *simphonia*, it follows that *antiphon* or *antiphonia* is a certain attuning and sounding against *simphonia*, like the sound which sooths the ear after its refraction.

Notandum quod armonia que est una trium partium pertinet ad comedos et tragedos vel choros et omnino ad eos qui precipue voce cantant: ex ea enim cantatur talis armonia que est vocis modulatio et concordia plurium sonorum vel coaptatio. Simphonia est vocis modulatio temperata ex gravi et acuto a concordantibus sonis: cuius quidem contraria dyaphonia: euphonia est suavitas

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[28] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 6, 245.

vocis: hec autem melos a mellis suavitate dicta: dyasema est vocis spacium ex duobus vel pluribus sonis coaptatum: dyesis est spacium quoddam deductionis modulandi et vergendi de uno in alterum sonum. Boetius autem dyesim dicit unius fore semitonij medium. Tonus est acuta vocis enunciatio. Arsis quidem vocis elevatio. Tesis depressio. Sic igitur ex simphonia potest haberi quod antiphon vel antiphonia sit quedam modulatio et intonatio contra simphoniam ut sonus qui post eam refrangitur auditum demulcens.[29]

We can extract from this paragraph the following definitions of the indexed terms:

armonia = the attuning of notes and the concord or fitting together of many sounds

antifonia = sound which sooths the ear after its refraction (opp. *simphonia*)

diafonia = opposite to *simphonia*, but otherwise undefined

diasema = an interval composed of two or more sounds

eufonia = the sweetness of the voice, from which melody is said to be as sweet as honey

simphonia = attuned notes fitted together from high and low concordant sounds (opp. *antifonia*)

tonus = a high pitching of the voice

arsis = the higher pitch [in an interval], *tesis* = the lower pitch [in an interval]

These granular definitions help our reader to unpack the much briefer definition of harmony credited to Aristoxenus in the *Cornucopiae*. She learns that *armonia* refers to the practice of fitting together sounds as a whole, *eufonia* to the sweetness of its effect, and *dias[t]ema* to a specific kind of fitting-together, namely an interval, which is a combination of a higher and a lower pitch. The remaining terms are applied to different kinds of intervals: 'concordant' (*simphonia*), and 'refracted' (*antifonia*). In contrast to the cithara-focussed passages discussed above, in which harmony is by implication a matter of successive pitches, here harmony is explicitly located within the domain of choral singing, concerned with pitches sounding simultaneously.

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[29] *Problemata*, fol. 171r. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 50–1. Most of this passage is paraphrased from Isidore (Etymologiae 3.19.2–9), but as he is not cited it seems unlikely our reader will be aware of the borrowing.

The nature of the difference between *simphonia* and *antifonia* remains not wholly clear after studying this passage, and our reader is relieved to find further information on this point when she follows up the index entry for 'Consonantia and dissonantia', which points to a passage in the commentary on Problem 19.16:

> It should be noted, following Boethius in *De musica* bk 1[.8], that 'Consonance is a blend of a high and a low pitch that falls sweetly and uniformly upon the ear. But dissonance is a harsh and unpleasant percussion of two sounds coming to the ear unmixed; for as long as they do not wish to be mixed with each other, and each of the two strives, as it were, to persist in its full identity, and interferes with the other, each is brought to the sense of hearing in a way that lacks sweetness'. It seems, indeed, as per the comment of Aristotle, that *antiphonus* is more delightful, arising from very distant contraries, such as from the lowest and highest strings. Consonance, however, arises from smaller differences, such as from middling strings, as will be seen hereafter.[30]

> Notandum secundum Boetium primo musice: quod consonantia est acuti soni gravisque mixtura suaviter uniformiterque auribus accidens. Sed dissonantia est duorum sonorum sibimet impermixtorum ad aurem veniens aspera atque iniocunda percussio: nam dum sibimet misceri nolunt: et quodammodo integer uterque nititur pervenire: cumque alter alteri obficit: ad sensum insuaviter uterque transmittitur. Videtur siquidem quantum facit ad sermonem Aristotelis quod antiphonus sit delectabilior ex contrarijs valde distantibus consurgens ut ex ypate et nete. Consonans autem quando ex non adeo differentibus sicut ex chordis medijs: ut apparebit consequenter.[31]

