

Ancient Greek Music Theory in the Context of Historiography: Filling a Lacuna in the Study of the Greek *Systema Teleion* — The *Music of Ancient Greece: An Encyclopaedia* (1978) by Solon Michaelides¹

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Ancient Greek Music in the Context of Its Revival During the Era of Humanism

During the era of humanism, spanning the period from approximately 1400 to 1600, people of various paths of life and disciplines displayed a keen interest in the discovery of the ancient fascination with learning, an endeavour which took those interested in this inquiry back in time to the centuries prior to the common era (B.C.E.), and as such to the Greek, Byzantine, Judaic, and Arabic traditions.² This fascination and preoccupation with various disciplines, such as the *quadrivium*, comprising arithmetic, geometry, astronomy and music, and the *trivium*, comprising grammar, dialectics, and rhetoric, with the disciplines of the *quadrivium* and *trivium* also known as the *artes liberales*,³ key to the curriculum of the *facultas artium*, furthermore the *artes mechanicae*,⁴ and finally those disciplines located outside the realm of these two categories of classifications, such as theology, medicine, and law, all situated within the university curriculum,⁵ in turn rendered invaluable insights into the theory and practice of each discipline identified during the Greek and Byzantine eras and also during the Middle Ages and the Renaissance.⁶ With regard to the discipline of *musica*, the three strands of contemplation, that is, *musica theoretica*, in reference to the abstract theory explored largely through Pythagorean arithmetic, *musica practica*, in reference to the art of composition and performance, and *musica poetica* were generally treated as separate entities in the

1 A shorter version of this paper was presented at the International Conference “Solon Michaelides: Life, Work and Legacy” at the UNESCO Amphitheater, University of Nicosia, Cyprus, on Saturday, May 14, 2016 as part of Session 3, chaired by Professor Dr. Kenneth Owen Smith (University of Nicosia). The author wishes to thank Professor Dr. Vasilis Kallis (University of Nicosia) for his reading of the paper at this event.

2 Claude V. Palisca, *Humanism in Italian Renaissance Musical Thought* (New Haven, CT: Yale University Press, 1985); Ann E. Moyer, *Musica Scientia: Musical Scholarship in the Italian Renaissance* (Ithaca, NY: Cornell University Press, 1992); see also Paul Oskar Kristeller, “The Renaissance and Byzantine Learning,” in *Renaissance Concepts of Man and Other Essays*, ed. Paul Oskar Kristeller (New York: Harper and Row, 1972), 64-109.

3 Josef Koch, *Artes liberales: Von der antiken Bildung zur Wissenschaft des Mittelalters* (Leiden: Brill, 1959); David L. Wagner, ed., *The Seven Liberal Arts in the Middle Ages* (Bloomington: Indiana University Press, 1983; repr., 1986); Joseph Dyer, “The Place of Music in the Medieval Classifications of Knowledge,” *The Journal of Musicology* 24 (2007): 3-71.

4 George Orvitt, Jr., “The Status of the Mechanical Arts in Medieval Classifications of Learning,” *Viator* 14 (1983): 89-105.

5 Nancy van Deusen, *Theology and Music at the Early University: The Case of Robert Grosseteste and Anonymous IV* (Leiden: Brill, 1995); Werner Friedrich Kümmel, *Musik und Medizin: Ihre Wechselbeziehungen in Theorie und Praxis von 800 bis 1800* (Freiburg im Breisgau: Alber, 1977); Heinz Grieser, *Nomos: Ein Beitrag zur griechischen Musikgeschichte* (Heidelberg: Im Selbstverlag von F. Bilabel, 1937).

6 Thomas J. Mathiesen, “Hermes or Clio?: The Transmission of Ancient Greek Music Theory,” in *Musical Humanism and Its Legacy: Essays in Honor of Claude V. Palisca*, ed. Barbaro Russano Hanning and Nancy Kovaleff Baker (Lewiston, NY: Edwin Mellen Press, 1992), 3-35.

written discourse, transmitted in manuscripts.⁷ Even after 1480, the year of the publication of Franchino Gaffurio's *Theoricum opus musice discipline* in Naples, the first published volume devoted to *musica speculativa*, as an alternative designation of *musica theorica*, to appear in print, theorists retained the strict separation of the two avenues of investigation, as is readily seen in the trilogy of Gaffurio (1451-1522), issued in Milan between 1492 and 1518: the revised version of the aforementioned *Theoricum opus musice discipline* (1480), the *Theorica musice* (Milan, 1492), the *De harmonia musicorum instrumentorum opus* (Milan, 1518) devoted to the examination of the *tonoi* of the Greek *systema teleion*⁸ and the Latin modes of Guido of Arezzo (991/92-after 1033),⁹ and the *Practica musicae* (Milan, 1496) concentrated on the art of composition with recourse to the mensural notation of Philippe de Vitry (1291-1361) disclosed in the path-breaking *Ars nova* (ca. 1320)¹⁰ and applied in compositions of members of the Burgundian Court, among them Guillaume Dufay (1397-1474), Gilles Binchois (ca. 1400-1460) Antoine Busnoys (ca. 1430-1492), and Pierre de la Rue (ca. 1452-1518), and the Netherlands School of Composition, among them Josquin Desprez (born ca. 1450-1455; died 1521), Johannes Ockeghem (ca. 1410-1497) and Jacob Obrecht (1457/58-1505).

Notwithstanding the interest in *musica practica* by theorists and practitioners of the art of music, including composers and performers, throughout the period of musical humanism, a new interest, spurred by the true revival of an Italian Renaissance in music, awoke across a broader constituency of the population. Such interest was perpetuated by the collecting of written accounts on music preserved in manuscripts and through the ardent efforts of manuscript hunters placed into libraries of higher learning, such as monasteries and universities.¹¹ These precious documents, which provided for interesting discussions in learned circles, such as the Florentine Camerata, offered important insights into the origin of music, key to the revival of the ancient traditions, including the Roman, Greek and Byzantine traditions, and that not as separate entities but rather as a *continuum* in the broader unfolding of culture, as a function of historiography.¹² So pronounced was the fascination with past eras that both the Greek and Byzantine traditions were kept alive during the period of humanism and beyond.¹³

The Scholarship of Solon Michaelides in the Context of Music and Music Theory of Ancient Greece: The Rekindling of Interest in the 1970s

The unprecedented interest in the music of ancient Greece during the 1970s, based on the ready availability of the reliable editions of Greek writings, a venture spearheaded in particular by B. G. Teubner, resulted in the publication of a number of monographs and bibliographies of primary and secondary sources.¹⁴ After the appearance of these volumes, with each publication focussed

7 Charles André Barbera, "The Persistence of Pythagorean Mathematics in Ancient Musical Thought" (PhD diss., University of North Carolina at Chapel Hill, 1980); Peter A. Evans, *Musica Theoretica and Musica Practica: A Persistent Dichotomy—University of Southampton Inaugural Lecture Delivered at the University on May 9, 1963* (Southampton: University of Southampton, 1963); Heinrich F. Plett, *Rhetoric and Renaissance Culture* (Boston: de Gruyter, 2004).

8 Thomas J. Mathiesen, *Apollo's Lyre: Greek Music and Music Theory in Antiquity and Middle Ages* (Lincoln: University of Nebraska Press, 1999).

9 Joseph Smits van Waesberghe, ed., *Guidonis Aretini: Micrologus* (Rome: American Institute of Musicology, 1955).

10 John Douglas Gray, "The Ars Nova Treatises Attributed to Philippe de Vitry: Translations and Commentary" (PhD diss., University of Colorado at Boulder, 1996).

11 Palisca, *Humanism*, 23-50.

12 Claude V. Palisca, *The Florentine Camerata: Documentary Studies and Translations* (New Haven, CT: Yale University Press, 1989).

13 Claude V. Palisca, *Music and Ideas in the Sixteenth and Seventeenth Centuries* (Urbana: University of Illinois Press, 2006).

14 Reinhold Merkelbach, "Die Altertumswissenschaft bei Teubner," in *Wechselwirkungen: Der wissenschaftliche Verlag als Mittler: 175 Jahre B. G. Teubner, 1811-1986*, ed. B. G. Teubner (Stuttgart: B. G. Teubner, 1986), 13-26; Egert Pöhlmann, *Denkmäler altgriechischer Musik* (Nuremberg: H. Carl, 1970); Thomas J. Mathiesen, *Ancient Greek Music*

on a number of carefully selected aspects of ancient Greek music, Jacques Chailley (1910-1999) suggested the idea of a musical lexicon on Greek music of Antiquity in a scholarly paper,¹⁵ with the notion of a lexicon on Greek music first realized in 1835,¹⁶ an endeavour which in turn signalled a renewed interest in Greek music of Antiquity beyond the end of the nineteenth century.¹⁷ Eventually, Solon Michaelides (1905-1979) engaged in a broader and thus a more comprehensive coverage of the main topic in his *The Music of Ancient Greece: An Encyclopaedia*,¹⁸ a publication for which the author received a major prize by the Academy of Athens on December 29, 1977, a year prior to the release of this volume.¹⁹ His diverse training, as a student of Nadia Boulanger (1887-1979) in harmony, counterpoint, and fugue, of P. Marie and Alfred Cortot (1877-1962) in piano at the *École normale* in Paris, of Richard Thiberger in music pedagogy and piano at the *Institute de pédagogie musicale* in Paris, of Guy de Lioncourt (1885-1961) in composition at the *Schola cantorum* in Paris, and of Marcel Labey (1875-1968) in conducting, also at the Schola Cantorum, is fully borne out in his compositions, often reflecting his ethnomusicological interests and his interest in ancient Greek music and music theory, in particular the ancient Greek modes, the foundation of the *systema teleion*,²⁰ with numerous orchestral and stage works as well as cantatas, other choral works, chamber music, and solo instrumental works to his credit.²¹ As author of books on Cypriot music, neo-Hellenic folk music, modern Greek music, the music of England and Finland, and on the harmony of modern music as well as articles on folk music,²² the literary activities of Michaelides culminated in his preparation of the encyclopedia on ancient Greek music, the first full-scale publication of such a broad scope in the English language. With his immense interest in and commitment to pedagogy, reflected in his teaching of guitar and choral pedagogy at the Cypriot Conservatory in Limassol, which he founded in 1934, and his teaching of composition, conducting, counterpoint,

Theory: A Catalogue Raisonné of Manuscripts. Répertoire Internationale des Sources Musicales, ser. B, vol. 9 (Munich: Henle, 1988).

- 15 Jacques Chailley, "Contribution à une lexicographie musicale de la Grèce antique," *Revue de philologie, de littérature et d'histoire ancienne* 51 (1977): 188-201.
- 16 Friedrich von Driberg, *Wörterbuch der griechischen Musik in ausführlichen Artikeln über Harmonik, Rhythmik, Metrik, Kanonik, Melopöie, Rhythmpöie, Theater, u.s.w.: Nach den Quellen neu bearbeitet* (Berlin: Schlesinger, 1835).
- 17 For a survey of the secondary literature, including Greek music theory, beginning with the 1890s and extending to the scholarship of Hugo Riemann (1849-1919) and Hermann Abert (1871-1927), see Ernst Graf, "Über den Stand der altgriechischen Musikforschung," in *Bericht über den Zweiten Kongress der Internationalen Musikgesellschaft, Basel 1906*, ed. Oskar von Hase *et al.* (Leipzig: Breitkopf & Härtel, 1907), 154-60.
- 18 Solon Michaelides, *The Music of Ancient Greece: An Encyclopaedia* (London: Faber and Faber, 1978); also in Greek version as Solon Michaelides, *Εγκυκλοπαίδεια της αρχαίας Ελληνικής μουσικής* (Athens: National Bank Cultural Foundation, 1982; repr. 1989, 2003).
- 19 This information is provided on a typed note on a blue sheet of paper as a loose insert in the volume.
- 20 Henri Potiron, *Les modes grecs antiques* (Paris: Desclée, 1950).
- 21 Individual compositions written by Solon Michaelides are identified on the website of the Solon Michaelides Cultural Foundation. For a discussion of Solon Michaelides's cantata *Ἕμνος και Θρήνος για την Κύπρο* [Hymn and Lament for Cyprus] for baritone or mezzo-soprano, mixed chorus and orchestra or piano, based on lyrics by Yiannis Ritsos (1975), see Georgia Petroudi, "The 1974 Morning: *Hymn and Lament for Cyprus*," in *Between Nostalgia, Utopia, and Realities: The Tenth International Conference of the Department of Musicology, Faculty of Music, University of Arts in Belgrade, 14-17 April 2010*, ed. Tatjana Markovic (Belgrade: University of Arts, 2012), 252-62.
- 22 Solon Michaelides, *Cypriot Folk Music* (Nicosia: self-pub., 1944); Solon Michaelides, *The Neo-Hellenic Folk Music* (Nicosia: self-pub., 1948); Solon Michaelides, "Greek Folk Music: Its Preservation and Traditional Practice," *Journal of the International Folk Music Council* 1 (1949): 21-24; Solon Michaelides, "Regional Committees for the Comparative Study of Folk Music," *Journal of the International Folk Music Council* 2 (1950): 28-32; Solon Michaelides, "Greek Song-Dance," *Journal of the International Folk Music Council* 8 (1956): 37-39; Solon Michaelides, "The Neohellenic Folk Music: An Introduction to Its Character," in *Volksmusik Südeuropas: Beiträge zur Volkskunde und Musikwissenschaft anlässlich der 1. Balkanologentagung in Graz 1964—Rudolf Vogel zum 60. Geburtstag*, ed. Walther Wünsch (Munich: Trofenik, 1966), 153-64; Solon Michaelides, *Modern Greek Music* (Nicosia: self-pub., 1952); Solon Michaelides, *Modern English Music* (Nicosia: self-pub., 1939); Solon Michaelides, *Finnish Music* (Nicosia: self-pub., 1940); Solon Michaelides, *Αρμονία της Σύγχρονης Μουσικής* [Harmony of Contemporary Music]. 2 vols. Limassol: self-pub., 1945).

fugue and harmony at the State Conservatory of Thessalonica, whose directorship he assumed in 1956 at the invitation of the Greek Ministry of Education, Michaelides was exceptionally well poised to realize the enormous undertaking of the encyclopedia on Greek music. In fact, in his preoccupation with pedagogy, Michaelides followed the venerable path of Plato (ca. 429 B.C.E. – 347 B.C.E.) and Aristotle (384–322 B.C.E.), both of whom extolled the discipline of music as an ideal springboard for explorations in pedagogy, thereby tracing both the continuity and the change within the unfolding of the Greek musical tradition.²³ As conductor and general director of the *Symphony Orchestra of Northern Greece* (1959–1970), which from 1969 onward was known as the *Thessalonica State Orchestra*, he gained a profound insight into a broad range of repertory. His practical experience as composer and conductor, as pedagogue and author, informed his presentations as both guest lecturer at a number of American universities, including Yale University (New Haven, Connecticut) and guest presenter at international music conferences across Europe and North America, including Canada (Québec) and the United States of America (New York)²⁴ — scholarly activities which informed his writing in general and the completion of his encyclopedia on ancient Greek music.

