

1 Zarlino: Instituting Knowledge in the Time of Correspondences

To begin, a simple question of order. By way of preface to an interval taxonomy in Part 3 of his *Istitutioni harmoniche*, Gioseffo Zarlino writes, “Before discussing counterpoint it is necessary to know the elements of which it is composed. For one cannot order or compose anything, or understand (*conoscere*) the nature of the composite unless [one] knows first the things (*cose*) that must be ordered (*ordinare*) or combined, their nature (*la natura*), and their cause (*la loro ragione*).”¹ With explicit reference to causes and natures, the language here speaks directly to epistemological values of Aristotelian natural philosophy.² Such values lend methodological support to a fundamental distinction Zarlino observes between *musica prattica* and *musica speculativa*, of Platonic and Pythagorean provenance. Outlining a hierarchy that places “cause” and “nature” before musical composition, Zarlino’s intellectually hybrid pronouncement echoes an order of knowledge—*musica speculativa*—different from and ultimately superior to the particulars of composition and performance of *musica prattica*. The point here, however, is not so much that the passage above reinforces the hierarchy inherent in these categories and exemplified by the well-known distinction Zarlino makes between, on the one hand, *musico*, and, on the other, *cantore*.³ Rather, the point is that conjoined in their cause-and-effect relationship, *musica speculativa* and *musica prattica* are indivisible, as are, ideally, *musico* and *cantore*. Thus, when in Part 3 Zarlino introduces the intervals in the context of their suitability for composition, he cannot forgo the foundations provided by the “causes” and “natures” first presented in Part 1 of his monumental theoretical opus.

All this may seem to belabor the obvious: Parts 1 and 2 do provide the “foundations” for Parts 3 and 4, and so Zarlino would not forgo those foundations. However, it is not without significance that Zarlino should insist on issues he had repeatedly made earlier. His prolix style notwithstanding, the insistence here reflects methodological demands arising from Zarlino’s ambition to establish an indivisible musical truth. Indeed, his deft layering of various authorities in the passage above reflects consistent efforts throughout the *Istitutioni* to develop a hybrid methodology strong enough to support the congeries of aesthetic, compositional, historical, musical, poetic, rhetorical, and scientific pronouncements which constitute the “institutes” of Zarlino’s title. Pythagorean, Platonic, and Neoplatonic cosmology with its numerological and mathematical underpinnings is infused with Aristotelian natural philosophy in Part 1;⁴ in

Part 2 a sweeping account of ancient music (i.e., the Greek tonal system) is anchored to Pythagorean values deployed in the development of a theory of consonance that Zarlino sees as being distinctly modern; Part 3 moves into concerns of *musica prattica* proper, providing Zarlino's deservedly acclaimed and influential rules of contrapuntal practice, its elements and organization (with Willaert as a model, in the Ciceronian tradition); the materials of composition (the modes) are the subject of Part 4. In all, Zarlino's thought in the *Istitutioni* is characterized by an ambitious, all-encompassing conception of knowledge. At stake is the delicate balance he must maintain between the various cognitive pressures applied by the axiomatic dictates of Platonic and Pythagorean doctrine about the immanence and interconnectedness of all things, the explanatory method and ontological schemes of Aristotelian natural philosophy, and his recognition of indisputably changing aspects in the tonal system and style of modern music.⁵ His success depends then on the flexibility of his method to withstand these pressures and attend to the dual demands of the rationality of *musica scientia* (i.e., a domain the foundations and intelligibility of which can be systematically and undoubtedly demonstrated) and the accuracy of his historical exegesis and adaptation and/or transformation of ancient knowledge in the context of his day.

Understood as a rational procedure for discovering, understanding, and providing apodictic demonstrations of the relations among things, method is indeed of primary importance to Zarlino. To give one example, as it appears in the quotation above, "order" (*ordino*) designates the rational and systematic disposition of musical things in general, or as is the case there, of the intervals of counterpoint.⁶ But in a more fundamental way, "order" designates the predetermined condition in which things are given in the universe. It is the task of the *musicista* to comprehend methodically these things across all domains of knowledge, and that of the *cantore* to learn how to deploy them in an orderly manner in composition or performance proper. Or, returning to Aristotelian language, the sort of empirical knowledge of individual cases of musical composition or of the matter of intervals (*demonstratio quia*—the discovery of causes through their effects) must be grounded on the structuring demonstration *propter quid* of the effect by its cause or form, for only in this way could true rational knowledge be ensured.

The objective of this chapter is to present an outline of Zarlino's thought that will serve as a key point of reference to my discussion of Descartes in Chapter 2. In the present chapter I provide examples of various ways in which Zarlino endeavors to articulate a method for a universal knowledge of music, in particular, to which the post-Cartesian notion of a self-examining consciousness is wholly irrelevant. I consider selected strands of his thought as articulated in the book-ends of his music-theoretical career: the *Istitutioni harmoniche* (1558) and the *Sopplimenti musicali* (1588).⁷ Two issues are of particular interest: first, the epistemological protocol guiding the conception of order found throughout the *Istitutioni*, and second, the interrelation of this protocol to the more particular

sources that Zarlino deploys, appeals to, or invokes that would have made his thought possible and necessary, and that would have sanctioned it before his audience.⁸

In the first section of the chapter I describe, by appeal to passages from Parts 1 and 3 of the *Istitutioni*, what I call the epistemological saturation of Zarlino's thought. By epistemological saturation I mean two things: First, the idea that knowledge of "things," such as the intervals in the passage from Part 3 above, was informed by maximal and simultaneous associations and correspondences with other "things."⁹ Second, the methodology that responds to that idea by bringing together all available sources to bear on the subject of music, be it history, Scripture, Aristotelian natural philosophy, or Pythagorean mathematics and numerology. According to the first point, more than a linear series of progressive steps toward acquisition of knowledge, Zarlino mobilizes the associative and analogical thinking connected to the *signatura rerum* creed of Neoplatonic and Hermetic provenance. According to this creed, the seen and unseen world was etched with hidden inscriptions that made it legible, and thus intelligible, to the human intellect. The second point regards Zarlino's use of heterogeneous sources to build the foundation of the "harmonic institutes." Forming part of this general epistemological background, and yet in some sense moving against its grain, appears another key element of Zarlino's thought: the rational (i.e., as "ordered account") underpinnings of his *musica scientia*. For Zarlino, number ultimately provides the foundation for the intelligibility of music, while the demonstrations of mathematics guarantee the means by which to articulate knowledge of music with absolute definition. His cognitive faith in mathematics, however, must not be taken to reflect primarily a belief in method, for it refers most importantly to the idea that music, "[like] all things created by God, was ordered by Him with the number."¹⁰ Combined, these nested values—God, unity, number, music, mathematics—form part of and provide a conceptual framework for Zarlino's *musica scientia*. Fundamental to my analysis of epistemological saturation through this first section of the chapter will therefore be the recognition of a tension between the claims to knowledge of the epistemology based on associations and correspondences among things, on the one hand, and those of *musica scientia*, on the other.