Unusually, this is a passage in which Pietro d'Abano is explicating the problem very directly, and his clarification at the end concerning *antiphonus* makes little sense unless you glance back at the problem itself. Aristotle is asking why *antiphonos* is more pleasant than consonance. In Bartholomew of Messina's very direct translation, the problem asks why *antifonus* is more delightful than *consono*. Theodore Gaza attempts to clarify the meaning of *antiphonus* by saying *dissonantium copulatio*, a 'coupling of dissonances which is called *antiphonum*'. That would indicate a contrast between consonance and dissonance, which is precisely what we get both in the index entry and in the passage quoted from Boethius. However, it would seem odd for Aristotle to assert that dissonance (i.e. *antiphonus*) is more pleasant than consonance (*consono*), when Boethius claims that dissonance is 'harsh and unpleasant'. Pietro d'Abano comes to the rescue on this point,

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[30] The translation of the quotation from Boethius is borrowed from David E. Cohen, 'Before and After John of Garland: The Concept of Directed Dyadic Progression and Its Prehistory', *Music Theory and Analysis*, 7.1 (2020), 63–112, at 71, but adapted, because our book does not exactly match the accepted modern reading of Boethius' Latin.

[31] *Problemata*, fol. 173r. C.f. d'Abano, *Expositio problematum*, ed. Meyer, 69.

explaining that *antiphonos* arises from very distant notes, such as from the highest and lowest strings of the lyre – in other words, it is an octave (although that specific conclusion is only clear if one knows the conventional tuning of a classical lyre). In contrast, he explains, it is smaller intervals that are called consonances. Both are pleasant, whereas it is unpleasant intervals of any size that are called dissonances.

Thus, assuming that our reader successfully figures out what is going on in this rather confusing passage, she will learn that *antifonia* is a particularly delightful interval between distant pitches (the obvious candidate being the octave), whereas *simphonia* refers to consonant intervals of middling size (by implication, smaller than an octave and larger than a tone). She will also find described the distinctive beating generated by a dissonant interval, a visceral component of acoustic sensation which she may well recognise from experience, and can now fit into a rudimentary scientific understanding of harmony.

Our reader notes perceptively that the *Problemata* defines *armonia* as a 'fitting together of *many* sounds', and *diasema* as 'an interval composed of two *or more* sounds' (my emphasis), whereas the intervals that have been precisely described seem to involve only two pitches, a higher and a lower. The possibility that harmony might involve the combination of more than two pitches is confirmed when she looks up *concento* in the *Cornucopiae* index, and reaches the following passage (in column 616, the one that was surely intended by the index entry *musica*, as she may now realise):

> There are those who distinguish between Cantors, Occentors, and Succentors, in this manner: Cantors are those who sing very high in a piercing fashion, Succentors are those who sing very low, and Occentors are those who hold the middle ground between both; this variety, if music's rational accord is maintained, has a wonderful result. Equally, from 'I sing' (*cano*) [derives] 'I sing together' (*Concino*), from which the frequentative verb 'I harmonise' (*Concento*), and 'singing in harmony' (*Concentus*), which is the regulation (*modulatio*) of different voices. 'To harmonise' (*Concinere*) is 'to convene' (*Convenire*), since from many diverse voices one sound is made. From this derives another verb: 'I arrange' (*Concinno*), 'you arrange' (*concinnas*), which is 'I compose aptly' (*apte compono*), and almost 'I cause to assemble' (*convenire facio*).

> Sunt qui Cantorem: Occentorem: et Succentorem ita distinguant: ut Cantores sint: qui maxime elevant: atque acuunt vocem. Succentores: qui minimum Occentores: qui inter utrumque medium tenent: quae varietas mirabilem servata musica ratione concentum reddit. Item a cano Concino: a quo frequentativum Concento: et Concentus: quod est diversarum modulatio vocum Concinere. convenire est: ut cum e multis diversis vocibus unus efficitur sonus. Ab hoc fit aliud verbum Concinno concinnas: quod est apte compono: et quasi convenire facio.[32]

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[32] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 108.