The Greek *systema teleion*: The Focus in Solon Michaelides's The Music of Ancient Greece: An Encyclopaedia

In the preface to *The Music of Ancient Greece: An Encyclopaedia*, Michaelides outlines the primary as well as the secondary objectives when he states that "this encyclopaedia is principally addressed to students of ancient Greek music; it is hoped however that it may be useful as a book of reference to those incidentally interested in the matter."²⁵ In his foreword to Michaelides's encyclopedia, Reginald P. Winnington-Ingram (1904–1993), an experienced writer on Greek music,²⁶ remarks that "there are few who will not find the exploration of this encyclopaedia a fascinating and rewarding pursuit."²⁷ As a scholar deeply committed to the discipline of musicology, the history of music theory and music pedagogy, Michaelides has prepared a volume which is exemplary in its broad coverage of multiple topics, including musical terminology,²⁸ music theory,²⁹ musical

23 Anton Friedrich Walter, "Die ethisch-pädagogische Würdigung der Musik durch Plato und Aristoteles," *Vierteljahrsschrift für Musikwissenschaft* 6 (1890): 388–415; Roderick Beaton, "Modes and Roads: Factors of Change and Continuity in Greek Musical Tradition," *Annual of the British School at Athens* 75 (1980): 1–11.

24 For further details see the website of the Solon Michaelides Cultural Foundation.

25 Michaelides, *The Music of Ancient Greece*, vii.

26 See, for example, Reginald P. Winnington-Ingram, *Mode in Ancient Greek Music* (Cambridge: Cambridge University Press, 1936; repr. Amsterdam: Hakkert, 1968); see also Reginald P. Winnington-Ingram, "Ancient Greek Music: A Bibliography, 1932–1957," *Lustrum* 3 (1958): 5–57.

27 Reginald P. Winnington Ingram, Introduction to Michaelides, *The Music of Ancient Greece*, v.

28 For example, on the discussion of arsis-thesis, see Michaelides, *The Music of Ancient Greece*, 35. Michaelides's thorough approach to terminology is emulated in later studies; see, for example, Otto Steinmayer, "A Glossary of Terms Referring to Music in Greek Literature Before 400 B.C." (PhD diss., Yale University, 1986). For a consideration of music terminology prior to Michaelides, see Ingemar Düring, "Studies in Musical Terminology in 5th-Century Literature," *Eranos* 43 (1945): 176–97.

29 For example, on the *diesis*, a term with multiple meanings, see Michaelides, *The Music of Ancient Greece*, 81–82: "diesis according to the school of Aristoxenus is the quarter-tone, while the Pythagoreans called *diesis* the semitone, 1/2 of a tone."

instruments,³⁰ and components thereof,³¹ dance,³² metrics,³³ poetry,³⁴ types of song,³⁵ as well as theorists,³⁶ composers,³⁷ poets,³⁸ performers,³⁹ and philosophers⁴⁰ intimately connected to this discipline, in addition to an identification of extant melodies of ancient Greek music, transmitted primarily as fragments in both original sources and modern transcriptions—under the entry “Remains of Greek Music.”⁴¹ The subtitle of this volume clarifies the undertaking at hand and as such sets this publication in bold relief to the publications of the pre-1980s.⁴² Michaelides steers clear of a volume on ancient Greek music anchored in the continuous narrative of historiography, by presenting an encyclopedia of over 1100 entries focussed on technical terms and proper names, all with recourse to a consistent format. For each entry Michaelides, with recourse to the Roman alphabet, provides an English transliteration of the Greek term, followed by the Greek characters, and for the majority of entries the modern Greek pronunciation in an English phonetic version—in essence underscoring the genuinely bilingual nature of the publication, a decision which is commensurate with the principal audience of the book.

One of the most complex topics in the contemplation of the music of ancient Greece is the *systema teleion*, often referred to by a number of related terms, such as the Greater Perfect System, the Immutable System, and the Double Octave System, all with the same meaning, or simply by the term “systema,” the latter by which Michaelides provides access to this broad topic in his encyclopedia.⁴³ In fact, of particular interest for the reflection upon ancient Greek music theory and the significance of this area of study in the broader quest concerning the origin of music, focussed on the retrieval of ancient knowledge, is the Greek *systema teleion*, with its complex terminology and the mapping of this system onto Pythagorean arithmetic.⁴⁴ The latter facet of the Greek *systema teleion* is readily seen in a number of terms with multiple meanings, such as the *harmoniai* (embracing the concept of *diapason*, *genos*, *intervallum*, *melodia*, *musica*, *systema teleion*, *tropos*),⁴⁵

30 For example, on the *aulos*, see *ibid.*, 42-46.

31 For example, on the *bombyx*, see *ibid.*, 52-53: “(a) the whole pipe, the principal body of the aulos; (b) in plural Bombykes were called ‘collars’ (or wide rings) that had corresponding holes and could be turned to cover or uncover the pipe holes.”

32 For example, on *eklakisma*, see *ibid.*, 92: “a kind of feminine dance in which the woman dancers had to kick the feet high up and over the shoulder”; see also Lillian B. Lawler, *The Dance in Ancient Greece* (London: Adam & Charles Black, 1964).

33 For example, on the *metrike*, see Michaelides, *The Music of Ancient Greece*, 207; see also *metron* (measure), 207-208.

34 For example, on the *poesis*, see *ibid.*, 262-63: “the word had a wide scope of significations in the ancient Greek language. It was used to mean, especially in old times, the creation of construction of almost everything [...] all works made under the guidance of arts are creations (poeseis) and their creators are *poetai*.”

35 For example, on the *dithyrambos*, see *ibid.*, 85-86: “a lyric song of an enthusiastic character sung in honour of Dionysius.”

36 For example on Aristoxenos, see *ibid.*, 33-35.

37 For example, on Argas, see *ibid.*, 28-29: “4th century B.C. Athenian poet and kitharode of the time of Philip and Alexander the Great.”

38 For example, on Stratonicus, see *ibid.*, 305.

39 For example, on Olympus, see *ibid.*, 225-26: “(1) Mythico-historical musician from Phryia, pupil of Marysas [...]; (2) second Olymus, the younger, from Mysia in Asia Minor [...].”

40 For example, on the Pythagorean philosopher Archytas, see *ibid.*, 27-28.

41 *Ibid.*, 285-90.

42 For an overview of the pre-1980 publications, see Mathiesen, *Apollo's Lyre*, 669-783.

43 Michaelides, *The Music of Ancient Greece*, 316-20.

44 Charles M. Atkinson, *The Critical Nexus: Tone-System, Mode, and Notation in Early Medieval Music* (Oxford: Oxford University Press, 2009).

45 Michaelides, *The Music of Ancient Greece*, 127-29 (on *harmonia*), 129-30 (on *harmonia* of the spheres); see also Thomas J. Mathiesen, “Problems of Terminology in Ancient Greek Theory: APMONIA,” in *Festival Essays for Pauline*

all of which Michaelides sets distinctly apart from one another, with each definition fully supported by the identification of *loci paralleli* within the *elementa musicae*, functioning as the basis for the music-theoretical discourse of the Middle Ages.⁴⁶ On occasion, a number of related terms are juxtaposed within a single entry, such as *paraphonia*, meaning concord "when two dissimilar sounds played [at once] present no difference between themselves,"⁴⁷ *paraphonoi*, meaning "those [sounds] between concord and discord; when struck they give the impression of being concordant, as in the case of three tones from *parhyypate meson* (f) to *paramese* (b) and in the case of two tones from *lichanos* (*diatonos*) *meson* (g) to *paramese* (b)"⁴⁸ and the use of the term *paraphonoi* in Longinus in the sense of 'sweetening the *kyrios* (*principal*) *phtongos*."⁴⁹ Perhaps inspired by Michaelides, though he is not specifically mentioned, this particular constellation of terminology has received attention in more recent scholarship. With regard to the notion of the *paraphonia*, Rudolf Flotzinger (born 1939) draws attention to the conflicting use of this term. Gaudentius (third or fourth century C.E.) resorts to this term with reference to the interval of the ditonus and tritonus placed between consonance and dissonance, whereas Theon of Smyrna (flourished 115-140 C.E.) and Michael Psellus (1018- ca. 1078) use this term to denote the consonances of the *diapente* and *diatessaron*.⁵⁰

The term *systema teleion*, embracing the double octave and the various subdivisions of the gamut into tetrachord (*tetrachordon*),⁵¹ pentachord (*pentachordon*),⁵² hexachord (*hexachordon*),⁵³ heptachord (*heptachordos*),⁵⁴ octachord (*octachordon*),⁵⁵ and endecachord (*hendekakroumatis*),⁵⁶ is not accorded any entry in Michaelides's encyclopedia. Rather Michaelides distributes the information pertinent to the broad and in-depth understanding across several entries, such as the "systema," "harmoniai" and "tonos"⁵⁷ as well as the nomenclature of the individual notes within the double octave,⁵⁸ and that in order to allow the reader multiple access points. While Michaelides for the majority of the entries favours brevity over long-winded prose, a number of entries receive a more

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- Alderman: A Musicological Tribute*, ed. Burton L. Karson et al. (Provo, UT: Brigham Young University Press, 1976), 3-17; Thomas J. Mathiesen, "Harmonia and Ethos in Ancient Greek Music," *The Journal of Musicology* 3 (1984): 264-79; Andrew Barker, *The Science of Harmonics in Classical Greece* (Cambridge: Cambridge University Press, 2007).
- 46 Klaus-Jürgen Sachs, "Musikalische Elementarlehre im Mittelalter," in *Rezeption des antiken Fachs im Mittelalter*, ed. Frieder Zaminer (Darmstadt: Wissenschaftliche Buchgesellschaft, 1990), 106-61.
- 47 Bacchius, *Isagogue artis musicae*, Paragraph 61; see Carl von Jan, *Musici scriptores graeci* (Leipzig: B. G. Teubner, 1895), 305; as cited in Michaelides, *The Music of Ancient Greece*, 238; see also Walter Kurt Kreyszig, "Franchino Gaffurio und seine Übersetzer der griechischen Musiktheorie in der *Theorica musica* (1492): Ermolao Barbaro, Giovanni Francesco Burana und Marsilio Ficino," in *Musik als Text: Bericht über den Internationalen Kongress der Gesellschaft für Musikforschung, Freiburg im Breisgau 1993*, 2 vols., ed. Hermann Danuser and Tobias Plebuch (Kassel: Bärenreiter, 1998), 1: 164-71, especially 168.
- 48 Bacchius, *Isagogue* 8; see Carl von Jan, [*Musici scriptores graeci* (Leipzig: B. G. Teubner, 1895)], 338; as cited in Michaelides, *The Music of Ancient Greece*, 238.
- 49 Longinus 28.1; as cited in Michaelides, *The Music of Ancient Greece*, 238.
- 50 Rudolf Flotzinger, "Die Paraphonista oder: Klangprinzip und Organum," in *Max Liitolf zum 60. Geburtstag: Festschrift*, ed. Bernhard Hangartner and Urs Fischer (Basel: Wiese, 1994), 99-111, especially 101.
- 51 Michaelides, *The Music of Ancient Greece*, 328-29; Mathiesen, *Apollo's Lyre*, 244; Charles André Barbera, "Arithmetic and Geometric Divisions of the Tetrachord," *Journal of Music Theory* 21 (1977): 294-323.
- 52 Michaelides, *The Music of Ancient Greece*, 245; Mathiesen, *Apollo's Lyre*, 357.
- 53 Michaelides, *The Music of Ancient Greece*, 138; Jacques Chailley, "L'Hexatonique grec d'après Nicomaque," *Revue des études grecques* 69 (1956): 73-100.
- 54 Michaelides, *The Music of Ancient Greece*, 133-34; Mathiesen, *Apollo's Lyre*, 244-46.
- 55 Michaelides, *The Music of Ancient Greece*, 223; Mathiesen, *Apollo's Lyre*, 245-46, 398-99, 402.
- 56 Michaelides, *The Music of Ancient Greece*, 134; Charles André Barbera, "The Consonant Eleventh and the Expansion of the Musical Tetractys: A Study of Ancient Pythagoreanism," *Journal of Music Theory* 28 (1984): 191-223.
- 57 Michaelides, *The Music of Ancient Greece*, 316-20, 127-29, 335-40, respectively.
- 58 On the *onomasia* or *onomatobesia* within the *systema teleion*, see *ibid.*, 226-28. For example, on the discussion of the *mesē*, see *ibid.*, 203-4.

