

Diary:
Ancient Greek Theory through Medieval Modes and Origins of Counterpoint

Scholarship on the history of music theory often seems to describe the original sources in terms of two separate "traditions": the speculative tradition, which is divorced from the act of composing or performing music, and the practical tradition, which is closely tied to the functional needs of music-making. Although these two traditions stand in opposition to one another, primary documents in music theory often share at least some characteristics of both.

One of the clearest separations between the speculative and practical trends derives from the first era of music theorizing, as practiced by the ancient Greeks. The Pythagoreans, for example, take a quintessentially speculative tact. Mathiesen calls their work "fundamentally abstract and idealized" and thus unable to address musical practice.¹ Number ratios – as ways of defining intervals – were of significant interest to the Pythagoreans. More generally, these ratios had symbolic relationships with other spheres: music was a metaphor for the cosmos. It was this "paradigmatic" nature of music that the Pythagoreans saw as "underlying its power in human life."²

In contrast to this philosophical viewpoint, Aristoxenus responded with a set of writings around 300 BCE collectively known today as *Elementa Harmonica*. Aristoxenus is self-avowedly unconcerned with any explanation of music that does not aide or reflect the perception of music. In this sense, Aristoxenus may be the first phenomenologist of music. He goes into depth on discussing the irrelevance of describing pitch as a vibration, for example, because to a musician, a single pitch is stability not motion.³ In other words, Aristoxenus explicitly discards

¹ (Mathiesen 2002, 117).

² (Mathiesen 2002, 114).

³ (Aristoxenus, 134).

physics and mathematics as useful tools for understanding music; music, to Aristoxenus, can only be a science on its own terms.⁴

At the core of Aristoxenus's treatise is the notion of the tetrachord. The intervallic distances between notes in this tetrachord distinguish between the three genera of enharmonic, chromatic, and diatonic. Aristoxenus provides even further specificity when he goes on to describe different "shades" within these genera. Nevertheless, although Aristoxenus provides clear numerical distinctions between these shades and genera in terms of the "tone" as a measurement device, these distinctions are more boundaries than fixed locations upon some sort of rigid scale. The *lichanos*, for example, has an entire range of values, even within the same shade. Moreover, nowhere is the term "tone" given any sort of quantitative reference value. Thus when Aristoxenus discusses the *systemata*, which seem like the equivalents of scales, or the *tonoi*, which appear to act as modes filtered through specific boundary pitches, we must not try to map these categories too closely to modern notions of pitch since there appeared to have been a great degree of variability available to the practicing Greek musician.

Yet even though the writings of Aristoxenus lean much more heavily on the technical aspects of music making as compared to the works of the Pythagoreans, the modern music theorist is struck by the complete lack of reference to any specific musical practice or repertoire in *Elementa Harmonica*. Although it is possible that such sections of Aristoxenus's work are missing, the extent to which Aristoxenus is concerned with categorizing and labeling seems overwhelming. In Book 3, Aristoxenus laboriously lists ways in which tetrachords can and cannot be combined; yet never does Aristoxenus give an example in a musical excerpt. We can see, therefore, that the antithesis between speculative and practical traditions is somewhat relative to the time period in question.

⁴ (Barker 1984, 120).

Following Aristoxenus, music theory apparently underwent a long period during which historical documents fall predominantly into the speculative tradition. "*Musica*," as writings on music were known in the Roman era, existed to provide learned insights that could be "dropped in a speech at an appropriate moment."⁵ The study of music became aligned with the liberal arts, and although the number and categories of these liberal arts changed over the centuries, music – as the pseudo-Pythagorean study of harmony and ratios – seemed to always remain within each author's purview.

It was in Boethius, however, that this codification of music as a speculative study came to the fore in the early Middle Ages. As the study of "number in ratios and proportions," music was part of Boethius's *quadrivium* and thus a prerequisite to the study of philosophy.⁶ In what seems to have been an important yet misleading reformulization of Greek theory, Boethius develops two scale systems: one built on a set of disjunct tetrachords – the two-octave *systema teleion* – and the other on a set of conjunct tetrachords – the octave-plus-fourth *systema synemmenon*. As well, Boethius assigns to the pitches in these scales letter names, which, although basically unrelated to our modern letter system, set the stage for the notion that a single pitch in a collection could be given a "discrete symbol."⁷

In later developments during the Middle Ages, however, practical concerns bubbled up as music theorists attempted to merge this "harmonics" tradition of Boethius with the requirements of the liturgy. As the politics of Western Europe became unified under the Carolingian reign of the early 800s, the musical practices of the church became more unified as well. It was through this Renaissance (*renovatio*) that the *cantus* tradition saw its culmination in "the 'final shaping' of

⁵ (Bower 2002, 137).

⁶ (Bower 2002, 142).