Although the part-names are a little eccentric, this passage reads as an unambiguously polyphonic and choral view of harmony, involving three independent voices singing in different ranges simultaneously, and our reader would surely have found it easy to connect with her experience of various contemporary genres commonly sung in three parts, such as improvised counterpoint above plainchant, laude, and carnival songs – whether or not she is aware of these as distinct musical categories with particular technical features beyond their three-part arrangement. She also picks up from this passage the important principle of variety brought to accord through reason, a core value of classicising aesthetics across the musical, literary, visual, and architectural arts in Italy around 1500 that was often encapsulated through the example of musical harmony. Indeed, the phrase 'from many diverse voices one sound is made' recalls to her mind a statement from one of the *Problemata* index entries she looked at before, 'Music is unity', which she did not really understand at the time, but she now sees that it is in the nature of harmony to unify things that are different.

This excerpt comes from Perotti's commentary pertaining to Martial's *De spectaculis* epigram 5. When reading it in the modern critical edition, which retains the fundamental organisation as a commentary on Martial from Perotti's partly autograph presentation manuscript prepared in the late 1470s, it is clear that the word 'canit' in the final line of the epigram has called forth a long and relatively focussed passage of commentary on music.[33] Realising this might prompt one to read more from this portion of the *Cornucopiae* straight away. However, the deduction is more difficult to make when working from our 1501 edition, in which the structuring as a commentary is harder to pick out, having been overtaken in prominence by the structuring as a reference work answering to an alphabetical index. Our reader, who has already accepted the index as her guide, overlooks this opportunity.

Our reader comes away from this phase of her investigation with the clear impression that the theory of sounding music is primarily a theory of harmony, which is concerned with the rational combination of high and low sounds such that their differences are harnessed to a pleasing unity. (She recalls from earlier index entries that harmony is one of the three branches of music theory named by Isidore, and that the rational nature of harmonious combinations can be understood mathematically, as was first discovered by Tubal Cain or Pythagoras.) Additionally, she has encountered the sensory metaphor of 'sweetness', which was perhaps the most common way to convey the pleasing nature of harmonious unity in her immediate context, and may therefore have already been familiar to her. She understands that harmony can exist between two, three, and perhaps more pitches sounding simultaneously, and moreover that it can be formed by combinations of pitches that are

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[33] Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 107–27.

distant or those that are closer together. She knows, at least in outline, that not all combinations of sounds are pleasant: those that are can be called consonances, whereas those that are not can be called dissonances. Some of the other terminology she has learned, however, is not commonly in use among musicians in 1501, and may cause confusion and embarrassment when she deploys it in a future conversation. Certainly our reader could find a much more detailed treatment of all these aspects in a contemporary music theory treatise, but what she has from our two encyclopedias is already enough to sound well-informed in casual conversation.[34]

ENTRIES ON SONG

At this point our reader has reached the end of the *Problemata* index's contribution to her investigation. There was scope for Curialti to take a lot more out of Pietro d'Abano's commentary, which is actually a very compendious music treatise offering detailed explanations of both ancient and medieval music theory. The selection is thus significant. Apparently Curialti felt his readers would want to have easy access to summary information on the fundamental nature of music, the structure of music as an academic discipline, its ancient origins and the names of its inventors, as well as concise definitions of key concepts in the theory of harmony – and nothing else. (Material more indirectly related to music, such as that concerning the voice, is also represented in the index, but it is not the subject of our reader's current enquiries.)

There is still more to learn from the *Cornucopiae*, however, and our reader proceeds to look up various terms for song, finding that *canticum, cantilena, cantio, cantiuncula, canto*, and *cantus* are all handily listed together in the index, all referred to column 630. Perotti's material on song begins with grammatical matters, which add little to our reader's musical understanding:

> From 'I sing' (*canto*) derives the frequentative verb 'I sing often' (*cantito*), and 'sung' (*cantus*), and 'song' (*cantio*), whose diminutive is 'mere song' (*cantiuncula*), and 'song' (*canticum*), which properly means a song that is elegant and wanton.

> A canto vero fit Cantito frequentativum et Cantus: et Cantio: cuius diminutivum est Cantiuncula: et Canticum: quod proprie significat elegantem cantum atque lascivum.[35]

Next, he gives a quote from Quintilian's *Insitutio Oratoria*:

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[34] For a summary of the content of contemporary music theory treatises, see Bonnie J. Blackburn, 'Music Theory and Musical Thinking after 1450', in Reinhard Strohm and Bonnie J. Blackburn (eds.), *Music as Concept and Practice in the Late Middle Ages* (Oxford: Oxford University Press, 2001), 301–45.

[35] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 125.