detailed coverage, as for example the entries on the "mousike,"⁵⁹ "aulos"⁶⁰ and "ethos,"⁶¹ with the latter two entries attesting to Michaelides's own background as instrumentalist and pedagogue. The entry on "ethos" illustrates Michaelides's meticulous preparation of the text, as he begins with a generic definition, that is, "in a general sense, principally the moral character of a person," prior to the application of this same term to a number of other specific contexts, such as "ethos of notes and pitch," "ethos of melos" (i.e. of *melopoeia*), "ethos of harmoniai" (i.e. of the *tonoi*), "ethos of genera," that is tetrachordal *genera*, such as diatonic, chromatic, enharmonic; and "ethos of rhythms," that is, in the context of the *thesis* or *arsis* as the basis for the coordination of the rhythm.⁶² For each category mentioned, Michaelides relies on the Greek authors, here foremost on the *De musica* of Aristides Quintilianus (flourished late third – mid-fourth centuries C.E.),⁶³ and to a lesser degree on the *Isagogue or Introduction to Harmonics* of Cleonides (second or third century C.E.),⁶⁴ on the *De musica* of Plutarch of Chaeronea (flourished ca. 50- ca. 120 C.E.)⁶⁵ and on the Bellermann Anonymi.⁶⁶ In the preparation of the entry on "mousike," Michaelides is guided by the chronology of the sources, from which he adopts the definition, beginning with the Poem Olympian I of Pindar (522-518 B.C.E. – 442-436 B.C.E.), the Hymn of Pindar⁶⁷, the *Historiae* of Herodotus (485-425 B.C.E.), and the *Historiae* of Thucydides (ca. 460 – ca. 400 B.C.E.),⁶⁸ and then turning to the branches of music education,⁶⁹ here relying on the *De musica* of Aristides Quintilianus, the Bellermann Anonymi, the *De musica* of Plutarch, and the *Harmonica* of Aristoxenos of Tarent (375/360 B.C.E.- after 320 B.C.E.). For each of the lengthier entries Michaelides provides a detailed bibliography of secondary sources.

Hitherto, Michaelides is the first and only scholar to offer a truly encyclopedic coverage of ancient Greek music—a coverage which on the one hand elegantly paves the way for a number of scholarly endeavours beginning in the 1980s, including the two-volume compilation by Andrew Barker, and the individual contributions of Martin L. West, Warren D. Anderson, Thomas J. Mathiesen, Andrew Barker and Stefan Hagel⁷⁰—and on the other hand provides the solid basis for

59 Ibid., 213-16.

60 Ibid.

61 Ibid., 110-13; see also Warren DeWitt Anderson, "Paideia and Ethos in Hellenic Music, with Special Reference to Literary Evidence Regarding the Modes" (PhD diss., Harvard University, 1954).

62 Michaelides, *The Music of Ancient Greece*, 110-13; see also Martin Vogel, *Die Enharmonik der Griechen*, 2 vols. (Düsseldorf: Verlag der Gesellschaft zur Förderung der Systematischen Musikwissenschaft, 1963); Thrasybulos Georgiades, *Musik und Rhythmus bei den Griechen: Zum Ursprung der abendländischen Musik* (Reinbek bei Hamburg: Rowohlt, 1958).

63 Giovanni Francesco Burana, trans., *Aristides Quintilianus: Musica e graeco in latinum conversa*, 15 April 1494, Verona, Biblioteca Capitolare, MS CCXL (201), 1r–25v.

64 Giorgio Valla, trans., *Cleonides: Harmonicum introductorium* (Venice: Simon Papiens dictus Bevilacqua, 1497).

65 "Musica," in *Plutarchi Caeronei, philosophi, historicique clarissimi opuscula (quae quidem extant) omnia* (Basel: In Officina and. Cratandri, Mense Septembri, 1530), 25v–32v; see also Angelo Meriani, *Sulla musica greca antica: Studi e ricerche* (Naples: Alfredo Guida, 2003), especially 49-82.

66 Dietmar Najock, *Drei anonyme griechische Traktate über die Musik: Eine kommentierte Neuausgabe des Bellermannschen Anonymus* (Göttingen: Hubert & Company, 1972).

67 Ian Rutherford, *Pindar's Paens: A Reading of the Fragments with a Survey of the Genre* (Oxford: Oxford University Press, 2001).

68 Lorenzo Valla, trans., *Thucydides: Historia belli Peloponnesiaci* (Treviso: Johannes Rubeus Verzellensis, 1483).

69 Warren DeWitt Anderson, *Ethos and Education in Greek Music: The Evidence of Poetry and Philosophy* (Cambridge, MA: Harvard University Press, 1966).

70 Andrew Barker, ed., *Greek Musical Writings*, 2 vols. (Cambridge: Cambridge University Press, 1984-1998); Martin L. West, *Ancient Greek Music* (Oxford: Clarendon Press, 1992); Warren DeWitt Anderson, *Music and Musicians in Ancient Greece* (Ithaca, NY: Cornell University Press, 1994); Thomas J. Mathiesen, "Greek Music Theory," in *The Cambridge History of Western Music Theory*, ed. Thomas Christensen (Cambridge: Cambridge University Press, 2002), 109-135;

the examination and dissemination of the *systema teleion* during the era of musical humanism, 1400-1600, and beyond.

Review and Reception of Solon Michaelides's *The Music of Ancient Greece: An Encyclopaedia*

Within a few months of its publication, the *Encyclopaedia of Ancient Greek Music* by Michaelides received considerable attention in reviews, all of which appeared in a wide range of journals between 1978 and 1980.⁷¹ While a detailed analysis of these reviews lies outside the scope of the present contribution, three issues raised in these reviews warrant comment, as they clearly speak to the misunderstood objective of this scholarly undertaking. Douglas D. Feaver bemoans the absence of "general articles on such topics as 'music in drama,' 'music in poetry,' 'melody and word accent,' and 'history of music in Greece'"—topics that obviously would drastically change the current emphasis from the encyclopedia to a volume more intrinsically focussed on a history of ancient Greek music with a continuous narrative, broken into individual chapters, each with one of the topics suggested in this review. M. Owen Lee levies his criticism of Michaelides's contribution at an overly narrow approach, with regard to the unwarranted exclusions of major figures in Greek music, including "Homer, Hesiod, Hipposus [of Metapont], Democritus, Philodemus, Theocritus, Anonymus Bellermani, Sextus Empiricus, Pausanias, Vitruvius, Martianus Capella, Saint Augustine, Priscian, Boethius and Cassiodorus"—a compilation of Greek and Latin authors. In this single-volume encyclopedia, Michaelides was obviously faced with some difficult decisions regarding single entries on some of the principal forces behind ancient Greek music. While all of the Greek contributors identified above undoubtedly play important roles in the shaping of ancient Greek music and in the related secondary literature, their names generally do not surface in the discussion of ancient Greek music introductory music history texts, and thus the English-speaking student would in all likelihood not come into contact with the aforementioned Greek authors. With regard to the Latin treatises, beginning with the *De architectura* of Marcus Vitruvius (1st century B.C.E.)⁷² and ending with the *Variae* and the *Institutiones humanarum litterarum*, both of Flavius Magnus Aurelius Cassiodorus (ca. 485-580), the exclusion of their contributions from the encyclopedia in single articles is even more obvious, as Michaelides limits his individual entries exclusively to important ideas that have been developed on Greek soil by Greek scholars, with the inclusion of some Byzantine scholarship, especially when such endeavours prove significant in the promotion of ancient Greek music. Any contribution to ancient Greek music by Latin scholars, including the principal reviewer of the Greek tradition, Anicius Manlius Severinus Boethius (ca. 480 – ca. 524),⁷³ who is generally acknowledged as the "auctoritas," as the most reliable spokesperson on the reception of ancient Greek music and music theory, does not surface in this encyclopedia, so that the student of ancient Greek music is required to consult other reference works that embrace more directly and more fully the Latin tradition, such as *Pauly's Realencyklopädie der Klassischen Altertumswissenschaften*, a multi-volume encyclopedia more broadly focussed on culture

Andrew Barker, *Scientific Method in Ptolemy's Harmonics*, 2nd. ed. (New York: Cambridge University Press, 2006); Stefan Hagel, *Ancient Greek Music: A New Technical History* (Cambridge: Cambridge University Press, 2010).

71 Solon Michaelides's *The Music of Ancient Greece* has been subject of reviews by Geoffrey Chew in *Early Music* 6 (1978): 595-97; Anthony Baines in *Galpin Society Journal* 32 (1979): 145-46; John G. Landels in *The Classical Review*, New Series 29 (1979): 131-32; M. Owen Lee in *Phoenix* 33 (1979): 362-67; Douglas D. Feaver in *The American Journal of Philology* 101 (1980): 231-34; P.M. Megas and P. Marie in *Social Science* 55 (1980): 60; Jon Solomon in *The Classical Journal* 75 (1989): 356-57; and David Wulstan in *Music and Letters* 61 (1980): 88-89.

72 Frank Granger, ed. and trans., *Vitruvius: On Architecture*, 2 vols. (London: W. Heinemann; New York: Putnam, 1931-1934).

73 On Boethius's seminal position as an *auctoritas* on both Greek and Latin systems of music, see Claude V. Palisca, "Boethius in the Renaissance," in *Music Theory and Its Sources: Antiquity and the Middle Ages*, ed. Charles André Barbera (Notre Dame, IN: University of Notre Dame Press, 1990), 259-80; also in Claude V. Palisca, *Studies in the History of Italian Music and Music Theory* (Oxford: Clarendon Press, 1994), 168-88.

from the Greek, Byzantine, and Latin orbits.⁷⁴ Finally, Geoffrey Chew remark that "Michaelides's book is hardly aimed at the readership of *Early Music*," suggests a less than sympathetic view on the encyclopedia, as the reviewer has failed to acknowledge the true merits of Michaelides's heroic undertaking.

The latter criticism leads us to a reconsideration of the principal audience of the volume, the students of ancient Greek music, though without identifying their level of experience with the subject matter or with music as a whole. Judging from the aforementioned aim of this volume, as articulated by Michaelides himself, the author in his assemblage of the pertinent materials and the completion of the draft of the encyclopedia, was likely thinking of university students, either at the undergraduate level or the graduate level, unfamiliar with the topic of ancient Greek music, so that this volume would serve as a complement to the instructional materials used in the delivery of classes, specifically textbooks as well as other readings from the vast secondary literature, such as scholarly papers and monographs, with an overview provided in Mathiesen's *Apollo's Lyre*⁷⁵. Here significant differences exist in the academic instruction in music offered in European and North American institutions, which arise already from the student's general preparedness in foreign languages. While European students may rely on languages other than their mother tongue, many North American students do not read outside their native language — a factor that was at the forefront of Michaelides's thoughts in the preparation of the encyclopedia. And in the inquiry into the field of ancient Greek music, where foreign languages, especially Latin, French, German, and Italian, play a decisive role in the disclosing of information, as readily gathered from the secondary literature, the general preparedness of students, including their language skills, plays a most decisive role in the development of the curriculum and the tailoring thereof to their needs, so as to assure a successful delivery of the course content, let alone of the segment on ancient Greek music.

In North America, the textbook market is saturated with a wide array of volumes, all of which include one or several chapters on ancient Greek music. The volumes range from texts especially suited for introductory music history surveys⁷⁶ to period surveys of the Antiquity and the Middle Ages suited for use in more advanced music history surveys,⁷⁷ and finally a number of highly specialized volumes,⁷⁸ an in-depth examination of music in a broad social context, a survey of the discipline of music during the period of musical humanism, based on the study of largely manuscript sources and early printed volumes, with a more integrated approach to the study of the

74 Konrat Ziegler, ed., *Pauly's Realencyklopädie der Klassischen Altertumswissenschaft*, 68 vols., 15 supplements and 1 register (Stuttgart: Metzler, 1894-1980; Munich: Druckenmüller, 1956-1991).

75 Mathiesen, *Apollo's Lyre*; see also Mathiesen, "Greek Music Theory."

76 Charlotte Roederer, "Medieval Music: The Historical Background and Cultural Sources," in *Schirmer History of Music*, ed. Leonie Rosenstiel (New York: Schirmer; London: Macmillan, 1982), 6-13; Barbaro Russano Hanning, *Concise History of Western Music* (New York: W.W. Norton, 1998), 1-12; K. Marie Stolba, *The Development of Western Music* (Boston: McGraw Hill, 1998), 8-17; Mark Evan Bonds, *History of Music in Western Culture* (Upper Saddle River, NJ: Prentice Hall, 2006), 4-11; Douglas Seaton, *Ideas and Styles in the Western Musical Tradition* (Oxford: Oxford University Press, 2010), 1-8; Craig Wright and Bryan Simms, *Music in Western Civilization* (Boston: Cengage, 2010), 4-14; Richard Taruskin and Christopher H. Gibbs, *The Oxford History of Western Music*, college ed. (New York: Oxford University Press, 2013), 1-6; L. Peter Burkholder, Donald Jay Grout, and Claude V. Palisca, *A History of Western Music*, 9th ed. (New York; W.W. Norton, 2014), 4-19.