⁷ (Bower 2002, 146).

the Gregorian chant dialect."⁸ Authors such as Aurelian of Réôme and Regino of Prüm both draw "heavily from the Platonic tradition of early *musica*," but they also incorporate a practical aspect through their mutual associations with tonaries. It is in their writing that the two traditions – *musica* and *cantus* – find the first Medieval expression of the "dichotomy" between speculative and practical approaches.⁹

At the same time as these early attempts at synthesis of the two traditions were appearing, developments in the art of music-making began spurring further developments in the realm of practical music theory. In particular, organal singing at the fourth and fifth began to become a means of elaborating the plainchants themselves. Theory thus begins to subtly yet importantly shift from not just categorizing melody but rather to discussing how this melody could be embellished and ornamented, thus paving the way for the study of counterpoint.

The *Musica* and *Scolica enchiridis* treatises provide the "earliest theoretical accounts of multi-voiced singing" and as such, stand as classic representatives of the practical tradition.¹⁰ Perhaps the most striking feature of the *enchiridis* texts is their method of scalar organization. Instead of orienting the pitch collection around octave periodicity, the *enchiridis* texts preference the interval of the fifth. The *enchiridis* scale system is composed identical tone-semitone-tone tetrachords stacked one on top of another in a disjunct ordering. With the lowest tone as G, the resulting pitches include a B-flat in the lowest tetrachord, a B-natural in the tetrachord a ninth above, and an F-sharp and C-sharp in even higher registers. At first, this lack of octave periodicity seems to defy logic, especially since octave equivalence is recognized to some extent in the *enchiridis* treatises through the notion of the "miraculous mutation."¹¹

⁸ (Cohen 2002, 308).

⁹ (Bower 2002, 152-3).

¹⁰ (Fuller 2002, 480).

¹¹ (Bower 2002, 157).

However, if we take into consideration the polyphonic practice as described in these treatises, the system makes more sense: organum at the perfect fifth above will always stay within the system. Organum at the perfect fourth becomes more theoretically problematic, though, and thus in many such circumstances, the organal voice ends up sustaining a boundary tone instead of consistently doubling the cantus.¹²

At the same time that the *enchiridias* treatises were near the peak of their popularity (circa late 9th century), Hucbald of Saint-Amand was also constructing a theoretical system that put the practical concerns of the *cantus* tradition at its center. Like the *enchiridias* treatises, Hucbald's *De harmonica institutione* lacks any reference to such speculative-theory staples as interval ratios and monochord division; instead, intervals and the scale "are taught empirically by means of concrete examples drawn from the plainchant melodies."¹³ As well, both Hucbald and the *enchiridias* texts offer the first examples of the notion of modal finals, thus foreshadowing the cadential functions that would orient and ground later contrapuntal theory.¹⁴

Yet for all these similarities, Hucbald's writings differ in significant ways from those of his contemporaries. Even though Hucbald does not deem it necessary to launch into a discussion of interval ratios, for example, he does import many concepts from the speculative tradition. Foremost of these appropriations is the diatonic Greek scale system as filtered through Boethius. Instead of the two separate scales of Boethius (GPS and LPS), however, Hucbald merges all the notes into one unified system – the GPS-plus-synemmenon scale – in which both the B-flat and B-natural appear within the same octave span.¹⁵ Unlike the *enchiridias* treatises, Hucbald recognizes the octave periodicity that is so central to Pythagorean theory, and thus Hucbald's

¹² (Fuller 2002, 481).

¹³ (Cohen 2002, 318).

¹⁴ (Cohen 2002, 322).

¹⁵ (Cohen 2002, 320).

scale is necessarily a combination of disjunct and conjunct tetrachords. Hucbald is still sensitive to the similar quality of different tetrachords, though, so he invokes the notion of *socialitas*, which is the earliest description of what would later be called "affinities" between modes.¹⁶ Therefore, we may summarize by saying that Hucbald prioritizes octave equivalence while recognizing tetrachordal equivalence, whereas the *enchiridis* treatises prioritize tetrachordal equivalence while recognizing octave equivalence.

Hucbald does spend some time discussing the various modes of both the authentic and plagal varieties in his writings, but it was in the *Alia musica* – a roughly contemporary work to Hucbald's – that the more commonly-known medieval categories of modes began to take shape. From the speculative tradition of Boethius, the *Alia musica* somewhat distortedly adopts the concept of octave species and their concomitant Greek ethnic names in an organizational scheme that much more closely matches our modern labeling system. Furthermore, the *Alia musica* divides these octave species "into their constituent perfect fourths and fifths as a means of distinguishing the authentic and plagal modes with the same final."¹⁷ This more clearly organized picture of the scale system thus opens the door for more consistent and cyclical divisions of the pitch space such as the later modal extensions of Glarean.

While these efforts during the late part of the first millennium were successful attempts at reconciling the practice of plainchant with aspects of the speculative work of the Greeks and Boethius, much work remained to be done with regard to the pedagogical viability of this theory. Near the turn of the millennium, a dramatic shift occurs where speculative theory becomes appropriated and reformulated as needed to the practical demands of teaching chant and the nascent art of polyphonic singing. An early and important representative in this shift is the

¹⁶ (Cohen 2002, 322).