According to Quintilian: 'The reading of the poets should be with charm and dignity, and indeed different from prose, because it is song (*carmen*), and poets themselves claim to be singing (*canere*), although it shouldn't degenerate into actual singing (*canticum*)'.

Quintilianus. Sit poetae lectio cum suavitate quadam gravis: et non quidem prosae similis: quia carmen est: et se poetae canere testantur: non tamen in canticum dissoluta.[36]

This effectively introduces the thorny issue of the relationship between poetry and song, encapsulated in the word *carmen*, whose meaning sits ambiguously between the two. Our reader has no difficulty seeing the relevance of this issue to her own literary and musical experience: although Quintilian (and Perotti) is thinking of ancient Greek and Roman poets, his observations apply equally to her Italian contemporaries. Quintilian wants to differentiate the musical quality of poetic recitation from actual singing, which by strong implication is of lower status and value, and morally suspect. Some Italian *literati* of the fifteenth century felt the same way, as our reader may already be aware. However, what our reader certainly already knows is that poems are indeed often sung, especially poems that are 'elegant and wanton'; thus, the final clause of Quintilian's comment may strike her as unrealistically conservative, within her own musical context.

Next Perotti turns to Greek terms for song:

The Greeks call song 'hymn' (*Hymnum*), and also 'psalm' (*Psalmum*). But, properly that is called 'hymnus' which is done with the natural voice; 'psalmus' with any musical instrument, from which derives 'psalmody'; 'mixed song' that which is sung to the cithara, or another musical instrument. Hence also 'psaltery' (*psalterium*), a musical instrument known everywhere, and 'female psaltrist' (*Psaltria*), 'female citharist' (*fidicina*). But 'psalm' (*psalmus*) also derives ἀπό τοῦ ψάλλω [lit: from the (word) *psallo*], which means 'I sing' (*canto*). And [similarly] 'singer' (*cantator*), 'female singer' (*cantatrix*), 'old song' (*cantilena*), and *canta* which the ancients used for *cantata* (sung).

Graeci canticum Hymnum vocant. Item Psalmum. Sed proprie hymnus dicitur: qui voce naturali fit Psalmus: qui aliquo musico instrumento: unde psalmodia deducitur. Canticum mixtum: ut cum aliquis ad citharam: sive aliud musicum instrumentum canit. Hinc etiam Psalterium instrumentum musicum vulgo notum: et Psaltria fidicina. Psalmus autem ἀπό τοῦ ψάλλω derivatur quod significat canto. Et Cantator: et Cantatrix: et Cantilena: et Canta quo veteres pro cantata usi sunt.[37]

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[36] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 125.

[37] It seems that the typesetter is unfamiliar with Greek, using 'ω' for 'π', and 'N' or 'µ' for 'ν'. The substitutions have been corrected in the transcriptions for clarity, but our reader has no Greek so it makes little difference to her anyhow. C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 125.

Perotti is concerned with the ancient Greek meaning of 'hymn' and 'psalm', not with their contemporary usage in church music (with which our reader is surely familiar), and the considerable difference in meaning may cause our reader some momentary confusion. Perotti differentiates 'hymn' and 'psalm' by saying that hymns are sung by voice alone ('natural voice'), whereas psalms are accompanied, hence the term 'psalmody', which originally referred to a song accompanied on a stringed instrument (a meaning still reflected in Renaissance representations of King David singing to a harp or lyre). He also gives a Latin term for accompanied song, 'canticum mixtum', although there is scope for confusion here too because various late medieval music theorists used the term 'cantus mixtus' in completely different ways (of which, luckily for her, our reader is probably ignorant).

Next Perotti brings the discussion onto the topic of charms and spells:

> Of old there was the custom, and it survives even today, that men should use certain composed words in the resemblance of song (*carminis*), with which they think that they can both call forth the gods, and speak with them, and generate storms and tempests, and draw out serpents, and cure diseases, and open doors without keys, and uncover secrets, and obtain love, and also endless other similar things against nature.