In the chapter's second section I focus on a different tension: that between sound as number and sound as music. There I examine the impact of the introduction of subjective criteria for the classification of intervals to the overarching epistemology of correspondences. Also, I consider the persistence of associative thinking in the discussion of counterpoint proper. A final section introduces questions of method within the context of Zarlino's "modernity." Two issues are considered there: first, the influence on Zarlino's method of his teacher Adrian Willaert; second, the remapping of the cognitive relation with antiquity that Zarlino establishes in the *Sopplimenti musicali* (in response to the challenges of Vincenzo Galilei), which he conceives in terms different from those of the *Istitutioni*.¹¹

1.1. The Commitments of Knowledge

Chapter 1 of the *Istitutioni* opens in grand style, with what can justly be described as a dizzying account of the origins of music. “Hearing,” writes Zarlino, “will be recognized as far more necessary and better [than sight and smell] . . . in matters pertaining to the intellect,” a statement he follows with the stories of Jubal finding Cain’s people (*stirpe*), before the Deluge, by the sound of hammers, Mercury’s rediscovery of music afterwards, and Pythagoras’s discovery of the rationality (*ragione*) of the musical proportions.¹² Concluding his account, he discusses the status of music within the mathematical sciences (in the passage cited earlier), but not without connecting it to a Neoplatonic cosmology: “And such is the certainty of the said [mathematical] sciences that by means of numbers we can calculate with certainty the revolutions of the heavens, the various aspects of the planets, the lunar activities and its eclipse, and that of the sun, and infinite other wonderful secrets, without there being among them a discordant point. From this we know that music is both noble and most certain, being part of the mathematical sciences.”¹³

In its exuberant erudition Zarlino’s recounting appears to embrace a de rigueur protocol of learned writing, a received narrative formula that sought to connect a given writing to the authority of the ancients—keeping in mind that myth, written and oral record, and commentary on them could equally bear truth. Historical record upholds this impression. For instance, despite avowed efforts not to repeat what others have said in praise of music, Pietro Aaron goes on about the subject in a chapter longer than any other.¹⁴ Together there we find references to Homer, a host of Greek mythological figures, a recounting of the story of Orpheus, and so on. Even when pausing to reflect about whether there is real need for such accounts, Aaron cannot contain the force of received knowledge: “Timagenes affirms that of all literary studies, music is the oldest.” This is followed by other tales from Ovid about the affective power of music as well as by citations of classical loci from the *Timaeus* outlining the musical composition of the human soul, the macro- and microcosmos relation, and the musical interrelation between body and soul. Among other examples Aaron includes the restorative powers of music, music’s necessary place in grammar and architecture, and, according to Hierophilus, music’s effectiveness in “tempering ballistae, catapults, scorpions, and hydraulic machines.”¹⁵

True to this tradition, Zarlino too expounds at great length on the praises of music; next to the chapter on *musica mundana* (Chapter 6), Chapter 2, on the praises, is the most extensive in all of Part 1 of the *Istitutioni*. Like Aaron, Zarlino fails in his attempt at brevity. However, in contrast to Aaron, who from the outset invokes ancient authority, Zarlino begins with a statement of fact. Absolutely nothing can be found with which music does not have the greatest convenience (*grandissima convenienza*), he proclaims.¹⁶ Connecting music to all else, this preamble holds programmatic value, which prompts the question of what, beyond paying heed to narrative tradition, may lie behind Zarlino’s retell-

ing. As Gary Tomlinson, following anthropologist Marshall Sahlins, remarks, “[t]he precise *situation* of each *re-enactment* determines the character and significance of its events, and the particular character of these events determines the *transformational* power they bring to the structures they *re-present*.”¹⁷ It seems clear that in bringing the structures of knowledge of the preponderant Boethian and Neoplatonic traditions together with exacting claims about the certainty of mathematics and the immense depository of historical record, Zarlino’s re-presentation (or reenactment) of these various intellectual traditions has as one immediate transformative effect the suffusion of each of them with the other. By simple virtue of this assigned adjacency all these structures become somehow interconnected.

But the particular situation in which Zarlino carries out his reenactment no doubt entails more than a simple juxtaposition of various kinds of knowledge. This situation is such, in fact, that it calls upon a conception of order in which knowledge(s)—in reality, one thing among all other things—itself has the greatest convenience (*convenienza*). *Convenienza* is a notion with powerful cognitive associations of agreement, accord, conformity, fitness, harmony, propriety, symmetry, and suitability. In its Latin form *convenientia* is found particularly in Cicero, who reluctantly writes in *De Divinatione*: “I shall grant this very thing, if you like, although I shall have made a great sacrifice of my case, if I shall have granted that there is any *convenientia* of nature with [internal] organs.”¹⁸ Along with a host of expressions including, among others, *aemulatio*, *analogia*, *concordance*, *concurrence*, *conjunction*, *consonantia*, *harmonia*, *proportio*, *similitudo*, and *sympathy*, *convenienza* forms part of what Foucault, in a positive interpretation of the notion, calls “the semantic web of resemblance in the sixteenth century.” This semantic web designates a foundational tenet of Neoplatonic and Hermetic thought available to the Italian cinquecento intellectual: namely, the condition for existence that predetermines that all things are interconnected by correspondence.¹⁹ From a methodological perspective, the obvious question is how, in a world in which affinities connect music to all else, can anything be known about it that is not already known as part of this plethoric network of interrelationships? Put differently, if conceptual constraints may be said to keep things out of mind, and so conceptual expansions are necessary to bring things in, what would Zarlino’s intellectual task be if the conceptual framework available to him already encompassed all things? For our mid-cinquecento Venetian *musicista* there would have been nothing outside this framework, and so in a sense there would be no framework at all, no distinct vantage point from which to discriminate among things. Clearly, then, a fundamental task for the intellectual project of Zarlino’s “harmonic institutes” would have been to outline the chains of affinities or correspondences linking things, including the place in those chains for the music he deemed exemplary.

Correspondences, Foucault argues, were established by means of visible and invisible preexisting signs inherent in things. The procedure of establishing correspondences entails a process of discovery of these signs and their interpretation. Following Foucault’s analysis of such a process, I consider Zarlino’s intellec-

tual endeavor as having a twofold commitment to a semiology—the distinction of signs in their location, their constitution, and their links—and a hermeneutics—the interpretation of signs and the assignation of their meaning.²⁰ In the particular case of Zarlino, however, the semiological task of locating signs had already been carried out. Evidence of this is offered, for instance, in a passage from Part 1, Chapter 6, in which he cites sacred Scripture, Cicero, Plato, and a report about the inhabitants of the banks of the river Nile in connection to signs dispersed through heaven and earth that indicate Man's incapacity for perceiving disproportionate sound phenomena. Another example is a reference, in Chapter 12, to Augustine's *De Doctrina Christiana*, a locus classicus of scriptural exegesis with pronounced Hermetic influences. For Zarlino, on the other hand, the assembly and interpretation of this vast system of interconnected signs remained a fundamental necessity for his dual project of elaborating a *musica scientia* and demonstrating the validity of modern music. That he could be merely reassembling signs already interpreted is obvious, but such a reading would miss the importance of Zarlino's retelling as an interpretive act itself.