77 Curt Sachs, *The Rise of Music in the Ancient World, East and West* (New York: W.W. Norton, 1941), 198-311; Gustav Reese, *Music in the Middle Ages, with an Introduction on Music of Ancient Times* (New York: W.W. Norton, 1963), 11-53; Isobel Henderson and David Wulstan, "Introduction: Ancient Greece," in *Music from the Middle Ages to the Renaissance*, ed. Frederick W. Sternfeld (New York: Praeger, 1971), 1-58; Albert Seay, *Music in the Medieval World* (Englewood Cliffs, NJ: Prentice Hall, 1973), 15-22; Jeremy Yudkin, *Music in Medieval Europe* (Englewood Cliffs, NJ: Prentice Hall, 1989), 19-27; Andrew Barker, "Public Music as 'Fine Art' in Archaic Greece," in *Antiquity and the Middle Ages: From Ancient Greece to the 15th Century*, ed. James McKinnon (Englewood Cliffs, NJ: Prentice Hall, 1990), 45-67.

78 Paul Henry Lang, *Music in Western Civilization* (New York: W.W. Norton, 1941), 1-20.

history of music theory from the Greek, Byzantine and Latin orbits,⁷⁹ a similar approach geared towards the students enrolled in the field of Classical, Medieval and Renaissance studies, with less experience with the field of music,⁸⁰ and finally a volume with a focus on a series of primary documents serving as the basis for historiography.⁸¹ For each of these volumes, Michaelides's encyclopedia of ancient Greek music may indeed serve the students as an additional source of reference in familiarizing themselves with a challenging and complex topic. An illustration concerning the manner in which this suggestion may be put into practice is provided in the closer examination of the three-page introduction to "Greek Music Theory," focused on the comprehensive disclosure of the *systema teleion*, with the systems of melodic modes and of rhythms accounted.⁸² The excerpt from this textbook has been enlarged by a number of references to Michaelides's encyclopedia, with entries that may serve as convenient points of access into the encyclopedia, thus allowing the students to clarify issues of terminology as a means of deepening their overall understanding of the lectures and relevant readings.

No writings by Pythagoras survive,⁸³ and those of his followers exist only in fragments quoted by later authors. The earliest theoretical works we have are *Harmonic Elements* and *Rhythmic Elements* (ca. 330 B.C.E.) by Aristoxenus,⁸⁴ pupil of Aristotle.⁸⁵ Important later writers include Cleonides (ca. second or third century C.E.),⁸⁶ Ptolemy,⁸⁷ and Aristides Quintilianus.⁸⁸ These theorists defined concepts still used today, as well as ones specific to ancient Greek music. Their writings show how much the Greeks valued abstract thought, logic, and systematic definition and classification, an approach that has influenced all later writing on music [...].

In *Harmonic Elements*, Aristoxenus distinguishes between *continuous* movement of the voice, gliding up and down as in speech, and *diastematic* (or *intervalllic*) movement,⁸⁹ in which the voice moves between sustained pitches separated by discrete intervals.⁹⁰ A melody consists of a series of *notes*, each on a single pitch;⁹¹ an *interval* is formed between two notes of different pitch;⁹² and a

79 Palisca, *Humanism* [with references to Greek Music and Music Theory throughout this volume].

80 Gloria K. Fiero, *The Humanistic Tradition: The First Civilizations and the Classical Legacy* (Boston: McGraw Hill, 2006), 76–112.

81 Pierro Weiss and Richard Taruskin, eds., *Music in the Western World: A History in Documents* (Belmont, CA: Thomson; New York: Schirmer, 2008), 1–12.

82 Burkholder, Palisca, and Grout, *History of Western Music*, 15-17. Here, only the passages in reference to the Greek melodic modes are reproduced. The text in bold and italics is presented as in the original. The examples accompanying the text are not reproduced.

83 [Kreyszig's footnote]: Michaelides, "Pythagoras," in Michaelides, *The Music of Ancient Greece*, 282-83.

84 [Kreyszig's footnote]: Michaelides, "Aristoxenus," in *ibid.*, 33-35.

85 [Kreyszig's footnote]: Michaelides, "Aristotle," in *ibid.*, 31-33.

86 [Kreyszig's footnote]: Michaelides, "Cleonides," in *ibid.*, 67-68.

87 [Kreyszig's footnote]: Michaelides, "Ptolemaeus," in *ibid.*, 278-79.

88 [Kreyszig's footnote]: Michaelides, "Aristides Quintilianus," in *ibid.*, 29-30.

89 [Kreyszig's footnote]: Michaelides, "Aristoxenus," in *ibid.*, 33-34.

90 [Kreyszig's footnote]: Michaelides, "diastema," in *ibid.*, 77-78; see also Albrecht Riethmüller, "Logos und Diastema in der griechischen Musiktheorie," *Archiv für Musikwissenschaft* 42 (1985): 18-36.

91 [Kreyszig's footnote]: Michaelides, "tonos," in Michaelides, *The Music of Ancient Greece*, 335-40.

92 [Kreyszig's footnote]: *Ibid.*

scale is a series of three or more different pitches in ascending or descending order. [...]⁹³

Unique to the Greek system were the concepts of **tetrachord**⁹⁴ and **genus** (pl. *genera*).⁹⁵ A tetrachord (literally, "four strings") comprised four notes spanning a perfect fourth. There were three genera (classes) of tetrachord, shown in Example 1.1: **diatonic**,⁹⁶ **chromatic**,⁹⁷ and **enharmonic**.⁹⁸ The outer notes of the tetrachord were considered stationary in pitch, while the inner two notes could move to form different intervals within the tetrachord and create the different genera. Normally the smallest intervals were at the bottom, the largest at the top. The diatonic tetrachord included two whole tones and a semitone. In the chromatic, the top interval was a tone and a half (equal to a minor third) and the others semitones. In the enharmonic, the top interval was the size of two tones (equal to a major third) and the lower ones approximately quarter tones.⁹⁹ All these intervals could vary slightly in size, giving rise to "shades" within each genus. [...]

Since most melodies exceeded a fourth, theorists combined tetrachords to cover a larger range. Two successive tetrachords were **conjunct** if they shared a note, as do the first two tetrachords [...] or **disjunct** if they were separated by a whole tone, as are the second and third tetrachords. The system shown in the example, with four tetrachords plus an added lowest note to complete a two-octave span, was called the **Greater Perfect System**.¹⁰⁰ The outer, fixed tones of each tetrachord are shown in open notes, the movable inner tones in black notes.

Each note and tetrachord had a name to indicate its place in the system. [...] the middle note was called "mese" (middle)¹⁰¹ [...]

Cleonides noted that in the diatonic genus the three main consonances of perfect fourth, fifth, and octave were subdivided into tones (T) and semitones (S) in only a limited number of ways, which he called **species**.¹⁰²

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93 [Kreyszig's footnote]: Ibid.

94 [Kreyszig's footnote]: Michaelides, "tetrachordon," in *ibid.*, 328.

95 [Kreyszig's footnote]: Michaelides, "genus, genos," in *ibid.*, 121-22.

96 [Kreyszig's footnote]: Michaelides, "Diatonon genos," in *ibid.*, 79.

97 [Kreyszig's footnote]: Michaelides, "Chromatikon genos," in *ibid.*, 65-67.

98 [Kreyszig's footnote]: Michaelides, "Enharmonion genos," in *ibid.*, 100-101; see also Vogel, *Die Enharmonik der Griechen*.

99 [Kreyszig's footnote]. Further on this topic, see Lotte Kallenbach-Greller, "Die historischen Grundlagen der Vierteltöne," *Archiv für Musikwissenschaft* 8 (1926): 473-85.

100 [Kreyszig's footnote]: Michaelides, "systema," in Michaelides, *The Music of Ancient Greece*, 316-20; see also John Curtis, "Reconstruction of the Greater Perfect System," *Journal of Hellenic Studies* 44 (1924): 10-23.

101 [Kreyszig's footnote]: Michaelides, "mese," in Michaelides, *The Music of Ancient Greece*, 203-204.

102 [Kreyszig's footnote]: Michaelides, "harmoniai," in *ibid.*, 127-29.

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The coordination of the chosen passage from the textbook with specific points of entry into Michaelides's encyclopedia is perhaps not as self-evident, as it might appear on the surface, especially with regard to issues of terminology. For Michaelides uses English transliterations of his terminology as a point of entry into the encyclopedia, whereas in the textbook there is an exclusive reliance on English terminology. This unavoidable discrepancy between the encyclopedia and the textbook has already been voiced by Douglas D. Feaver, one of the reviewers of Michaelides's encyclopedia. The issue of compatibility between the two secondary sources will be enhanced as a result of the involvement of the instructor familiar with both the textbook and the encyclopedia. The intervention of the instructor as the mediating voice between the textbook and the encyclopedia assures the appropriate applicability of the latter source of reference — a fact which substantiates the noble endeavour of Michaelides and in the end enhance the suitability of his publication.

The systema teleion vis-à-vis the Guidonian System

The examination of the Greek *systema teleion* is a rather complex topic, as seen from the discussion of this central facet of Greek music theory and its reception through the ages. Already in the era of pre-humanism, such a discussion has on occasion given rise to considerable confusion of the Greek system of the *tonoi* and the Latin system of the Western *modi*, the latter also known as the Guidonian modes, with both of these scalar systems associated with the same nomenclature of the respective eight modes, that is, *Dorian*, *Hypodorian*, *Phrygian*, *Hypophrygian*, *Lydian*, *Hypolydian*, *Mixolydian*, and *Hypomixolydian*, yet with considerable differences in total interval content of each mode in the respective system, as is readily gathered from even a most cursory inspection of the succession of half and whole steps within the Greek and Latin systems.¹⁰³

Already Vitruvius (in his *De architectura* 5.3) had remarked that "harmonics [i.e. the *systema teleion*] is an obscure and difficult subject to read and write about, particularly for those who do not know Greek letters." The aforementioned Gaffurio, one of the principal humanists,¹⁰⁴ reflected on Vitruvius's comment, though without giving credit to Vitruvius's *De architectura*, in his own *Theorica musica* (1492), where he states that "it is true that prior to this arrangement of the letters [i.e. in reference to the Guidonian modes], scribes indicated the steps by certain very difficult

103 For a schematic illustration of the eight *tonoi* of the Greek *systema teleion*, see Claude V. Palisca, "Theory, theorists," in *The New Grove Dictionary of Music and Musicians*, 2nd ed., ed. Stanley Sadie and John Tyrrell (London: Macmillan, 2001), 25: 359-76, especially 362. For a schematic illustration of the Guidonian system of eight modes, see Richard H. Hoppin, *Medieval Music* (New York: W.W. Norton, 1978), 65; Charles M. Atkinson, "Fifteen Modes Versus Eight: On the Background of a Medieval and Renaissance Theoretical Conflict," in *Musik des Mittelalters und der Renaissance: Festschrift Klaus-Jürgen Sachs zum 80. Geburtstag*, ed. Rainer Kleinertz et al. (Hildesheim: Georg Olms, 2010), 1-14.

104 Palisca, *Humanism*, 191-225. Incidentally, Gaffurio is the only humanist to whom Palisca devotes an entire chapter; see also Walter Kurt Kreyszig, "Franchino Gaffurio als Vermittler der Musiklehre des Altertums und des Mittelalters: Zur Identifizierung griechischer und lateinischer Quellen in der *Theorica musica* (1492)," *Acta Musicologica* 65 (1993): 134-50; see also Davide Daolmi, ed., *Ritratto di Gaffurio* (Lucca: Libreria Musicale Italiana, 2017).

cyphers [i.e. in reference to the Greek notational symbols]."¹⁰⁵ However, the same nomenclature applied to two different scalar systems, at least for Gaffurio, provided ample enough reason to explain the Latin system of the *modi* as a derivative of the Greek system of the *tonoi*, obviously without realizing that these two systems shared nothing in common beyond the scale as the most fundamental idea behind the respective systems.¹⁰⁶ Even Gaffurio's consultations of two other treatises in Latin translations, both by Nicolo Leoniceo (1428-1524), namely, the *De musica* of Aristides Quintilianus and the *De harmonia* of the Byzantine Manuel Bryennius (flourished ca. 1300)¹⁰⁷—treatises in which the respective authors include a detailed analysis of the *systema teleion* with a careful distinction between the *tonoi*¹⁰⁸ and the octave species¹⁰⁹—did not provide the necessary clarification of the Greek scalar system for Gaffurio's completion of his *De harmonia musicorum instrumentorum opus* (1518), a volume in which Gaffurio had made considerable progress in the clarification of the *systema teleion*, with the individual steps of the two-octave scale assigned specific numbers, though without explaining the details of the Pythagorean arithmetic.¹¹⁰ Yet, we still witness some of the same confusion of the Greek and Latin scalar system, already reported more than two decades earlier in the *Theorica musica* (1492)—with the misread Greek text and its subsequent transmission during the era of humanism serving as an example of the so-called "submerged literature," coined by Luigi Enrico Rossi.¹¹¹ The vexing issue surrounding the comparison of Greek and Latin scalar systems was laid to rest by Vincenzo Galilei (ca.1520-1591) in his *Dialogo della musica antica et della moderna* (Florence, 1581),¹¹² with his acknowledging of the Greek and Latin systems as independent of one another rather than the examination of the Latin modes providing profound insights into the emergence of the Greek *tonoi*.