> Quoniam autem mos veterum fuit: constanterque in hanc usque aetatem durat: ut verbis quibusdam ad carminis similitudinem compositis homines utantur: quibus credunt se et elicere deos posse: et cum eis colloqui: et tonitrua ac tempestates provocare: et serpentes contrahere: et morbos curare. Et hostia sine clavibus aperire: et secreta scrutari: et amorem sibi conciliare. Et alia huiusmodi infinita etiam contra naturam.[38]

He notes that 'I sing' (*canto*) is sometimes used as a poetic substitution for 'I enchant' (*incanto*), and that poems (*carmina*) are sometimes used as enchantments (*incantationibus*), giving several examples from Virgil and Pliny. With evident disgust, he concludes 'It is astonishing that this type of folly so overran the minds of men that even learned men and whole peoples persuaded themselves that it is the truth'.[39] Our reader is here reminded of Perotti's suspicion of 'mathematicians' and their spurious prognostications.

So far our reader has learned that songs are essentially of two types, accompanied and unaccompanied; that some of them are lascivious; and that there is a considerable degree of overlap amongst poetry, songs, and spells, which some may find uncomfortable. The enchanting power of song she knows

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[38] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 125.

[39] 'Quod genus stulticiae mirum profecto est ita in hominum mentes invasisse: ut viri etiam docti: et toti populi id verum esse sibi persuaserint'. C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 126.

from earlier phases of her investigation to be somehow related to mathematics, and therefore to harmony; in her mind she is now forming a connection between the musical enchantment critiqued by Perotti, the *musica humana* she read about before, and the capacity of music to move the emotions. She is undoubtedly already familiar with the idea that lascivious songs might harm one's morals, a commonplace in the surrounding culture, and now finds herself equipped with new ways to contextualise that effect, and to think through its mechanism.

Having been reminded by Perotti that *carmen* can be a synonym for *cantus,* our reader now thinks to look up *carmen* in the index, and is taken to column 619. Here she finds the intertwinings of poetry and song even further explored, beginning from an etymological perspective:

> Moreover, 'poem' (*Carmen*) derives from 'I sing' (*cano*), almost as if it were called *canimen.* Also, it is said that each poem (*carmen*) is held together by feet (*pedibus continetur*); this is why Virgil called [just] one verse (*versum*) a poem (*carmen*): 'And I inscribed the matter in a verse (*carmine*): Aeneas dedicates these arms taken from the victorious Greeks' [Virgil, *Aeneid*, 3.274-88] … Indeed, all of Virgil's *Aeneid* is said to be a heroic poem (*carmen*); the entire book of the *Georgics,* the agricultural poem (*carmen*); the entire book of the *Eclogues,* the pastoral poem (*carmen*).

> Praeterea a cano Carmen: quasi canimen appellatum. Dicitur autem carmen quicquid pedibus continetur: unde Virgilius versum unum carmen vocavit. Et rem carmine signo Aeneas haec de danais victoribus arma et duos similiter. … Tota praeterea Aeneis Virgilii Heroicum carmen dicitur. Totus georgicon: liber carmen georgicum. Totus liber bucolicon carmen bucolicum.[40]

Quintilian's point that poems are called songs, and poets claim to be singing, is here thickly underlined; and at the mention of poetic feet our reader recalls that meter, which she now knows (following Isidore) to be a branch of music, was covered by her childhood grammar tutor as an aspect of poetics. These realisations cause a pause for thought because she remembers that at the beginning of her investigation she found Perotti calling music a mathematical discipline numbered among the Quadrivium, whereas she knows grammar, and indeed poetry itself, to be a literary discipline counted among the Trivium. Thus she finds herself caught between a quadrivial view of music founded in Boethius, which in 1501 is beginning to feel a little old-fashioned, and a trivial view of music leaning on Quintilian, which has the more novel and fashionable cachet of literary classicism. Both are necessary to the musical worldview she is acquiring through her evening's study, but both are also somehow in tension.

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[40] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 4, 112.

Our reader now has the sense that her investigation is beginning to wind down. However, having encountered so many references to the cithara, she is loathe to stop before looking that up in the *Cornucopiae* index, and thereby finds her way to column 1206:

> Κιθάρα is a Greek word referring to a well-known musical instrument, which was played by Orpheus. Indeed, to the cithara, or rather the lyre, the songs of the poets (*vatum*) were wont to be sung. … The cithara was first invented by Amphion, or others prefer Orpheus, and some assign it to Linus. Terpander added seven strings, the eighth Simonides, the ninth Timotheus. The cithara was first played without the voice by Thamyras, then with song by Amphion.