Consider his retelling, in Chapter 6, of *musica mundana*. Halfway through that chapter Zarlino defines *musica mundana* as "that harmony which is not only recognized to be among those things seen and known in the sky but also in the binding (*legamento*) of the elements, having been created by the grand architect God (as He also created all other things) in number, weight, and measure."²¹ By "things seen and known in the sky," Zarlino refers to the well-known doctrines of the music of the spheres and of universal harmony. Characteristically he precedes the definition above with an exhaustive enumeration of all the possible ways in which *musica mundana* is known: by the "revolutions," "distance," "parts," "aspect," "position," and "nature" of the individual planets. He remarks, for instance, that distances between the celestial spheres are not known by sense but by reason. "Reason," in his account, has a historical basis in previously established knowledge. Thus, Zarlino relates that according to Pythagoras the distance between the Earth and the Moon is at the interval of one tone, from the Moon to Mercury a major semitone, from Mercury to Venus a minor semitone, from Venus to the Sun one tone plus a minor semitone, from the Sun to the Earth diapente, between the Moon and the Sun a diatessaron, and so on.²² Regarding the "parts," he follows Ptolemy (*Harmonicorum Libri Tres*, Chapter 9), saying that the twelve signs of the zodiac correspond to the musical consonances. By contrast, regarding longitude, he states without citing a source that one discovers the diatonic, chromatic, and enharmonic genera, while in latitude one discovers the modes. Likewise, in the faces of the Moon are contained the tetrachordal conjunctions. According to their position, the spheres determine the virtues of people at birth and can, for instance, affect the elements themselves: if disproportionately positioned, Mars and Saturn can generate a universal pestilence in the world. This final reminder of the negative powers of astrological *convenientia* gives way, in Zarlino's retelling, to a systematic exposition of the numerical binds between the four elements (earth, air,

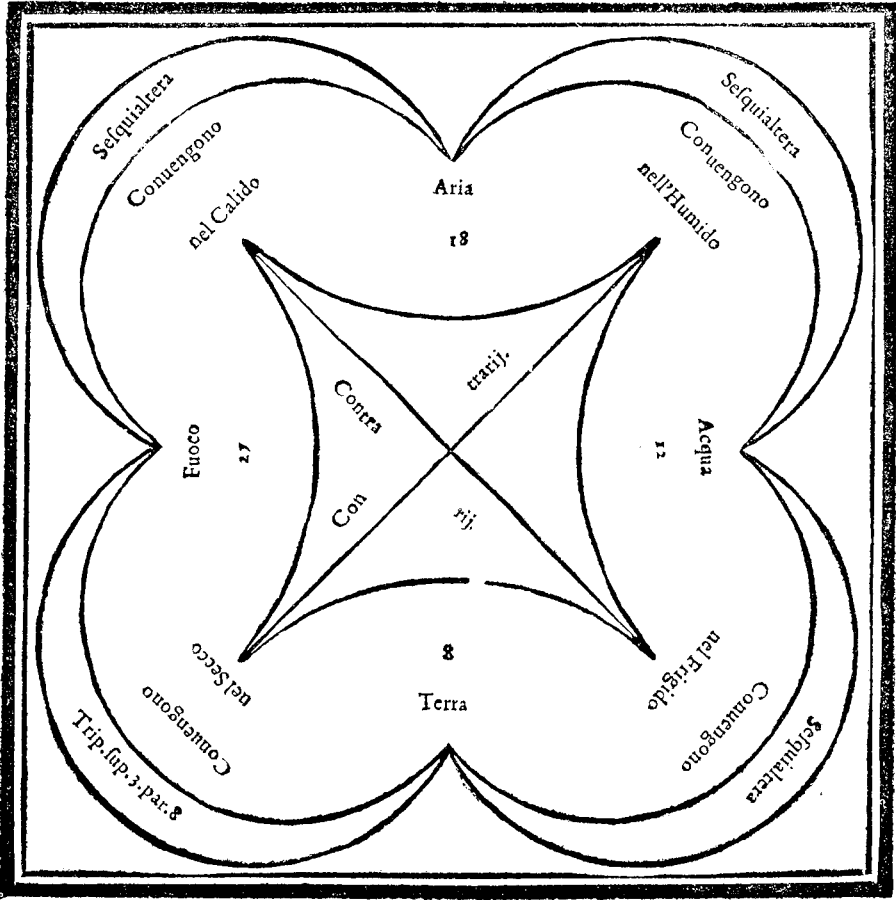
water, and fire) and their corresponding qualities (dryness, coldness, humidity, and warmth). “Number is discovered” in each of these, which enables a most extraordinary conjunction among them by means of medial elements:

As two square numbers come together in a medial proportional number, so similarly two of these elements are conjoined. Just as in the manner that the quaternario and the novenario square numbers come together in the senario (which surpasses the quaternario as it is surpassed by the novenario), likewise fire and water, which are two contrary qualities, are conjoined in one medial element; because fire being by its nature warm and dry, and water cold and humid, in the warm and humid air [they] are in perfect, great proportionate balance. . . . Thus they are united in such a wonderful order that there is no longer any disparity between them.²³

As shown in Example 1.1, Zarlino illustrates this series of conjunctions along a quasi-circular path enclosed within a square frame. Earth, in a foundational position at the “bottom” of the circle, holds a sesquialtera proportion to water, the next element in the path counterclockwise. The same proportion holds for water to air, and air to fire. Connecting fire and earth is the proportion triple superpartiens, which closes off the circle. Each proportion denotes a *convenientia* between adjacent elements, which is expressed in terms of a shared or mediating quality. Earth and water stand in a 2:3 proportion, equivalent to how they convene in coldness, for instance, which is the same as saying that coldness represents the *convenientia* existing between earth and water.

The scheme of transformations in Zarlino’s illustration manifests two principles: (1) all things (elements and their qualities, in this case) lie along an uninterrupted continuum; (2) in order for this continuum not to extend infinitely, it must circle back on itself. The first principle posits the existence of various kinds of correspondences distributed along a grid that conceptualizes “distance” between elements along the continuum. (This in itself denotes the primacy of “space” as the cognitive enclosure for knowledge.) The second principle reveals a peculiarity in the structure of the system: it is predetermined to repeat itself. Each of these principles must be examined in order to determine the norms according to which the knowledge of the correspondences among all things is established.