¹⁷ (Cohen 2002, 337).

Dialogus de musica, formerly attributed to Odo. In the *Dialogus*, the unwieldy Greek note names are abandoned in favor of the letter names still used today; additionally, Hucbald's GPS-plus-synemmenon scale is presented not as the result of combinations of arbitrary tetrachords, but rather as a scale on its own terms – as simply a way of linearly dividing the useable pitch space via stepwise divisions.¹⁸

Perhaps this era's most famous example of putting speculative theory at the service of pedagogy and practice comes from Guido of Arezzo. Although historians are unsure of the exact extent of Guido's accomplishments, he is credited with inventing neumatic notation, the "Guidonian" hand, and the system of hexachords and mutations – precursors to the sight-singing techniques of solfege.¹⁹ In his *Micrologus* (c. 1026-28), Guido takes an approach that has strong ties to the *Dialogus* of Pseudo-Odo.²⁰ For example, the monochord – a symbol of the speculative tradition since the Pythagoreans – makes an appearance in both treatises; but instead of being used to describe purely-theoretical number ratios, these works treat the monochord as a tool to quickly and efficiently lay out the musical scale.²¹

Guido is also writing to address changes in the practice of organum, and thus another motivating factor behind his work is revealed. As seen in the *enchiridis* treatises, organum of the early middle ages operated mostly on the principle of parallel perfect intervals (*symphoniae*); the only exceptions seemed to be invoked in the attempt to avoid tritones or exceed a viable modal ambitus. In the musical examples from *Micrologus*, however, a new style appears – one that Guido calls smooth [*mollis*] instead of the hard [sounding] [*duris*] older method.²² These musical examples in *Micrologus* – all two-part "diaphony" – exhibit a much broader range of

¹⁸ (Cohen 2002, 340).

¹⁹ (Palisca 1978, 49).

²⁰ (Palisca 1978, 52).

²¹ (Guido, 60-61).

²² (Guido, 78)

intervallic combinations between the voices. Although the distance between the voices never exceeds a perfect fourth, the organal voice displays a certain amount of independence from the original voice. Most of this independence arises out of oblique motion since the organal voice often holds a pedal tone at or near the final; the overall effect, however, is that the second voice has been liberated from acting solely as an acoustical double to the first voice. Thus when Guido ranks the intervals according to their usability in this new style of organum, his focus becomes a precursor to the intense concentration that counterpoint treatises of the following centuries would adopt with respect to intervallic combinations.

The balance between speculative and practical traditions in music theory, of course, continues to redistribute its weight through the early stages of contrapuntal theory in the 1200s, 1300s, 1400s, and beyond. "Value-laden" hierarchies of intervals – classified as concords and discords – take on an academic, Boethius-like presentation using numerical ratios in an author such as John of Garland; in contrast, a more practical approach is shown in the "interval-succession instruction," by which catalogs of various contrapuntal motions are shown for each possible ascent or descent in the *cantus*.²³ Near the middle of the millennium, Tinctoris – the heavyweight of *contrapunctus* theory – seems as much intrigued by speculating as to all of the possible intervallic combinations as he is concerned with practical aspects of explaining the contrapuntal techniques of esteemed contemporary composers. As contrapuntal theory gets its feet wet in the history of music theory, therefore, we see that the strong partition between practice and speculation by which Aristoxenus separates himself from the Pythagoreans is instead a permeable division through which some of music theory's greatest ideas flow.

²³ (Fuller 2002, 486-7).

Bibliography

- Aristoxenus. c300 BCE. *Elementa Harmonica*. Translated by Andrew Barker. In *Greek Musical Writings*, Cambridge: Cambridge University Press, 1984.
- Barker, Andrew. 1984. Introduction to *Elementa Harmonica*, by Aristoxenus. In *Greek Musical Writings*, Cambridge: Cambridge University Press.
- Bower, Calvin M. 2002. "The transmission of ancient music theory into the Middle Ages." In *The Cambridge History of Western Music Theory*, ed. Thomas Christensen. Cambridge: Cambridge University Press.
- Cohen, David E. 2002. "Notes, scales, and modes in the earlier Middle Ages." In *The Cambridge History of Western Music Theory*, ed. Thomas Christensen. Cambridge: Cambridge University Press.
- Fuller, Sarah. 2002. "Organum - *discantus* - *contrapunctus* in the Middle Ages." In *The Cambridge History of Western Music Theory*, ed. Thomas Christensen. Cambridge: Cambridge University Press.
- Guido of Arezzo. c1026-28. *Micrologus*. Translated by Warren Babb, edited by Claude V. Palisca. In *Hucbald, Guido, and John on Music*. New Haven: Yale University Press, 1978.
- Mathiesen, Thomas J. 2002. "Greek music theory." In *The Cambridge History of Western Music Theory*, ed. Thomas Christensen. Cambridge: Cambridge University Press.
- Palisca, Claude V. 1978. Introduction to *Micrologus*. In *Hucbald, Guido, and John on Music*. New Haven: Yale University Press.