The Longevity of the *Systema Teleion*: Music-Theoretical Terminology During the Renaissance and Beyond

Hitherto, little attention has been devoted to the examination of the impact of Greek music on the music of the Middle Ages and the Renaissance.¹¹³ In the early years of the eighteenth century, Pierre Jean Burette (1665-1747)—since 1705 professor of medicine of the Académie Royale, founded by Louis XIV (1638-1715) in 1663—during his tenure gradually shifted his interest

105 Gaffurio, *Theorica musica* 5.6 [11]; see also Walter Kurt Kreyszig, trans., *Franchino Gaffurio: The Theory of Music* (New Haven, CT: Yale University Press, 1993), 172.

106 Even during the latter part of the nineteenth and early twentieth centuries, the connection between the Greek and Latin melodic systems is explored in the secondary literature; see, for example, Miljenko M. Dabo-Peranić, *The Greek Harmoniai Identical With the Church Modi* (East Northport, NY: Sunrise Press, 1988).

107 G. H. Jonker, ed. and trans., *The Harmonics of Manuel Bryennius* (Groningen: Walters-Noordhoff, 1970).

108 Jon Solomon, "Towards a History of Tonoï," *The Journal of Musicology* 3 (1984): 242-51.

109 Charles André Barbera, "Octave Species," *The Journal of Musicology* 3 (1984): 229-41.

110 Herbert Kreyszig and Walter Kurt Kreyszig, "The Transmission of the Pythagorean Arithmetic in the Context of the Ancient Musical Tradition from the Greek to the Latin Orbits During the Renaissance: A Computational Approach of Identifying and Analyzing the Formation of Scales in the *De harmonia musicorum instrumentorum opus* (Milan, 1518) of Franchino Gaffurio (1451-1522)," in *Mathematics and Computation in Music: First International Conference, MCM 2007, Berlin, Germany, May 2007—Revised Selected Papers*, ed. Timour Klouche and Thomas Noll (Berlin: Springer, 2009), 389-402.

111 Luigi Enrico Rossi, "L'autore e il controllo del testo nel mondo antico," *Seminari romani di cultura greca* 3 (2000): 165-181; see also Angelo Meriani, "The Submerged Musicology of Ancient Greece," in *Submerged Literature in Ancient Greek Culture: Case Studies*, 2 vols., ed. Giulio Colesanti and Laura Lulli (Berlin: de Gruyter, 2016), 1: 325-38.

112 Claude V. Palisca, trans., *Vincenzo Galilei: Dialogue on Ancient and Modern Music* (New Haven, CT: Yale University Press, 2003).

113 Ingemar Düring, "Impact of Greek Music on Western Civilization," in *Acta Cluniana Aongressus Madvigiani: Hafniae 1954—Proceedings of the Second International Congress of Classical Studies 1954*, 5 vols., ed. Fédération internationale des associations d'études classiques (Copenhagen: E. Munksgaard, 1957-1958), 1: 169-84.

to the study of ancient music, research that was initially recognized by a number of his contemporaries, among them Friedrich Wilhelm Marpurge (1718-1795), Jean-Benjamin de la Borde (1734-1794) and Jean-Jacques Rousseau (1712-1778), but during the nineteenth century fell into oblivion.¹¹⁴ The interest in Greek musical sources was revived in the twentieth century, with a focus on some of the few surviving fragments.¹¹⁵ On the other hand, far less attention was generally accorded to the reception history of Greek music theory, with special attention to the reception of the *systema teleion* addressed below.

Notwithstanding the erroneous connections between the *systema teleion* and the Guidonian system, which emerged in the music-theoretical discourse of the Renaissance, with Gaffurio as one of the principal theorists in pursuit of this problematic connection, facets of the *systema teleion* surfaced in both practical sources and the music-theoretical discourse. In his *De institutione musica*, Boethius included a detailed description of the eight Greek *tonoi*¹¹⁶—a topic which was taken up by a number of Renaissance theorists, among them the aforementioned Gaffurio in his *Theorica musice*, as well as Pietro Aaron (ca. 1480 - 1545) in his *Toscanello de la musica* (Venice, 1523) and Heinrich Glarean (1488-1563) in his *Dodecachordon* (Basel, 1547), in their in-depth examinations of the ethos associated with each mode, based on the particular theorist's personal interpretation, which in turn accounts for the discrepancies in description.¹¹⁷ For example, in the case of Dorian mode, Gaffurio associates this mode with a feeling of modesty and constancy (*De harmonia* 4.2). Glarean, on the other hand, attributes a majestic and grave feeling to the same mode (*Dodecachordon* 2.21).

While the composers of the Burgundian School of Composition on the whole resorted to the French mensural system as disclosed by Philippe de Vitry, the representatives of the Netherlands School of Composition, benefiting from the Ars nova notation, were frequently preoccupied with a more enigmatic manner of composition, as readily revealed in the fusion of traditional notation and canonic inscriptions,¹¹⁸ thereby often embracing terminology of Greek Antiquity.¹¹⁹ In the Kyrie of his *Missa sine nomine*, Josquin des Prez fuses the traditional notation of the Ars nova for the superius, altus and bassus with a canonic inscription "tenor in dyatessaron sequentibus signis," which calls upon the musician to derive the non-cantus *firmitus* carrying tenor

114 Frieder Zaminer, "Pierre Jean Burette (1665-1747) und die Erforschung der antiken Musik im Rahmen der Pariser Inschriften-Akademie," in *Akademie und Musik—Erscheinungsweisen und Wirkungen des Akademiegedankens in Kultur- und Musikgeschichte: Institutionen, Veranstaltungen, Schriften—Festschrift für Werner Braun zum 65. Geburtstag, zugleich Bericht über das Symposium "Der Akademiegedanke in der Geschichte der Musik und angrenzender Fächer," Saarbrücken 1991*, ed. Wolf Frobenius et al. (Saarbrücken: Saarbrücker Druckerei und Verlag, 1993), 289-99.

115 Thomas J. Mathiesen, "New Fragments of Ancient Greek Music," *Acta Musicologica* 53 (1981): 14-32.

116 Calvin M. Bower, "Boethius and Nicomachus: An Essay Concerning the Sources of *De institutione musica*," *Vivarium* 16 (1978): 1-45; see also John Caldwell, "The *De Institutione Arithmetica* and the *De Institutione Musica*," in *Boethius: His Life, Thought and Influence*, ed. Margaret Gibson (Oxford: Blackwell, 1981), 134-54; Flora Rose Levin, *Nicomachus: The Manual of Harmonics: Translation and Commentary* (Grand Rapids, MI: Phanes, 1994). For more on Nicomachus as the precursor to Boethius, see Flora R. Levin, *The Harmonics of Nicomachus and the Pythagorean Tradition* (University Park, PA: The American Philological Association, 1975); Michaelides, *The Music of Ancient Greece*, 110-13.

117 For an overview of this topic, see Claude V. Palisca, "Mode Ethos in the Renaissance," in *Essays in Musicology: A Tribute to Alvin Johnson*, ed. Lewis Lockwood and Edward Roesner ([Philadelphia]: American Musicological Society, 1990), 126-39.

118 On this shift in notation, see Katelijne Schiltz, *Music and Riddle Culture in the Renaissance* (Cambridge: Cambridge University Press, 2015).

119 Bonnie J. Blackburn and Leofranc Holford-Strevens, "Juno's Four Grievances: The Taste for the Antique in Canonic Inscriptions," in *Musikalische Quellen—Quellen zur Musikgeschichte: Festschrift für Martin Staehelin zum 65. Geburtstag*, ed. Ulrich Konrad (Göttingen: Vandenhoeck & Ruprecht, 2002), 159-74.

voice from the superius at a distance of eight *tactus*,¹²⁰ as indicated by the *signum congruentiae* supplied in both the *Manuscript Jena, Thüringer Universitäts- und Landesbibliothek MS 3* (folio 105 verso – 115 recto) and the 1514 print by Ottaviano Petrucci (1466-1539) of the *Missarum Josquin liber tertius*, and at an interval of the perfect fourth, here with reference to the Greek terminology of the tetrachord as a constituent element of both Greek and Latin modes, though with a different internal interval configuration in the Greek and Latin traditions.¹²¹

Within Gioseffo Zarlino's motet cycle based on the Songs of Songs, his setting of "Ecce tu pulchra es," which concludes the first chapter of text, stands distinctly apart from the remaining polyphonic settings in this collection, as Zarlino (1517-1590) resorts to a contrapuntal canon between the superius and the tenor, with the canon highlighted by the *regula* (canonic inscription) "Canon fuga trium tempore in diapason" placed above measure 1 of the tenor and its resolution entering in the superius beginning in measure 9.¹²² Here Zarlino, as a mediator between the *systema teleion* and the Guidonian system, as readily gathered from his *Le istituzioni harmoniche* (Venice, 1558) and his *Dimostrazioni harmoniche* (Venice, 1571), changes from the largely Latin canonic inscription to the Latin transliteration of the Greek *diapason*, with this change obviously borrowed from the music-theoretical discourse, where the Greek nomenclature for indicating intervals is standard practice, and that without the distinction between two distinctly different methods of describing intervals, namely, the one based on the reason (*logos*) of Pythagoras and the other based on the sensory perception (*aisthesis*) of Aristotle.¹²³ In fact, with regard to the identification of intervals with recourse to the *systema teleion*, this practice also found application in polyphonic repertoires north of the Alps. For his "Creator omnium, Deus," the sole motet in the Antwerp Motet Book embracing a canon, Orlando di Lasso (1532-1594) resorts to a canonic inscription "Fuga in diapente" above the altus I with the resolution of the *regula* occurring in tenor II in measure 10, with the respective voices following one another at a distance of one *tactus*.¹²⁴ However, Lasso is not consistent in the wording of his *regula*, as is readily seen, for example, in his motet "Verbum caro factum est," preserved in his *Thesaurus musicus* (Nuremberg, 1564) where the canon at the interval of the sixth is signalled in a completely Latin *regula*, that is, "Canon ad sextum," placed above cantus II, with the resolution occurring in altus II in measure 11.¹²⁵

The canonic procedures, a hallmark of the Netherlands School of Composition, find their continuation on German soil, particularly at the Court of Emperor Maximilian II in Munich, in the œuvre of Orlando di Lasso. In his "De profundi clamavi," of his *Psalmus Sextus penitentialis* [Psalm 129 (130)] from the set of seven *Penitential Psalms*,¹²⁶ Lasso invokes the *systema teleion* in a more concentrated manner when he embraces the intervals of the *subdiapente* and the *diatessaron*, respectively, in two consecutive verses, that is, in Verse 2 to the text "Fiant aures tuae audientibus" in the *regula* "Fuga in subdiapente" above the altus with a resolution of the canonic inscription in

120 Theodor Dumitrescu and Peter Urquhart, *Josquin des Prez: Canonic Masses*, Josquin des Prez: New Edition of the Collected Works 12 (Utrecht: Koninklijke Vereniging voor Nederlandse Muziekgeschiedenis, 2012), 35-66, especially 36-38.

121 Annie Bélis, "Les termes grecs et latins désignant des spécialités musicales," *Revue de philologie, de littérature et d'histoire anciennes* 62 (1988): 227-50.

122 Cristle Collins Judd, ed., *Gioseffo Zarlino: Motets From 1549, Part 1: Motets Based on the Songs of Songs*, Recent Researches in the Music of the Renaissance 145 (Madison, WI: A-R Editions, 2006), 29-34, especially 29.

123 Hermann Walter, "Logos und Aisthesis: Zum Methodenstreit der antiken Musiktheorie," *International Journal of Musicology* 3 (1994): 43-55.

124 James Erb, ed., *Orlando di Lasso: Il primo libro de mottetti a cinque et a sei voci (Antwerp, 1556)*, Recent Researches in the Music of the Renaissance 114 (Madison, WI: A-R Editions, 1998), 103-108, especially 103.

125 Peter Berquist, ed., *Orlando di Lasso: Motets for Four to Eight Voices from Thesaurus musicus (Nuremberg, 1564)* Recent Researches in the Music of the Renaissance 132 (Madison, WI: A-R Editions, 2002), 81-88, especially 81.