From Foucault we may borrow a taxonomy of correspondences, which he reduces to four: convenience (*convenientia*), emulation (*aemulatio*), analogy (*analogia*), and sympathy (*sympatia*).²⁴ First, there are correspondences among things sharing spatial proximity. This is “convenience.”²⁵ By it, adjacent (but not necessarily similar) things share a property which nature has predisposed as the site of their immanent correspondence. “Coldness,” “2:3,” and “diapente”: the signifying reach of each of these terms is not delimited by each of them being a *sign for* either a quality, a numerical account of parts of something, or a musical interval, in that order. Their signifying reach makes of these terms simultaneously *signs for* and *signs of* correspondences. With the expression “sign for” I shall



Example 1.1

Convenientiae between the four elements and the four qualities. Gioseffo Zarlino, *Istitutioni harmoniche* (1558: I, 14).

refer to a general equivalent to “word,” making a distinction between that expression and the expression “sign of,” which will express the idea of a correspondence between a thing and another.²⁶ That is, in addition to denoting a quality, parts of something, and an interval, within the *semiological* framework of correspondences, “coldness,” “2:3,” and “diapente” are *signs of* their proximity to one. By this account, “2:3” is a sign of “coldness,” for example. Further, “2:3” is itself a sign of a convenience believed to reside in superparticular numbers (i.e., contiguous numbers in a series).²⁷ Lest we think that this semiological framework encloses airy abstractions exclusively, Zarlino gives a concrete and crucial application of convenience in the ordering principle that intervals are more or less perfect according to their proximity to unity. In Part 3, Chapter 3, he ex-

plains that the diapason has almost the same nature as unity, being near (*vicino*) to it.²⁸

A second type of correspondence is “emulation,” which, further along the graded distances between correspondences, exists among nonadjacent things: water and fire in the figure above, for example. When Zarlino, in his illustration, positions air as a mediating element between water and fire, air emerges as a sign of a hidden correspondence between nonadjacent, in fact, opposite, elements. Emulation introduces a peculiar agency to the system: it implies a striving of one element in the correspondence toward another. This agency necessarily creates a hierarchy between the elements it associates. What does it mean for the harmony of things, then, that water should emulate fire, or fire emulate water? It is here that Aristotelian natural philosophy, as a kind of ontological lubricant, helps to harmonize discordant elements and attenuates the sense of assiduous striving that characterizes emulation. As discrete and contrary elements, fire and water are conceived with consideration of the Aristotelian distinction between essence and primary substance, on the one hand, and attribute and quality, on the other. Being attributes of a thing, changes in quality do not impinge on the essence of things—here, each of the elements—which remain unaltered.²⁹ In this way the fact that discordant elements hold a correspondence at all matters more than the particular direction the emulation may take (i.e., from a thing to another toward which it strives). As a result, air can be interpreted *qua* air, or it can be interpreted *qua* mediant signature of the correspondence between water and fire, which is the same as saying that “18” is a sign of the proportion between 12 and 27 (i.e., as 6 is a sign of proportion between 4 and 9) and that it points (as signature) to the inherent propinquity between these two numbers. Like convenience, emulation too is brought to bear on practice, in a classic contrapuntal formulation. The stipulation that the major sixth should proceed to the octave is predicated on the fact that “each thing seeks its own perfection,” in which the less perfect thing strives toward the more perfect. More specifically, Zarlino points out that the major sixth goes to the perfect octave and not the perfect fifth, which is literally “nearest to it” (more convenient), because between the major sixth and “the larger” of the perfect intervals there exists a “kinship or consensus” (*simbolo (dirò così) consenso*).³⁰ In this instance emulation trumps convenience, which Zarlino explains by remarking that “given a fact and a certain condition, I do not see how two diverse and almost opposite conclusions can be drawn from them.” His explanation gives an indication of the methodological distinction between *semiology* (i.e., the fact that these interval pairs simultaneously hold diverse types of correspondences, according to either proximity or absolute size) and *hermeneutics* (i.e., the fact that these correspondences are subject to interpretation).

Following emulation, the system opens itself up to a third type of correspondence, that between relations or parts of things: “analogy.”³¹ Simply put, an analogical correspondence that holds between two elements also holds for another pair. Analogy does not, however, constitute a systematic means for comparing measurements; it is, rather, an expression of the irrefutable proportion-

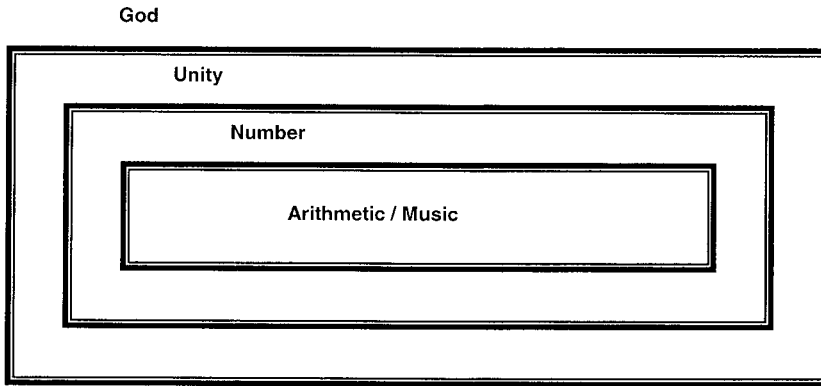
ality that inheres in all things and speaks to their basic numerical ontology.³² In turn, proportionality is not a matter of mathematical measurement, although mathematics serves to demonstrate the degree of proportionality as such.

The fourth and final correspondence is “sympathy.” It directs things to things through spatial movement. Here belong, for instance, qualitative changes and attraction: what is heavy is attracted to earth, what is light to air. “Fire,” Foucault gives as an example, “because it is warm and light rises up into the air, towards which its flames untiringly strive; but in doing so it loses its dryness (which made it akin to the earth) and so acquires humidity (which links it to water and air); it disappears therefore into light vapor, into blue smoke, into clouds: it has become air.”³³

By itself the system of correspondences would have a significant structural flaw. As I noted before, the system is totalizing, allowing nothing to escape its reach, which means that trapped in this “Epistemology of the Like” things could potentially lose their individuality. More damaging for Zarlino’s theory of consonance and dissonance, for example, would be that all things would have a correspondence in one way or another: thus dissonance would hold semiological privileges equal to those of consonance. Balancing the system, then, is a parallel network of opposites, which Foucault terms antipathies. Thanks to this virtual web of negatives, things are able to maintain a modicum of individuality. We ought to note, incidentally, that since by the tenets of Aristotelian natural philosophy upheld by Zarlino essential properties are permanent and individual, antipathies are not necessary. In Zarlino’s figure (Example 1.1), antipathies are expressed in terms of opposing *qualities* (e.g., dry is the contrary of humid). Nonetheless, as a whole, the elements, like the proportions to which they are analogous and the qualities that link them, are ultimately bound in a haven of correspondence where they coexist, uninterruptedly linked along a circular path.³⁴ Nothing, by account of correspondences, stands isolated, everything always already points toward something else. Thus, semiologically speaking, signs for things and signs of things are predestined to fold onto one another, and lie in wait for the hermeneuticist to interpret them, to speak on their behalf.