> κιθάρα graeca vox est: significat que musicum instrumentum vulgo notum quo usus est orpheus: ad citharam enim sive lyram cantari vatum carmina solebant: … Citharam primus invenit amphion (ut alii volunt) Orpheus: quidam Lino tribuunt. Septem chordas addidit Terpander. octavam Simonides. nonam Timotheus. Cithara sine voce primus cecinit Thamyras: cum cantu Amphion.[41]

Our reader's expectations are here confirmed, in that the cithara figures as a kind of tool and symbol for the unity of poetry and song, as it has in other passages she has read. She notes that Perotti treats the cithara as essentially synonymous with the lyre, and accordingly she turns to the index one final time and looks up 'lyre', leading to another passage on the same topic spanning columns 292 and 293:

> The Greeks, indeed, call the variety of voices λιγυρόν [*ligyron*, clear-sounding], from which some think the lyre (*lyram*) was named, a musical instrument, in which there are as many resonant voices as there are strings, thus ἀπό τοῦ λύειν [lit: from the (word) *lýein*], which is 'to sing' (*canere*).[42] From this are named the 'lyric' poets, since they make use of varied songs (*carminibus*), and they sing to the lyre, and their song itself is called 'lyric'.

> Graeci enim λιγυρόν vocum varietatem dicunt: unde quidam Lyram vocatam existimant: instrumentum musicum: in qua quot fides sunt: tot resonant voces: vel ἀπό τοῦ λύειμ: quod canere est: hinc Poetae lyrici dicti: quod variis carminibus utuntur: et ad lyram canunt: et Carmen ipsum lyricum nominatur.[43]

Perotti goes on to explain how the lyre was invented by Mercury after he found he could make a sound by plucking sinews left over on an empty tortoise shell, and how Orpheus then used it to make melodies so sweet that they moved

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[41] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 7, 206.
[42] This is not in fact the meaning of the word. The etymological intention here is unclear.
[43] C.f. Perotti, *Cornu Copiae*, ed. Charlet and Furno, Vol. 2, 193.

trees, rocks, and brute beasts; then he disappears off on a tangent about Orpheus' grizzly end. Here, in the realm of Orpheus, our reader finally feels herself to be on familiar territory. Orpheus is a ubiquitous character in Italian literary and visual culture in the late fifteenth and early sixteenth century, his exceptionally affective musicianship the paradigmatic example of music's power over the passions, his identity as both poet and musician the conventional foundation upon which to build classicising claims for the ideal unity of poetry and music.[44]

CONCLUSIONS

By this point the light is fading and our reader decides that her investigation is at an end. Before going to bed, she reflects on what she has learned, in order to form a clear memory of the key points, ready for use in future conversations with her friend. Certainly, thanks to these two encyclopedias and their indexes, she is now in a much better position to sound well-informed when discussing music. She can identify Tubal Cain or Pythagoras as the inventor of music. She can name-check Boethius and deploy his categories of *musica mundana*, *humana*, and *instrumentalis*, at least in outline, casting doubt on the *mundana* component (citing the authority of Aristotle), and connecting the *humana* component with the power of music to move the emotions (for good and for ill). She can name-check Isidore, mentioning that music is studied as both a practical skill and a mathematical discipline, and noting that in the latter guise it belongs in the Quadrivium. She can show a rudimentary awareness of both harmonics and metrics. She can explain that harmony is the practice and the science of combining two or more sounds, making a sweet and pleasant unity out of their varied high and low pitches by controlling consonance and dissonance. It is obvious to her that this is what is accomplished in contemporary part-song, and also in accompanied song, even if she cannot precisely spell out how. She can also discuss metrics in general terms as the study of the musical qualities of poetry, and maintain a constructive ambiguity on the differentiation of poetry from song, mentioning Quintilian as an authority on the unity of poetry and music. She can appreciate the ancient cithara and lyre as the direct ancestors of the instruments she commonly hears accompanying song, even mentioning some of those who innovated their design, and she can speak as if Orpheus and Amphion are essentially of a piece with the singer-songwriters of her own day. All in all, she can feel satisfied with her progress.