126 Peter Berquist, ed., *Orlando di Lasso: The Seven Penitential Psalms and Laudate Dominum de Caelis*, Recent Researches in the Music of the Renaissance 86 (Madison, WI: A-R Editions, 1990), 146-56, especially 148.

the tenor at the interval of a perfect fifth and a distance of one *tactus* and in Verse 3 to the text "Si inequalitates observaveris" in the *regula* "Fuga contraria in diatessaron," that is, the inversion of the altus with its declamatory style (*recitatio*) occurring in the tenor at the interval of a perfect fourth and a distance of one *tactus*. In both verses, Lasso, in his resorting to a *regula*, places special emphasis on his tribute to the ancient psalm tone,¹²⁷ with two facets, namely, the recitation tone and the cadence of the once-transposed Hypolydian mode, underscored in two inner voices (altus and tenor). It is perhaps no surprise that with the *regula* for Verses 2 and 3 of Psalm 129, Lasso is pondering the seemingly close correlation between text and music, perhaps as a conscious reflection upon the *musica reservata*,¹²⁸ with the admonishment of the listener contained in the text "Let thy ears be attentive," poignantly underscored by the words of this *regula* for Verses 2 and 3, embracing the central message of the psalm. That Johann Sebastian Bach (1685-1750) was familiar with the Greek modal system, is readily apparent from his *Fuga canonica in Epidiapente* included in the *Musikalische Opfer*, BWV 1079.¹²⁹

In spite of the gradual waning of interest in the examination of this subject matter, on occasion, however, even musicians who were steeped in the review of musical practices in their treatises and/or correspondence combine their reflections on older compositional traditions with a keen interest in historiography, the latter path of inquiry which naturally leads to an examination of archaic systems, specifically aspects of the *systema teleion* and the Guidonian system. In his *Das beschützte Orchestre* (Hamburg, 1717), Johann Mattheson (1681-1764), interested in music of Antiquity,¹³⁰ who was indebted to Boethius for the transmission of the *systema teleion* in his *De institutione musica* and to Guido of Arezzo for the exposition of the solmization in the *Micrologus* (ca. 1026), places these venerable systems of earlier periods in bold relief to the traditional eighteenth-century music-theoretical discourse—with the resultant coverage of the material responsible for a brief correspondence between Mattheson and George Frederick Handel (1685-1759), with Mattheson's initial letter, dated February 21, 1719, also indicative of Mattheson's more profound interest in Handel as a composer of opera and as biographer of Handel.¹³¹ For Handel, in response to Mattheson's letter, in which Mattheson alludes to his juxtaposition of ancient music theory and contemporary reflections on past and current musical practices, questions the validity of Mattheson's pedagogy in exposing the student of music, and presumably the reader of his treatise at large, to the Greek *tonoi* ("les modes grecs") — a topic to which Handel attributes little relevance in the context of a deeper understanding of "modern music." Indeed, Handel's letter to Mattheson, dated 24 February 1719¹³², on the one hand, juxtaposes the age-old dichotomy of *musica theórica*, a term which embraces the notion of *musica speculativa* or abstract music theoretical thought, and *musica practica*, a term which encompasses the totality of compositional practices and related performance practices of instrumental and vocal repertoires, with this dichotomy constituting the *disciplina musicae* of the consummate fully-trained *musicus*, as opposed to the *cantor* (also known as

127 Mattias Lundberg, *Tonus Peregrinus: The History of a Psalm Tone and Its Use in Polyphonic Music* (Farnham: Ashgate, 2011).

128 Maria Rika Maniates, *Mannerism in Italian Music and Culture, 1530-1630* (Chapel Hill: University of North Carolina Press, 1979).

129 For a resolution of this canon, see Christoph Wolff, ed., *Johann Sebastian Bach; Kanons [and] Musikalisches Opfer*, Johann Sebastian Bach: Neue Ausgabe sämtlicher Werke, ser. 8, vol. 1 (Kassel: Bärenreiter, 1974), 75-77.

130 Hans Nehrling, "Die antiken Versfüße, ihre Problematik und Überlieferung bei Johann Mattheson," in *Musik als Text: Bericht über den Internationalen Musikwissenschaftlichen Kongreß, Freiburg im Breisgau, 28. September – 1. Oktober 1993*, 2 vols., ed. Hermann Danuser und Tobias Plebuech (Kassel: Bärenreiter, 1994), 2: 34-37.

131 J. Merrill Knapp, "Mattheson and Handel: Their Musical Relations in Hamburg," in *New Mattheson Studies*, ed. George J. Buelow and Hans Joachim Marx (Cambridge: Cambridge University Press, 1983), 307-26; Alfred Mann, "Mattheson as Biographer of Handel," in *ibid.*, 345-52.

132 John Mainwaring, *G. F. Händel: Nach Johann Matthesons deutscher Ausgabe von 1761 mit anderen Dokumenten*, ed. Bernhard Paumgartner, 2nd ed. (Zurich: Atlantis, 1987), 166-69.

the *phonascus*) whose knowledge is restricted solely to the practice of music without recourse to the theory underlying the practice.¹³³ On the other hand, this letter draws into question the retention of this dichotomy in the era of the baroque.

As late as the mid-eighteenth century, the preoccupation with the music systems of Antiquity, the Middle Ages and the Renaissance informs the contemporary music-theoretical discourse focussed on organology and performance practices—a fact which is readily gathered from the *Gründliche Violinschule* (Augsburg, 1789) of Leopold Mozart (1719-1787) and, admittedly to a lesser extent, from the *Versuch die Flöte traversiere zu spielen* (Berlin, 1752) of Johann Joachim Quantz (1697-1773).

In his "A Short History of Music" ("Versuch einer kurzen Geschichte der Musik"), which forms part of the introduction to the *Gründliche Violinschule*, Leopold Mozart, in a characteristic humanist vein,¹³⁴ with which he was thoroughly acquainted as a result of his familiarity with a broad range of written documentation, including compendia, commentaries, treatises, speeches, letters, and translations, discloses a lengthy list of major contributors to the unfolding of historiography—an enumeration of names that at first glance seems to carry little intrinsic meaning within the overall treatise focussed on contemporary violin pedagogy, directly related to violin organology and performance practice. However, in his letter of November 6, 1755, which forms an integral part of the copious correspondence, comprising some twenty-seven letters, written between April 1755 and April 1756, with the editor and publisher of his *Gründliche Violinschule*, Johann Jakob Lotter (1726-1804), Leopold Mozart focuses on the text of his treatise in the galley proof stage, showing utmost sensitivity with regard to the order in which the individual music theorists are identified, with a request for emendations of the comprehensive listing,¹³⁵ so as to document a coherent unfolding of the music-theoretical discourse. Incidentally, the approach of L. Mozart to musical humanism, in which the Greek *systema teleion* forms an integral part in the overall deliberations, in the cryptic listing of important contributors to musical historiography, shows a rather close affinity to Gaffurio, with the density of the presentation in the opening chapter of the *Theorica musicae* stemming from the disclosing of names, and that without reference to the individual contribution(s) of the writers mentioned or the contextualization of their scholarship. In fact, the importance of Gaffurio and the dissemination of his music-theoretical thought to subsequent generations of musicians, is readily apparent in the *Proportiones practicabiles secundum Gaffurium* of John Dygon (flourished 1497-1538).¹³⁶ Beyond that volume, the reception of Gaffurio's theoretical discourse is fully borne out by the fact that within L. Mozart's *Gründliche Violinschule*, Gaffurio is the only theorist to receive two distinct references in the chapters framing "A Short History of Music" of the *Gründliche Violinschule*, namely, to the *Theorica musicae*¹³⁷ and *Practica*

133 Dagmar Hoffmann-Axthelm, "'Musicus und Cantor': Kontinuität und Wandel eines Topos durch (mehr als) ein Jahrtausend," *Basler Jahrbuch für Historische Musikpraxis* 32 (2008): 13-29.

134 For more on this facet of scholarship during the humanist era, see Gaffurio, *Theorica musicae* 1.1; see also Kreyszig, trans., *Franchino Gaffurio: The Theory of Music*, 7-29.

135 Wilhelm A. Bauer and Otto Erich Deutsch, eds., *Mozart: Briefe und Aufzeichnungen — Gesamtausgabe*, 7 vols. (Kassel: Bärenreiter, 1962-1975), 1: 1-48, especially p. 19; see also Albi Rosenthal, "Leopold Mozart's *Violinschule* Annotated by the Author," in *Mozart Studies*, ed. Cliff Eisen (Oxford: Clarendon Press, 1991), 83-99.

136 Theodor Dumitrescu, ed. and trans., *John Dygon's Proportiones practicabiles secundum Gaffurium* (Urbana: University of Illinois Press, 2006).

137 Leopold Mozart, "Der Einleitng zweyter Abschnitt: Von dem Ursprunge der Musik, und der [sic, den] musikalischen Instrumenten," in *Gründliche Violinschule*, 1789, facsimile repr. with a preface by David Oistrach (Wiesbaden: Breitkopf & Härtel, 1983), 11. For the English translation, see Editha Klocker, trans., "Introduction—Second Section: Of the Origins of Music, and Musical Instruments," *A Treatise on the Fundamental Principles of Violin Playing by Leopold Mozart*, 2nd ed. (Oxford: Oxford University Press, 1951; repr. 1985), 17.

musicae,¹³⁸ respectively—a facet which points beyond a mere coincidence. While the majority of music theorists mentioned in the “Short History of Music” contribute to the system of the Latin modes and/or tonality, a number of writers identified also make reference to the *systema teleion* as a hierarchical scale system¹³⁹ central to the development of *musica* as a *scientia speculativa* and *scientia practica*.¹⁴⁰ The union of *musica theoria* (that is, *musica speculativa*) and *musica practica* (that is, *compositio*) is central to the music-theoretical discourse and the all-encompassing aesthetics of Zarlino, who, in his two treatises, that is, the *Le istituzioni harmoniche* and *Dimostrazioni harmoniche*,¹⁴¹ underscores the perfection of *musica*, and that in the consideration of both subdisciplines as a perfect union between rational faculty (*facultas rationalis*) and sensory perception (*perceptio sensuum*).¹⁴² With the mentioning of Zarlino, L. Mozart touches on a theorist, known for his all-encompassing aesthetics, which arises out of his vast discourse on *musica theoria*, *arithmetica*, *cosmologia*, *historia*, *philosophia*, and *theologia*.¹⁴³ In his *Le istituzioni harmoniche*, Zarlino expands the *tetraktys* (represented by the integers 1, 2, 3, 4),¹⁴⁴ by which several of his predecessors, such as Bartolomeus Ramos de Pareja (ca. 1440–after 1490) in his *Musica practica* (Bologna, 1482), Giovanni Spataro (1458–1541) in his *Tractato di musica* (Venice, 1531), Lodovico Fogliano (ca. 1475–1542) in his *Musica theoria* (Venice, 1529)¹⁴⁵ and Gaffurio were able to derive the consonances of the *genus multiplex* (with the *diapason* represented in the ratio 2:1) and the *genus superparticularis* (with the *diapente* as 3:2; *diatessaron* as 4:3; and *diapason-plus-diapente* as 3:1; and the *bisdiapason* as 4:1), to the *senario* (represented by the integers 1, 2, 3, 4, 5, 6), that is, the division of the string into 2, 3, 4, 5 and 6 equal segments (*passus*), in order to extend the consonances to encompass the major third (5:4), minor third (6:5), major sixth (5:3), and minor sixth (8:5),¹⁴⁶ the latter owing to its position outside the *senario*, which had to be accounted for through the process of adding the intervals of a perfect fourth and a minor third ($4/3 \times 6/5$), with the expanded scheme of consonances justified in the context of the syntonic

138 Mozart, “Des ersten Hauptstücks erster Abschnitt: Von den alten und neuen musikalischen Buchstaben und Noten, wie auch von den itzt gewöhnlichen Linien, und Musikschlüsseln,” in *Gründliche Violinschule*, 21; Knocker, trans., “Chapter 1: Of the Old and New Musical Letters and Notes, together with the Lines and Clefs Now in Use,” in *A Treatise*, 25.

139 See, for example, Reginald P. Winnington-Ingram, “The Spondeion Scale,” *The Classical Quarterly* 22 (1928): 83–91.

140 Even through the era of Viennese classicism, the art of composition was perceived as a *Kompositionswissenschaft*; at least in the eyes of Haydn, who resorted to this term in summarizing and praising Mozart’s skill and achievement as a composer; as reported by Leopold Mozart in a letter to his daughter Maria Anna, dated Vienna, 16 February 1785, printed in Bauer and Deutsch, eds., *Mozart: Briefe und Aufzeichnungen*, 3: 373.

141 For a continuation of Zarlino’s thoughts as expressed in his *L’istituzione harmoniche* (1558) and *Dimostrazioni harmoniche* (1571), see John Emil Kelleher, “Zarlino’s ‘Dimostrazioni Harmoniche’ and Demonstrative Methodologies in the Sixteenth Century” (PhD diss., Columbia University, 1993).

142 Wolfgang Horn, “*Est modus in rebus ...*”: *Gioseffo Zarlino’s Musiktheorie und Kompositionslehre und das Tonarten-Problem in der Musikwissenschaft*, 2 vols. (Hannover: [no publisher], 2000).

143 Raffaello Monterosso, “L’estetica di Gioseffo Zarlino,” *Chigiana* 24 (1967): 13–28. Zarlino’s deliberations are focused on the *quadrivium* as well as on the concept of the *musica mundana*; see, Paolo Sanvito, “Le sperimentazioni nelle scienze quadriviali in alcuni epistolari Zarlinoiani inediti,” *Studi musicali* 19 (1990): 305–18; Brigitte van Wymeersch, “La musique comme reflet de l’harmonie du monde: L’exemple de Platon et de Zarlino,” *Revue philosophique de Louvain* 97 (1999): 289–311.

144 Benito R. Rivera, “Theory Ruled by Practice: Zarlino’s Reversal of the Classical System of Proportions,” *Indiana Theory Review* 16 (1995): 145–70. For a discussion of the *tetraktys*, see Palisca, *Humanism*, 244–50.

145 Claude V. Palisca, “The Science of Sound and Musical Practice,” in *Science and the Arts in the Renaissance*, ed. John William Shirley and F. David Hoeniger (Washington, D.C.: Folger Shakespeare Library; London: Associated University Presses, 1985), 59–73; Claude V. Palisca, “Humanism and Music,” in *Humanism and the Disciplines*, ed. Albert Rabil Jr. (Philadelphia: University of Pennsylvania Press, 1988), 450–85.

146 William Roy Bowen, “Music and Number: An Introduction to Renaissance Harmonic Science” (PhD diss., University of Toronto, 1984); see also Kurt von Fritz, “The Discovery of Incommensurability by Hippasus of Metapontum,” *Annals of Mathematics* 46 (1954): 242–64.

diatonic tuning, already advocated by Claudius Ptolemy (flourished 127-148 C.E.) in his *Harmonics* and subsequently adopted by Gaffurio (in his *De harmonia* 2.18ff.), yet eventually subject to criticism by Galilei in his *Dialogo*¹⁴⁷—a fact which presumably accounts for Leopold Mozart's inclusion of his name in the list of theorists.