The second principle at work in Zarlino’s recount of the *musica mundana*, that of the circular structure of correspondences, raises two fundamental issues concerning signification. First, a question: how are these correspondences made into signs, how are they made to speak on behalf of the things they relate? Second, the possibility of any meaningful signification requires that the semiological motion circularly linking correspondences be arrested, and for this to happen there has to be an overriding hierarchy superimposed onto the correspondences, a metacorrespondence of sorts.

The first question goes to the heart of the sign’s structure in the system of correspondences: a *sign* for something *designates* that something by virtue of a conjuncture between signified and signifier that is given by a preexisting correspondence itself.³⁵ The sign therefore means insofar as it *indicates* (or is a *sign of*) a correspondence between the thing signified and another thing. Correspondences are, in other words, the third term in the structure of all signs. And, in



Example 1.2
Hierarchy among correspondences.

a semiotic (not semiological) sense, correspondences reside outside the things they conjoin. This is an important consideration, for it points to the fact that things cannot be fully known in and of themselves, which in turn is a consequence of the inseparability of knowledge from the ontological condition of all beings. To know something is to comment on its place(s) as correspondence.³⁶ Let us consider an example. “Diapente” is a sign of the correspondence in the proportion 3:2. The interval’s sound, its qualities as a stable and full (*piena*) concordance, and the “distance” between sounds of two large tones, one small whole tone and one large semitone apart, all form part of what is semiotically designated by “diapente,” being indeed expressions of that correspondence; but these semiotic designations (i.e., signifieds) do not perform a semiological function in the constitution of the sign “diapente.” That semiological function, which is the grounds for any possible interpretation, is given by the same proportion’s presence in linking Sun and Earth, to give but one example. Without this predetermination—itsself a semiotic echo of sorts—the sign “diapente” would hold little meaning.

Like an unending spiral ascending from the *convenientia* expressed by the adjacency between the numbers 2 and 3, through the analogy in the proportion 3:2, and all the way up to the sympathy attracting the Earth to the Sun, the system relentlessly sends all things into the uncertain wanderings of a semiotic “drift,” in Umberto Eco’s telling expression.³⁷ Against the potential aimlessness of this roving semiotics, there exists a superimposed set of what I will call absolute values, which like a parallel system of metacorrespondences arrests things in their drift through the infinite space of knowledge and simultaneously validates their signification within that space. (This is the second of the fundamental issues concerning signification in the system of correspondences.) The signifying validity of any and all correspondences is guaranteed by a nested set of hierarchies, indicated by the simple diagram shown in Example 1.2.

“[Il] grande Architetto Iddio,” Zarlino reports, designed everything with a concordance of number, weight, and measurement, creating an overarching structure, the unity and limits of which He guarantees and constitutes (the unframed area represents the infinite, a cognitive space beyond the reach of representation and human knowledge). This Divine Designer stands over all things as a transcendent Being, outside of all determination. At the first level is unity, that which, emanating from the Neoplatonic One, makes possible the interconnection of all things.³⁸ Number appears next.³⁹ In Part 1, Chapter 12 (“How necessary is number in things, and what is number, and if unity is number”),⁴⁰ number is said to be furnished by God to all things, including, most significantly, human reason and discourse (*ragione & discorso*). The instrumentality of number as index of certainty makes it a sine qua non condition of all that is said, that is, of all that discourse accounts for. Ranging from sacred Scripture to Augustinian doctrine and Pythagorean axioms, Zarlino’s account of number ultimately offers Euclid’s succinct definition: “number is a manifold composed of utmost unity.”⁴¹ Unity, Zarlino says after Boethius, is not number, however, but a condition of its possibility; more specifically, unity is the principle (*principio*) of number. Like a point, unity is indivisible, the beginning (*origine*), mother (*genitrice*), and measurement of all things, and yet it cannot be (onto) itself, lacking a middle and an end.⁴² At the next level in the illustration, as though emissaries from the quadrivium, are arithmetic and music, which Zarlino explicitly outlines in Chapter 20, entitled “The reason why music is said to be subaltern to arithmetic, and intermediate among mathematics and natural [sciences].”⁴³ Zarlino explains that music takes number and quantity as such from arithmetic, and measurable quantity (i.e., sonorous bodies) from geometry. These sciences depend upon principles known by natural light and cognitive sensation (*lume naturale* and *cognitione sensitiva*), such as the fact that the whole is larger than a part or that a line is length without width. Subaltern sciences, by contrast, “take” from the main ones primary elements, as perspective takes line from geometry, to which accidental elements are added. These added elements are unique to each of the subaltern sciences, such as visuality to perspective, for which visual line then becomes the exclusive subject. Likewise music has number as a common subject with arithmetic, to which it adjoins sound, making of sonorous numbers its proper subject. Zarlino writes that music *possesses* number (he does not say that music *takes* number from arithmetic) and that arithmetic is used for purposes of demonstration, which ensures true knowledge (*vera cognitione*) of its science. That music is only partially indebted to arithmetic is explained by the fact of their sharing the arithmetical principle of relationship, or proportion, which is used to indicate the passions (*passioni*) of the sonorous numbers. He further remarks that the conclusions obtained from the demonstrations of arithmetic are applied to sound or voice, which themselves are considered to belong to the natural science. From the natural sciences, sound derives “each modulation, consonance, harmony, and melody.”⁴⁴ Music, Zarlino concludes, is therefore subaltern to mathematics and

natural sciences, in support of which he refers to Avicenna (*Suffic. Liber, I, Chapter 8*) before offering the following, decidedly Aristotelian, disquisition:

And as with natural things nothing is perfect so as long as it remains *in potentia* but is perfect if reduced *in actu*, thus music cannot be perfect unless it is heard by means of natural or artificial instruments. This cannot be done with rhythm (*numero*) or voices alone but the one accompanying the other, particularly since rhythm is inseparable from consonance. By this it will be obvious that music cannot be said to be simply mathematical or simply natural, but rather part natural and part mathematical and consequently mid-way among them. But since the musician obtains the reason (*il musico ha la ragione*), in the area of consonance, from the natural science of music, which [reason] consists of sounds and voices, and the reason of music's form (that is, of its proportions) is drawn from the science of mathematics . . . we can reasonably say that music is a mathematical rather than a natural science: because form is more noble than matter.⁴⁵