There is much more that our reader could learn about music from these two 1501 editions, with or without the help of their indexes. Book 19 of the *Problemata*, which is entirely devoted to music, runs for 26 pages in our edition, and the index barely scratches its surface. Books 11 and 32 – on the voice and ears respectively – are richly represented in the index, and could

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[44] See, among others, Shephard et al., *Music in the Art of Renaissance Italy*, 171–89.

certainly offer further relevant insights.[45] Meanwhile, lurking in the *Cornucopiae* are further musical terms that our reader has not thought to look up within the scope of her current enquiry, including more theoretical concepts such as *melodia* (melody) and *modulamen* (mode, melody), more instruments (e.g., *cornu, tibia*), and more mythological musicians (Pan). Also represented, as in the *Problemata*, are index terms more indirectly related to music, such as *auditus* (hearing), *vox* (voice), and *sonus* (sound). From the point of view of our reader's particular objective, though, which was to sound well-informed when conversing about music with a friend, it seems likely that further investigations would yield diminishing returns.

Our experiment looking up musical terms in these indexes has been fictitious, but it has also been real because this is precisely what indexes are for. If there were no realistic prospect of a reader doing some version of what we have just done, in relation to music or some other subject, the indexes would have been redundant and the printers would have saved a great deal of ink and paper by removing them. In a sense, our hypothetical historical scenario is more realistic in its representation of the circulation and acquisition of musical knowledge from books in the period than that implied by the process of preparing a critical edition of a music theory treatise, or conducting a search in the online *Thesaurus musicarum latinarum.* If our findings do not add up to an exciting and subtle new reading of Renaissance music theory, that is precisely the point. Most people reading for musical knowledge in Italy around 1501 did not need and did not want a deep and coherent understanding of counterpoint technique, or proportions, or modes. It was and is perfectly possible to hear, sing, enjoy, and discuss most Italian songs of the period with only the sketchiest understanding of such specialist matters. On the other hand, for such participation it seems likely that it *was* very useful to share a musical worldview characterised by overlapping and sometimes contradictory musical structures, stories, concepts, and values, essentially identical to that which our happy reader has now acquired.

In the introductory section of this essay, we warned that reading for musical knowledge in Italy in 1501 was not an activity necessarily characterized by the sense of satisfaction arising from a story well told. Knowing about music is not a completed action with a single coherent outcome, but rather a continuing process stretching across several discontinuous but overlapping domains of acoustic experience, each with their own characteristic practices and opinions. In Renaissance musicology there has been a tendency to treat 'musical knowledge' as synonymous with music theory – and even specifically with the music theory associated with church counterpoint, as explained by professional church musicians with a garnish of 'humanist'

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[45] Musically relevant content in Book 11 is transcribed and summarised in Burnett, 'Hearing and Music'. As Burnett observes, from a musical perspective the content of Book 32 is disappointing.

erudition. A great deal of scholarship has been devoted to uncovering the ways in which this particular body of musical knowledge 'makes sense'. The purpose of this essay has been to show how 'making sense' may not in fact be particularly characteristic of everyday musical knowledge. Often the introductory materials of a specialist Italian music treatise c.1500, presenting a more-or-less conventionalised jumble of classicising musical citations and factoids in a frankly embarrassing effort to assert the importance and antiquity of the subject, are given the least attention by musicologists because they seem least relevant to 'the music' (by which we mean notated church counterpoint). It is interesting to note, however, that it is precisely this portion of a music treatise whose contents are most extensively shared with non-specialist discussions of music, and thus are most closely related to 'everyday musical knowledge'. That relationship encompasses both their key points and concepts, their principal sources, their jumbly character, and their disinclination to connect in a direct and expert manner with technical features of polyphony. If it is undeniable that the approach taken in this essay has not produced a neat and illuminating outcome, it is equally true that its messiness and uncertainty is a genuine reflection of the historical reality.

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Abstract

A modern user of a printed encyclopedia expects to find concise entries on a wide range of subjects organised alphabetically for ease of reference. In the fifteenth and sixteenth centuries a number of scholarly texts of a particularly long and wide-ranging character were essentially 'encyclopedized' through the provision of compendious subject indexes, appearing before the start of the text in some printed editions, to facilitate reference use. Two such texts that enjoyed a particular spike in Italian printed editions in the decades either side of 1501 were Niccolo Perotti's Cornucopiae, and the Aristotelian (or rather pseudo-Aristotelian) Problemata, which was sometimes packaged together with Problemata by Alexander of Aphrodisias and Plutarch. Working with 1501 'encyclopedized' editions of both texts, this essay asks a simple question: what would a reader learn by looking up music-related terms in the indexes?