Galilei opposed the views of his teacher Zarlino, who had set forth musical rules based on rational principles of arithmetic. In his *Dialogo*, Galilei replaced the syntonic-diatonic tuning of Zarlino with a tuning of vocal music, considered a compromise between the Pythagorean system with its pure fifth and Ptolemy's syntonic diatonic with its consonant third. This flexibility allowed for both consonant chords and the infusion of chromaticism, in substituting the modern modes for the *tonoi* of the *systema teleion*. It was the *tonoi*, which Galilei, on the one hand, considered as most inappropriate for the time, while, on the other hand, he advocated the continued imitation of the ancient Greek tradition, specifically in the firm adherence to the monodic style with its single line characterized by the narrow vocal range and the rhythmic inflections of poetry and speech. Indeed, Galilei's more antiquarian perspective is readily seen in his overview of organology in his *Fronimo* (Venice, 1568) and notational systems, the latter which include the reproducing of the Alypian tables as a key to unlocking the Greek notation.¹⁴⁸

In his widely disseminated twelve-volume *Margarita philosophica* (Freiburg im Breisgau, 1503), the first encyclopedia of philosophy to appear in Germany, and one of the principal monuments of medieval meterology, Gregor Reisch (ca. 1467-1525), the cleric from the Diocese of Konstanz and recipient of a *magister atrium* (1489) from the University of Freiburg im Breisgau, who subsequently held a number of diverse professional portfolios as instructor at the *Universität Ingolstadt* and *Universität Freiburg*, and as scholarly and spiritual councillor of Emperor Maximilian I (reigned 1508-1519), in Book 5 of his treatise touches on the pillars of the music theoretical and music philosophical discourse, including the Guidonian system of the modes and solmization as well as the *divisiones monochordi*¹⁴⁹ and the *systema teleion*, the latter with reference to a number of Greek and Latin authorities, including Asclepiades de Bithynia (ca. 130 – ca. 40 B.C.E.), Jubal, Plato, Pythagoras, Boethius and Saint Augustine of Hippo (354-430 C.E.)¹⁵⁰, with the latter author signalling the end of Antiquity.

Among the list of prominent writers supplied in the aforementioned "A Short History of Music," Leopold Mozart's inclusion of Giovanni Battista Doni (1595-1647) is indicative of a considerable widening of the scope of inquiry beyond the overall listing of predominantly

147 Claude V. Palisca, "Scientific Empiricism in Musical Thought," in *Seventeenth-Century Science and the Arts*, ed. Hedley H. Rhys (Princeton, NJ: Princeton University Press, 1961), 91-137.

148 For a reproduction of the Alypian tables, see Mathiesen, *Apollo's Lyre*, 599; James Murray Barbour, "The Principles of Greek Notation," *Journal of the American Musicological Society* 13 (1960): 1-17.

149 Robert Ritter von Srbik, *Die Margarita philosophica des G. Reisch (+1525): Ein Beitrag zur Geschichte der Naturwissenschaften in Deutschland* (Vienna: Hölder-Pichler-Tempsky and Akademie der Wissenschaften, 1941); Robert [Ritter von] Srbik, "Maximilian I. und Gregor Reisch," *Archiv für Österreichische Geschichte* 122 (1961): 235-340; also published as *Maximilian I. und Gregor Reisch*, ed. Alphons Lhotsky (Vienna: H. Böhlau Nachf., Kommissionsverlag der Österreichischen Akademie der Wissenschaften in Wien, 1961); Andrew Barker, "Aristoxenos' Theorems and the Foundations of Harmonic Science," *Ancient Philosophy* 4 (1984), 23-64; Malcolm Litchfield, "Aristoxenus and Empiricism: A Reevaluation Based on His Theories," *Journal of Music Theory* 32 (1988): 51-73; see also Gaston G. Allaire, *The Theory of Hexachords, Solmisation and the Modal System: A Practical Application*, (Rome: American Institute of Musicology, 1972); David E. Creese, *The Monochord in Ancient Greek Harmonic Science* (Cambridge: Cambridge University Press, 2010).

150 J. T. Vallance, *The Lost Theory of Asclepiades of Bithynia* (Oxford: Clarendon Press, 1990); Judith Cohen, "Jubal in the Middle Ages," *Yaval* 3 (1974): 83-99; Marsilio Ficino, trans., *Plato: Opera* (Basel: Heinrich Petri, 1576); Andrew Hicks, *Composing the World: Harmony in the Medieval Platonic Cosmos* (Oxford: Oxford University Press, 2017); Christiane L. Joost-Gaugier, *Measuring Heaven: Pythagoras and His Influence on Art in Antiquity and the Middle Ages* (Ithaca, NY: Cornell University Press, 2006); William Roy Bowen, "St. Augustine in Medieval and Renaissance Musical Science," in *Augustine on Music: An Interdisciplinary Collection of Essays*, ed. Richard R. La Croix (Lewiston, NY: Edwin Mellen, 1988), 29-51.

contributors to music theory. In the case of Doni, fluent in both Greek and Latin, with his training in the disciplines of languages, geography and mathematics, Mozart turns his attention to a classicist and philologist, less interested in the prevailing contemporary historiography, but rather committed to a revitalization of the old traditions for contemporary practice, with his intent clearly witnessed in his *Compendio dell trattato de' generi e de' modi della musica* (Rome, 1635). In this treatise, Doni offers a contemporary interpretation of the *systema teleion* in its application to modern composition. In his later *De praestantia musicae veteri* (Florence, 1647), Doni continues his preoccupation with the *systema teleion* in the clarification of the concept of the *genus* (chromatic and enharmonic)—a facet of the Greek melodic system which Nicola Vicentino (1511-ca.1576) had failed to address in his *L'antica musica* (Rome, 1557), where he vehemently voiced his objection to the Pythagorean tradition in favour of Aristotle and Aristoxenos.¹⁵¹ Doni, in his contribution to the already much debated classification of the tetrachords according to Aristoxenos, Archytas of Tarent (435-410 B.C.E. – 355-350 B.C.E.), Didymus Chalcenterus (63 B.C.E. – 10 C.E.), and Ptolemy¹⁵², and the more contemporary interpretation of this topic in the *Musica theorica* (Venice, 1529) of Fogliano,¹⁵³ the *Discorso sopra la musica antica e moderna* (Venice, 1602) and the *De modis musicis antiquorum ad Petrum Victorium libri III*, preserved in *Manuscript Rome, Biblioteca Apostolica Vaticana, MS. Lat. 5323*, both of Girolamo Mei (1519-1594),¹⁵⁴ in the *De musica libri septem* (Salamanca, 1577; 2nd ed. 1592) of Francesco de Salinas (1513-1590), in the *Theoria musicae* (1.1 ff.) of Gaffurio, in the *Dialogo della musica* and in the *Discorso intorno* (Florence, 1589), both of Galilei and in the *Le istituzioni harmoniche* of Zarlino (the latter three authors who receive mention in L. Mozart's brief account on the history of music), extended the interpretation of the seven octave species by Ptolemy in his *Harmonics* to the even *modi*, with each *modus* encompassing seven tones with the characteristic interval content (two whole tones followed by a half tone, followed by three whole tones, followed by a half tone),¹⁵⁵ in essence according to the feature of transposition for the Dorian mode by Ptolemy¹⁵⁶ to the remaining octave species of the *systema teleion*.¹⁵⁷ A staunch supporter of the Pythagorean tuning, Doni favored the *diatonon* of Didymus with the interval relations 9:8, 10:9 and 16:15, and that in contrast to the diatonic syntonic of Ptolemy with the ratios 10:9, 9:8 and 16:15.¹⁵⁸ In view of Leopold Mozart's own training as a violinist, he was perhaps most attracted to Doni's *Lyra barberina* (1632-1635), a detailed account of the history with iconographic representations of Greek string instruments—a volume which undoubtedly provided for L. Mozart a means of retracing his own instrument historically to Antiquity and the early Middle Ages, and that through a number of instruments developed by Doni himself, such as the *lyra barberina*, the *violone panarmonico* and the

151 Pietro d'Abano, *Expositio problematum Aristotelis (cum text latine)* (Mantua: Paulus Johannis de Puzpach, 1475); see also F. Alberto Gallo, "Greek Text and Latin Translations of the Aristotelian *Musical Problems*: A Preliminary Account of the Sources," in *Music Theory and Its Sources: Antiquity and the Middle Ages*, ed. Charles André Barbera (Notre Dame, IN: University of Notre Dame Press, 1990), 190-96; Barker, "Aristoxenos' Theorems," 23-64; Litchfield, "Aristoxenus and Empiricism," 51-73.

152 Carl A. Huffman, *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King* (Cambridge: Cambridge University Press, 2005); see also Alan C. Bowen, "The Foundations of Early Pythagorean Harmonic Science: Archytas, Fragment 1," *Ancient Philosophy* 2 (1982): 79-104; R. C. Phillips, "Mean Tones, Equal-Tempered Tones, and the Harmonic Tetrachords of Claudius Ptolemy," *Memoirs and Proceedings of the Manchester Literary and Philosophical Society* 48 (1904): 1-8.

153 Palisca, *Humanism*, 235-44.

154 Eisuke Tsugami, ed. *Girolamo Mei: De modis* (Tokyo: Keiso Shobo, 1991).

155 Martin Vogel, "Die Zahl Sieben in der spekulativen Musiktheorie" (PhD. diss. University of Bonn, 1954).

156 Hugo Riemann, "Die dorische Tonart als Grundskala der griechischen Notenschrift," *Sammelbände der Internationalen Musikgesellschaft* 4 (1902-1903): 558-69.

157 Claude V. Palisca, "Giovanni Battista Doni's Interpretation of the Greek Modal System," *Journal of Musicology* 15 (1997): 3-18.

158 James Murray Barbour, *Tuning and Temperament: A Historical Survey*, 2nd ed. (East Lansing: Michigan State College Press, 1953).

violino diarmonico.¹⁵⁹ In the case of Doni, the considerable broadening of the examination to the *systema teleion*, that is, lifting the *systema teleion* out of its tradition of Antiquity and tracing the significance of the Greek scale in a decisively contemporary practice, with recourse to the discipline of organology—an approach to which L. Mozart presumably took considerable liking in his *Gründliche Violinschule*—finds a continuation in the scholarship of Solon Michaelides, who in his encyclopedia juxtaposes the *systema teleion* of Antiquity with an application of this venerable scalar system to the musical instruments, with a detailed consideration of the lyra, what he calls “the pre-eminent national instrument of ancient Greece”¹⁶⁰—an instrument with a lengthy history extending into the era of the Renaissance and beyond, with this lineage familiar to Leopold Mozart.

With the mentioning of Johann Joachim Quantz (1697-1773), the eminent flutist, organologist, author of the *Versuch einer Anweisung die Flöte traversière zu spielen* (Berlin, 1752), and teacher, foremost of Frederick the Great (1712-1786), under whom he was employed at the Court of Sansoucci in Potsdam, L. Mozart returns to a true *musicus*, one familiar with both branches of the *disciplina*, namely, *musica theórica* and *musica practica*, as readily illustrated in his *Versuch*. In his discussion of the range of the flute in Chapter 3 entitled “Of the Fingering or Application, and the Gamut or Scale of the Flute” of his *Versuch*, Quantz, in his defence of the untempered tuning, includes a number of poignant references to the *diesis* (smaller semitone, defined by the ratio 256:243) and *apotome* (larger semitone, defined by the ratio 2187:2048),¹⁶¹ with reference to the “kleine Halbton” (small semitone) and “große Halbton” (large semitone), as well as to the Greek terminology of the *diesis*, however, not of the *apotome*. On the whole, the overall discussion of the untempered scale is congruent with the tenor of Mozart’s presentation of the chromatic scale in his *Gründliche Violinschule*, with the designation of the pitches within the chromatic scale, particularly with recourse to the flat and the sharp, and the effect of the notation on the bowing, addressed in a letter of Leopold Mozart to Lotter in Augsburg, dated Salzburg, December 22, 1755, preserved in the British Library under the siglum *Add. MS 19437*,¹⁶² with this document implicitly drawing on the smaller and larger semitones.

159 Claude V. Palisca, *G. B. Doni's Lyra Barberina: Commentary and Iconographical Study—Facsimile Edition with Critical Notes* (Bologna: A.M.I.S., 1981). That Doni’s interests in organology extended far beyond the string instruments is amply documented in the secondary literature; see, Patrizio Barbieri, “Gli strumenti poliarmonici di G. B. Doni e il ripristino dell’antica musica greca (ca. 1630-1650),” *Analecta musicologica: Veröffentlichungen der Musikgeschichtlichen Abteilung des Deutschen Historischen Instituts in Rom* 30 (1998): 79-114.

160 Michaelides, *The Music of Ancient Greece*, 189-93, especially 189; see also Martha Maas and Jane McIntosh Snyder, *Stringed Instruments of Ancient Greece* (New Haven, CT: Yale University Press, 1989), 36; Mathiesen, *Apollo's Lyre*, 237-70.

161 Johann Joachim Quantz, “Das III. Hauptstück: Von der Fingerordnung oder Application, und der Tonleiter oder Scala der Flöte,” in *Versuch einer Anweisung die Flöte traversière zu spielen*, 1752, repr. with a forward by Hans-Peter Schmitz (Kassel: Bärenreiter, 1983), paragraphs 3 (for *diesis*) and 8 (for *apotome*); trans. by Edward R. Reilly as “Chapter 3: Of the Fingering or Application, and the Gamut or Scale of the Flute,” in *Johann Joachim Quantz: On Playing the Flute*, 2nd ed. (New York: Schirmer, 1985; repr. Boston: Northeastern University Press, 2001).