The ontotheological doctrines that begin with Divine Unity give way in this passage to ontological questions that emerge once music is identified specifically in connection to science. Such ontological questions, associated here with the Aristotelian doctrine of hylomorphism (i.e., the doctrine according to which things are constituted of form and matter), are in turn subject to the logic of reason (*ragione*): “form,” which gives intelligibility to things, or more precisely, “that attribute by virtue of which anything is what it is, is comprehended by reason.” Matter, on the other hand, falls fully within the domain of sense.⁴⁶

In Zarlino's passage the seamless transition from Pythagorean and Neoplatonic structures to tenets of Aristotelian natural philosophy parallels a move from *scientia*—the generalized knowledge of Creation—to *musica scientia*.⁴⁷ This musical science, that is, emerges as questions of method become necessary to explain and, more importantly, rationally demonstrate music's place in the ontological continuum of all things “that are,” as he puts it in the following quote:

Thus those who came later showed the errors made by those of the past concerning our science of music (*scienza della Musica*) and, adding to it their own authority, made it so clear and certain that they numbered it amongst the mathematical sciences. For this [musical] science, together with the others [mathematical sciences], advances the other sciences in certainty and is a fundamental truth. This fact can be recognized from its name: since mathematics is from the Greek word μάθημα (*mathêma*), which in Latin means discipline, and in [our] Italian means science or wisdom, which—as Boethius says—is none other than a means of understanding or, to put it more clearly, the capacity of things that are [to demonstrate] Truth—things which, by their nature cannot be changed.⁴⁸

As part of the many commitments of knowledge, *musica scientia* reflects Zarlino's urgent concern with the individuality of truth: its uniqueness and absolute indivisibility.⁴⁹ This concern is dictated by the given order of things and their internal constitution, and it also informs the method by which he accounts

for them. As we proceed in the next section to discussion of the structure of the *numero sonoro* and Zarlino's famous advocacy of the *numero Senario* as the matrix for musical order, we find that his institute could have been established on no other foundation than that constituted by the holistic amalgam of correspondences and number, to which the all-encompassing Aristotelian division of form and matter serves as explanatory matrix. We will consider, however, the degree to which the many commitments of knowledge force Zarlino into making strategic cognitive compromises as he approaches the particulars of *musica prattica*.

1.2. Sounding Number and Musical Sound

The importance of Zarlino's musical elaboration of the *numero Senario* is widely acknowledged and amply documented, needing no extended rehearsal.⁵⁰ It suffices to note that based on the foundational tenet of the *numero sonoro*, Zarlino audaciously rationalizes the expansion in the range of consonances sanctioned by Pythagorean doctrine, disseminated by Boethius, and upheld by music theorists up to Gaffurio.⁵¹ This expansion is generally understood, from a musico-practical perspective, as a necessity in accounting for the irrefutable preponderance of thirds and sixths, firmly established intervals in counterpoint and recognized prior to Zarlino by Gaffurio himself (who considered them irrational, nonetheless), as well as by Lodovico Fogliano (*Musica theorica*, 1529), Bartolomé Ramos de Pareja (*Musica practica*, 1482), and Ramos's student Giovanni Spataro (*Errori di Franchino Gafurio da Lodi*, 1521).

Zarlino's rationalization is underwritten by Pythagorean numerological doctrine; departing from number and from the notions that numerical relationships speak most intelligibly in the language of proportions and that musical intervals hold a numerical rapport, the *senario* is advanced to a cognitive position along the coordinates delineated by that doctrine. Thus, in Part 1 of the *Istitutioni* the *senario* is first situated within an exhaustive taxonomy of species of numbers (e.g., simple, compound, pair, odd, prime, cubic), among which it is securely enconced within the genus of "perfect numbers." Perfect numbers are constituted by their parts; since 6 is constituted by 1, 2, and 3, these parts can be added or multiplied, resulting in the *senario*.⁵²

Two issues merit consideration here. First, the *senario* is given as part of a general taxonomy of numbers determined according to a particular conception of order. Second, as an expansion of tenets upheld by tradition, the *senario* cannot be sustained by appeals to musical practice alone. The question of taxonomy is pertinent. Strictly speaking, Zarlino works from a general, albeit virtual, table where all known relationships that inhere to number reside and from which he carves out a series of relationships that apply to the *senario*. But unlike his summaries of other types of relationships held by the *senario*, which take the form of tables or figures (e.g., the *senario*'s "properties" in Chapter 15), his opening gesture here simply strings together similarity relationships as evidence of the *senario*'s special place in the order of things. This, of course, attests to the "Epi-

temology of the Like” that guides the correspondences in his account of *musica mundana*. It is to this overarching epistemology that he turns in his efforts to buffer the impact of his expansion of the Pythagorean canon (the second of the issues I note above). Indeed, Zarlino goes to considerable lengths to infuse his arithmetico-mathematical discourse with the plethoric discourse of correspondences. Thus, in Chapter 13, after he has introduced the senario from a numerological perspective, Zarlino promptly slips into theological testimonial:

Since, in His activities, God had never needed time, the great prophet Moses, in describing the great and wonderful fabric of the world, chose the number senario. So, like the one who was a complete master of every science, knowing harmony through the Holy Spirit—harmony which was contained within such a number; and which from visible things we know the invisible things of God—[that is] His omnipotence and His divinity—Moses turned to explaining and demonstrating the perfection of God’s works by means of this number—the harmony contained within them, the custodian of its own being, without which nothing could last; but over all, either it would cancel itself out; or, if things truly returned to their original essence . . . the confusion of ancient chaos would once more be seen.⁵³

However briefly, this account reaffirms the hierarchical structure of knowledge outlined in Example 1.2. But also introduced here is a fundamental cognitive (or, more properly, semiological) distinction: that between visible and invisible signs. In that which is apparently visible, we can know the invisibility of God, he states, which no doubt fuels the tour de force of correspondences that Zarlino elaborates in the next chapter (14), titled “That in the senario are comprised many things in nature and art.”⁵⁴ The oft-quoted list he gives is comprehensive and worth recounting. Out of twelve signs of the zodiac, six are seen on the hemisphere at a given time; six the planets holding forth in that zodiac; six the circles in the sky; six substantial qualities in the elements; six the *uffici naturali*, without which nothing can be (size, color, figure, interval, state, and movement); six the species of movement; six the differences of position; six lines in the triangular pyramid; six faces to the cube; six the equilateral triangles contained in the circle (which demonstrates its perfection); six the times that a circumference needs to be traversed in order to be measured (from which the name *sesto* is given to the measuring instrument); six the degrees of man (essence, life, movement, sense, memory, and intellect); six the stages of man; and six the stages of the world (Zarlino corrects Lactantius Firmianus, who mistakenly misinterprets that sign to mean that the world would last six thousand years); six the transcendentals (entity, oneself, true, good, something, and thing); six the logical modes of propositions (true, false, possible, impossible, necessary, and contingent). Not only that, poets end their most perfect verses on the sixth foot, and, as Plato relates, Orpheus declared that the hymns must celebrate no generation beyond the sixth, since he thought that it would not be possible to sing about any other things than those in creation. “It is no wonder then,” Zarlino tellingly writes, “that some have called the senario sign of the world (*Segnacolo del mondo*),”⁵⁵ for just as there is nothing superfluous in this

world, the *senario* has such temperament that it can be neither extended nor contracted; this makes it not only perfect but also an emulation of virtue itself.⁵⁶ But then, as a kind of transition from this disquisition on the preponderance of the *senario* in nature, Zarlino returns to numerological properties: the *senario* is said to be analogous or proportional, given the manner in which it reunites its components, and it is circular, given that it is a multiple of these components. Nature, he concludes, has enclosed many things in the *senario*, and so it must be the case that things found in music too must be saturated with this sign. Indeed, six are the species of voice (Unisone, Equisone, Consone, Emmele, Dissone, and Ecmele); six those which are called consonances (Diapason, Diapente, Diatessaron, Ditono, Semiditono, and Unisono); six the species of harmony (Doria, Frigia, Lidia, Mistalidia, Eolia, Ionica). “It would be too long to recount one by one all those things that end in the *senario*,” Zarlino remarks, opting to discuss its properties in a separate chapter.

Zarlino’s exhaustive detailing of the omnipresence of the *senario* in Chapter 14 obeys a complex but strategic order of telling. Beginning with things “superior,” Zarlino first introduces correspondences in a Nature that, although superlunar, is nonetheless evident and undeniably accountable; literally: the signs of the zodiac, the planets, and the way in which these mark the rhythm of time here on earth. Moving to matters articulated in the philosophical tradition (i.e., Platonic and Aristotelian accounts of position, elements, qualities, etc.), Zarlino then brings his outline to the level of “man”—an anthropological level, we might say—when describing, for instance, the way in which the *senario* maps the stages of our own existence. Ethical matters follow, which further implicate “man” in the *senario*, before Zarlino unexpectedly turns to art, that is, to the presence of the *senario* in poetry and song, the artifices of “man.” (Throughout the chapter Zarlino intermittently issues brief apologies for not really wanting to go on too long on any matter.) His transition to discussion of the *senario* in music is particularly shrewd: by zeroing in on internal properties of the *senario* (i.e., its being analogous and circular) he establishes unassailable proof of its privileged “formal” status (i.e., its relation to *forma*). In making this move Zarlino penetrates the innermost core of knowledge and method: mathematics, the science of intelligibility. That from here he quickly turns to music—where he dwells all too briefly—suggests that all the correspondences accumulated throughout the chapter coalesce in support of music, not only ontologically, but epistemologically as well.

Throughout Part 1 Zarlino is intent on grounding knowledge on formal terms, which is a logical (i.e., orderly) procedure insofar as he observes the Aristotelian division of form and matter. As proportional relations the consonances are given, in a formal sense, in the *senario*, and it is these relations which render each consonance intelligible. Intelligibility is doubly associated with the necessary order that attends to things in the world and to our consequent cognitive access to them. The structural priority given to form guarantees, in a way, that its counterpart, matter, be brought into the fold of cognition. Thus, in the famous case of the minor sixth (minor hexachord), Zarlino makes an extraordi-

nary appeal to the actual/potential scheme of Aristotelian ontology, bringing to bear on intelligibility notions that fundamentally pertain to matter (*materia*). The minor sixth is given in the proportion 8:6:5 and so is not found within the senario *in actu*. It is found nonetheless, claims Zarlino, “*in potentia*.”⁵⁷ Its *forma* is given potentially in its individual parts (the perfect fourth [*diatessarón*] and the minor third [*semiditono*]), which, being contained in the senario, guarantee then the intelligibility of this “compound” interval. Here, as elsewhere, Zarlino does not fret about the inconsistency of his argument.⁵⁸ In fact, upon closer examination one has to wonder if to his mind there is an inconsistency at all. If, as I have noted, the Aristotelian hylomorphic doctrine dictates the structure of things, then there is logical and sufficient reason for Zarlino to observe the actual/potential scheme. For a committed Aristotelian, it is simply a matter of sliding further along the ontological continuum: at the level of form, even that which already is may yet be transformed. Discrepant as the methodological criteria Zarlino invokes may be, such inconsistency simply cannot overrule the ontological consistency that founds the overall scheme. By this account “being” trumps method. In the end this example illustrates his sensitivity toward the various conceptual pressures operating within his hybrid epistemology, as well as his ability to maneuver within the strictures of method to create room for the vicissitudes of *musica prattica*.

Such ability is put to a greater test when Zarlino moves, in Part 3, to a discussion of counterpoint, addressing more directly questions of matter, that is, of musical sound. At the outset of this chapter I discussed how in his introduction to the intervals in Chapter 3 he brings to bear at once the whole of his cognitive apparatus. As he proceeds further in that chapter, the primary criterion for interval classification is essentially “convenient”: intervals are classified according to their proximity to unity:

[A]s the number 2 has almost the same nature as the unity, so does the diapason have almost the same nature as the unison, whether because it is near (*vicino*) to it, as can be seen in the terms of their ratios, or because the terms of their proportions are not composed of numbers other than unity. Thus the effect resembles the nature of the cause. If harmonic numbers are the cause of harmonic sounds, and these sounds imitate the nature of the numbers, it is logical that the two sounds of the diapason should appear as one sound only.⁵⁹

In addition to the Aristotelian language of causes found at the outset, the writing here invokes the semiology of correspondences to further cement the numerical foundation of intervals. That is to say, like numbers, sounds too are related by their *convenientia* along a spatially conceived hinge (Zarlino writes of numbers as being “neighbors”) so that 2 and 1 hinge around their contiguity in a series. And since all things obey a hierarchical arrangement along the chain of correspondences, sounds too strive toward (i.e., emulate) their cause. In this case, for the emulation to occur it does not suffice that cause and effect bind things together; beyond that, the cause must be ascribed an agency (i.e., the will to imitate), essential to maintaining the hierarchy of form over matter. Thus,

when Zarlino concludes that “it is logical that the two sounds of the diapason should appear as one,” the expression “logical” (*ragionevole*) designates the multiple rational accountability of correspondences, causal relationships, and formal intelligibility.