The *diesis* is derived as follows:

diapason (2/1) – *diapente* (3/2 = fourth (4:3)

diatessaron (4:3) – two *tonos* = 4:3 – (9:8) x 2 = 256:243

In his treatise, Quantz mentions neither the arithmetic ratio nor the derivation thereof

The *apotome* is derived as follows:

Tonus – *diesis* = 9/8 – 256:243 = 2187:2048

In his treatise, Quantz mentions neither the arithmetic ratio nor the derivation thereof.

162 Anja Morgenstern, “Ein unbekannter Brief von Leopold Mozart an Johann Jakob Lotter aus dem Jahre 1755 zur Violinschule,” *Mozart-Jahrbuch* (2014): 307-13.

Undoubtedly, Mozart, in his preoccupation with the musical humanist tradition¹⁶³, must have left an undeniable impact upon his son¹⁶⁴, for Wolfgang Amadeus (1756-1791), with his interest in ancient languages (Greek and Latin)¹⁶⁵, resorted to certain facets of the Greek *systema teleion* in his own teaching, as becomes readily apparent from the notebook of his most advanced student, Thomas Attwood (1765-1838).¹⁶⁶ In the *Harmonieübungen*, W. A. Mozart, in his notation of the two-octave chromatic scale, consciously steers away from the interpretation of pitches, such as *cis* und *des*, as enharmonic spellings of one another, and that by introducing an alternate nomenclature, that is, *c diesis* for *cis* (English *c-sharp*) and *D b moll* for *des* (English *d-flat*). At that very moment, W. A. Mozart, like Quantz, is obviously thinking not of the equal temperament but rather of the older Pythagorean tuning, where the *c diesis* or *cis* is not equal distant between the *c* and the *d* but rather spatially closer to the *c* than to the *d*. Likewise, the *D b moll* is spatially closer to the *d* and to the *c*. In order to communicate this message without a lengthy written explanation, W.A. Mozart introduces Attwood to the concept of the *diesis*, which, according to the School of Aristoxenos, as reported by Theon of Smyrna, "is the quarter-tone."¹⁶⁷ On the other hand, Aristides Quintilianus himself defines the *diesis* as "the smallest interval of the voice"¹⁶⁸—a definition which in turn is congruent with Aristoxenos's own observation, namely, that "the voice cannot differentiate, nor can the ear discriminate, any interval smaller than the smallest *diesis*."¹⁶⁹ Later in the *Harmonieübungen*, Attwood makes reference to the "greater half tone," denoting the interval between *c* and *D b moll*, in reference to W.A. Mozart's earlier terminology¹⁷⁰ and 'the lesser half tone', obviously in reference to the Greek *apotome*¹⁷¹ and the *diesis*, respectively.¹⁷² Curiously enough, W.A. Mozart does not make explicit mention of the 'greater half tone' or the Greek equivalent, that is, the *apotome*, but such discussion between teacher and student must have taken place orally, presumably in connection with the examination of the tetrachordal *genera*. Even at the beginning of the nineteenth century, aspects of the Greek *systema teleion* continue to surface at least in dictionaries, as is readily seen in detailed discussion of the intervals by Heinrich Christoph Koch

163 Walter Kurt Kreyszig, "Leopold Mozart ... a man of much ... sagacity": The Revival of Humanist Scholarship in his *Gründliche Violinschule* (Augsburg, 1789)," in *Music's Intellectual History: First Conference of the Répertoire International de Littérature Musicale, The City University of New York Graduate Center, 17-19 March 2005*, ed. Zdravko Blažekovič and Barbara Dobbs Mackenzie (New York: Répertoire International de Littérature Musicale, 2009), 43-156.

164 Wolfgang Amadeus Mozart's interest in the humanist tradition is readily seen from the holdings in his own library, such as, Heinrich Braun, *Einleitung in die Götterlehre der alten Griechen und Römer: Zum Gebrauch der Schulen* (Augsburg: Elias Tobias Lotter, 1776); see Manuel Lichtwitz, "Brauns Götterlehre. Augsb. 776," in "*Allzeit ein buch*": Die Bibliothek Wolfgang Amadeus Mozarts — Ausstellung im Malerbuchkabinett der Bibliotheca Augusta vom 5. Dezember 1991 bis zum 15. März 1992, ed. Ulrich Konrad and Martin Stachelin (Weinheim an der Bergstrasse: VCH Acta Humaniora, 1991), 72-73.

165 Ulrich Konrad, "On Ancient Languages: The Historical Idiom in the Music of Wolfgang Amadé Mozart," trans. Thomas Irvine, in *The Century of Bach and Mozart: Perspectives on Historiography, Composition, Theory and Performance*, ed. Sean Gallagher and Thomas Forrest Kelly (Cambridge, MA: Harvard University, 2008), 253-78.

166 Erich Hertzmann, Cecil B. Oldman, Daniel Hertz, and Alfred Mann, eds., *Wolfgang Amadeus Mozart: Neue Ausgabe sämtlicher Werke*, ser. 10, Werkgruppe 30, vol. 1 (Kassel: Bärenreiter, 1965), 8.

167 Theon of Smyrna; as cited in Michaelides, *The Music of Ancient Greece*, 81; see also Eduard Hiller, ed., *Theonis Smyrnaei philosophi Platonici: Expositio rerum mathematicarum ad legendum Platonem utilium* (Leipzig: B. G. Teubner, 1878; reprint New York: Garland, 1987).

168 Aristides Quintilianus, *De musica*, as cited in Michaelides, *The Music of Ancient Greece*, 81; see also Charles W. L. Johnson, "The Motion of the Voice in the Theory of Ancient Music," *Transactions of the American Philological Association* 30 (1899): 42-55

169 As cited in Michaelides, *The Music of Ancient Greece*, 81.

170 Hertzmann and Oldman, *Thomas Attwoods Theorie- und Kompositionsstudien*, 8

171 For an overview of the *apotome*, see Michaelides, *The Music of Ancient Greece*, 26.

172 Hertzmann and Oldman, *Thomas Attwoods Theorie- und Kompositionsstudien*, 27.

(1749-1816), with the reference to the *diesis* (ratio 128:125) capturing a facet of the Pythagorean tradition.¹⁷³

Conclusion

In our continued study of the Greek *systema teleion*, we, too, need to cast aside an exceedingly stringent preoccupation with issues of origin wrapped into a broader consideration of historiography and instead focus on a more in-depth examination of the Greek *systema teleion per se*, in order to engage more fully in the (re)discovery of the Greek *tonoi*, with their subtle intricacies, unforeseen complexities, and hidden aural beauties, with the notion of *kalos* (beauty), understood here in a perceptual context,¹⁷⁴ specifically as an experience of pleasure or satisfaction, firmly anchored in Greek culture and aesthetics,¹⁷⁵ reaching back to the pre-socratic era of Pythagoras and its association with Orpheus,¹⁷⁶ and continuing in the writings of Plato¹⁷⁷ as well as occupying a place of prominence in the music-philosophical reflections of Johann Gottfried von Herder (1744-1803).¹⁷⁸

In the endeavour mentioned above, our examination will be greatly enhanced by the multifaceted explorations of the Greek *systema teleion* not only in scholarly papers, monographs, and bibliographic studies but also in the encyclopedic literature. Among the latter contributions we pay special tribute to the seminal contribution made by Solon Michaelides with his *Music in Ancient Greece: An Encyclopaedia*—a volume, which by the very nature of its cogent organization and transparency in content, even nearly forty years after its publication, offers a much needed introduction to our ongoing pre-occupation with the Greek *systema teleion*, both in the narrow sense as the musical space of circumscribing and defining the eight melodic modes of the Greeks and in the broad sense of associating this musical system with other important facets of Greek culture, including dance, *paideia*, and religion. Here, Michaelides's *Music in Ancient Greece: An Encyclopaedia* has undoubtedly provided an invaluable document in understanding the *systema teleion*, central to the study of music theoretical sources in the Medieval university,¹⁷⁹ as a framework for forming melodies,¹⁸⁰ and that as a genuine and unique system independent of its younger Latin modal

173 See entry "Groß," in Heinrich Christoph Koch, *Musikalisches Lexikon*, facsimile repr. with an introduction by Nicole Schwindt (Kassel: Bärenreiter, 2001), 625-98, especially 698.

174 Francis Ames-Lewis and Mary Rogers, eds., *Concepts of Beauty in Renaissance Art* (Aldershot: Ashgate, 1998). The idea of beauty associated with the Greek *tonoi* is still alive in nineteenth-century discourse; see Georg Joseph Vogler, *Abt. Vogler's Choral-System: Zwölf griechische Tonarten [...]* (Copenhagen and Stockholm: Kongl. Privilegierade Not-Tryckeriet, 1800); see also Georg Joseph Vogler, "Jede Quelle der Schönheit von ihrer Entstehung an, bis auf den letzten Augenblick aufdecken," in Wolfgang Grätzer, *Komponistenkommentare: Beiträge zu einer Geschichte der Eigeninterpretation* (Vienna: Böhlau, 2003), 93-114.

175 Thomas J. Mathiesen, "Music, Aesthetics, and Cosmology in Early Neo-Platonism," in *Paradigms in Medieval Thought Applications in Medieval Disciplines: A Symposium*, ed. Nancy van Deusen and Alvin E. Ford (Queenston, ON: Edwin Mellen, 1990), 57-60.

176 Rudolf Heinz, "Klang-Kallistik: Notizen zu Orpheus und der Schönheit der Musik," in Rudolf Heinz, *Psychopathologie, Logik, Sinne: Affekte, Musik, bildende Kunst* (Essen: Die blaue Eule, 1987), 172-87; also in *Der Schein des Schönen*, ed. Dietmar Kamper and Christoph Wulf (Göttingen: Steidl Gerhard, 1989), 411-24.

177 [Anonymous], *The Idea of Beauty According to the Doctrine of Plato* (Edinburgh: [no publisher], 1756); see also Andrew Barker, "Mathematical Beauty Made Audible: Musical Aesthetics in Ptolemy's *Harmonics*," *Classical Philology* 105 (2010): 403-25.

178 Wilhelm Dobbek, "Johann Gottfried Herder: Kallichoe, der Quell der Schönheit," in *Festschrift für Walter Wiora zum 30. Dezember 1966*, ed. Ludwig Finscher and Christoph-Hellmut Mahling (Kassel: Bärenreiter, 1967), 105-11.

179 For more on this topic, see Michel Huglo, "The Study of Ancient Sources of Music Theory in the Medieval Universities," in *Music Theory and Its Sources: Antiquity and the Middle Ages*, ed. Charles André Barbera (Notre Dame, IN: University of Notre Dame Press, 1990), 150-72.

180 Andrew Barker, "Theophrastus on Pitch and Melody," in *Theophrastus of Eresius: On His Life and Work*, ed. William Wall Fortenbaugh et al. (New Brunswick, NJ: Transaction Books, 1985), 289-324.

system, with which it erroneously had been associated throughout much of the era of musical humanism.

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Abstract

The unprecedented multifaceted interest in the music of ancient Greece during the 1970s resulted in a number of seminal publications, including Egert Pöhlmann's *Denkmäler altgriechischer Musik* (Nuremberg, 1970); Thomas Mathiesen's *A Bibliography of Sources for the Study of Ancient Greek Music* (Hackensack, NJ, 1974) and Annemarie Jeanette Neubecker's *Altgriechische Musik: Eine Einführung* (Darmstadt, 1977), and Solon Michaelides's *The Music of Ancient Greece: An Encyclopaedia* (London, 1978). The latter volume is exemplary in its broad coverage of numerous topics, including dance, ethos, metrics, musical instruments, and poetry, and above all ancient Greek music theory. Michaelides focuses on the Greek *systema teleion*, with its complex terminology readily seen in a number of terms with multiple meanings, such as the *harmoniai*, embracing the concepts of *diapason*, *genos*, *intervallum*, *melodia*, *musica*, *systema teleion*, and *tropos*, all of which Michaelides sets distinctly apart from one another, with each definition fully supported by the identification of *loci paralleli* within the vast primary sources. Hitherto, Michaelides was the first scholar to offer a truly encyclopedic coverage of ancient Greek music, with his scholarship providing a cornerstone for the examination and dissemination of the *systema teleion* during the era of musical humanism, 1400-1600, and beyond. He has elegantly paved the way for a number of scholarly endeavours beginning in the 1980s, such as Andrew Barker's *Greek Musical Writings* (Cambridge, 1984-1998); Martin L. West's *Ancient Greek Music* (Oxford, 1992); Warren D. Anderson's *Music and Musicians in Ancient Greece* (Ithaca, NY, 1994), Thomas Mathiesen's *Apollo's Lyre: Greek Music and Music Theory in Antiquity and Middle Ages* (Lincoln, NE, 1999); and Andrew Barker's *Scientific Method in Ptolemy's Harmonics* (New York, 2000).

About the Author

A graduate of the University of Windsor (Honors Bachelor of Music in Performance with Distinction, and 1977 Recipient of the Board of Governor's Medal in Music), Western University (Master of Arts in Musicology, 1980), and Yale University (Master of Philosophy in Musicology, 1983 and Ph.D. in Musicology, 1990), Walter Kurt Kreyszig is Professor Emeritus of Musicology (Department of Music) and an Associate Member, Classical, Medieval, and Renaissance Studies

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