As Zarlino turns to discussion of intervals lying farther from their cause (i.e., thirds and sixths), different ordering criteria enter the picture. “Consonances,” he says, “are the more pleasing as they depart from simplicity, which does not delight our senses much, and when they are accompanied by other consonances, because our senses prefer composite to simple things.”⁶⁰ Zarlino pursues now a comparison between the senses of hearing (*l’Udito*) and seeing (*il Vedere*), both of which prefer composite things. There is no direct evidence that Zarlino may be alluding, in his comparison, to the understanding of sense perception available to him, such as Aristotle’s in *De Anima* (which he cites elsewhere in the *Istitutioni*). Different from most of his earlier comments, that is, Zarlino cites no cognitive authority in support of this view, which suggests that his comparison of the two senses is a simple analogy. But the significance of the analogy lies, I believe, in the very fact that the judgment of the senses is invoked at all. For although sense perception constitutes the acknowledged aesthetic arbiter in other domains (e.g., visual perspective), the notion of sense perception and the concomitant figure of the perceiver are hardly featured up to this point of the *Istitutioni*.⁶¹ There is no conception of a “listener” as a discrete cognitive locus separate from objects of perception, and therefore no methodological need for Zarlino to justify this perceiver on epistemological terms. Introducing sense and perceiver at this stage, however, neither alters the basic *modus operandi* of the treatise nor indicates some sort of conceptual instability on the part of Zarlino. In keeping with the plethoric cognitive disposition of the treatise, the presence of a new authority (i.e., “the listener”), no matter how attenuated it may be (as is the present case), joins all other authorities without preconditions or even so much as a comment. Thus, expressions such as “sweet” or “languid” sounds, ascribed to the finals in modes 1–4, 9, and 10 (in Glarean’s numbering), are conjoined with statements to the fact that in these finals “the consonances [are] arranged contrary to the nature of the sonorous number” (i.e., the fifth is arithmetically divided, as opposed to the harmonically divided fifth in the other modes). And while Zarlino precludes this by establishing an aesthetic correlation between sense and consonances arranged according to the location of the sonorous numbers in their natural positions, because sense appreciates proportionate things, the musical status of the “disproportionate” is, in the case of the minor finals, in no way diminished. There are, in fact, two distinct notions at play here that share, in the principle of proportionality, a conceptual hinge. First, we find the methodical, orderly measurement of the relation between parts of things, which is the primary use of “proportion” throughout the *Istitutioni*. Second, we find: (1) the doctrine of *propriety*: the perfect correlation between one sense and one kind of object, such as sound to hearing (Zarlino calls this a “particular sensible” [*proprio sensibile*], after Aristotle),⁶² and (2) the demand for a proportionality between sense and “common sense-objects” (i.e., objects affect-

ing several senses such as movement, shape, and size). Of the latter, Zarlino states that “the more proportional such objects are to their proper sense, the more satisfying and smooth they are,” adding, in a comment borrowed from Aristotle’s *De Anima* and later to be loudly echoed by Descartes, that “the eye is hurt by looking at the sun, because the sun is not proportioned to it.”⁶³ It should come as no surprise that the word *convenienza*, which I have suggested makes a programmatic appearance early in Part 1, means also “propriety,”⁶⁴ situating the aesthetic relation to sound squarely within the web of correspondences.

As musical phenomena, intervals are given to sense by virtue of their privileged status in the order of things, an ontological ground that quite simply does not require the *musicus* to focus on questions of sense perception, physico-acoustic structure, or empirical observation. For an orthodox Aristotelian, it would seem odd, at the very least, not to attend to the latter, but not to Zarlino, for whom the Philosopher constituted one authority among many. Musical intervals form part of a total mode of being, known through various cognitive registers but ultimately attendant to the embedding structure of knowledge of correspondences. And within that structure Zarlino more than demonstrates how flexible his methodology can be, as his brief foray into matters of perception indicates. Such an attitude plays a greater strategic role in the *Istitutioni* the more that Zarlino encroaches into the domain of musical practice.

1.3. Redefining the Aims of Theory: *The Sopplimenti*

In Part 3 the principal aim of the *musicus* is stated in clear and precise Horatian terms: “to amuse and benefit” (*delectare et prodesse*).⁶⁵ This is achieved in practice, Zarlino explains, by adhering to the well-known series of prescriptive maxims given in Chapter 26: the musician must have a subject (*Soggetto*); compositions must contain mainly consonances and incidentally dissonances; voices must proceed through the intervals dictated by the sonorous numbers; there must be variety in the movement of parts and harmony; composition must be ordered around a determinate mode; the music must complement the text.⁶⁶ Underlying the aesthetic demand for variety, a “pleasure principle” (as we may term the part of the Horatian maxim that he emphasizes at this stage) weighs heavily in his disquisition. Ancient composers disallowed successions of two perfect consonances, Zarlino observes, because they knew all too well (*molto ben sapevano*) that harmony requires things that are diverse, discordant, and contrary to each other rather than alike in every way.⁶⁷ His appeal here to the faceless voice of ancient authority does not appear, however, to ground sufficiently this widely accepted contrapuntal stricture, for in an effort to anchor more firmly compositional rule he then brings “Nature” herself to bear on the issue. The ancients, Zarlino notes, observed this particular rule confirming how true and good are the workings of wondrous nature, which

does not produce identical individuals in a species but always somehow varied.⁶⁸ From this he concludes that “every composer ought to imitate the beautiful order of nature, and he will be considered excellent in proportion to the resemblance of his procedure to those of nature. . . . So we must not write consecutive unisons, octaves, or fifths, for the natural cause of consonance—the harmonic number—does not contain in its progression or natural order two consecutive similar proportions.”⁶⁹ Conveniently (and I mean this literally in the sense of Zarlino’s use of the word) interconnected in Chapter 29 are history, nature, and a rational account of mathematics. Together, these various strands of knowledge help subtend the imperative principle of imitation, as well as to promote through “emulation” the predetermined correspondence of art and nature. For in the end it is Zarlino’s injunction to the modern-day composer to emulate nature—and with it all that nature stands alongside in the unbroken continuum of all things (history, *scientia*, etc.)—which fuels the engagement of the *Istitutioni* with *musica prattica*.

Zarlino’s injunction to modern composers suggests an avenue for a critical understanding of the *Istitutioni*, namely, that the question of methodology in Zarlino is mutually implicated in his notion of a mid-cinquecento Venetian “modernity.” As is amply known, in Zarlino’s program that modernity is embodied in the musical aesthetic of Willaert, and by the civil, ethical, moral, and spiritual values that it represents. We may conceive of Willaert as playing a dual role in Zarlino’s program. In the first place, as Martha Feldman has pointed out, Willaert constitutes the figure of the Ciceronian model, an identifiable and culturally revered foundational locus for the “harmonic institutes.”⁷⁰ In the second place, within the unfolding of history (understood here in a basic sense as the passage of time), Willaert is a redemptive figure, who, Zarlino thought, would restore to music “the honor and dignity it formerly had” in the time of the ancients.⁷¹ Indeed, Willaert’s music might demonstrate modern music’s universality. Reaching back to music’s origins, to historical and mythological record, and to the nature of all things intelligible constitutes, to my mind, a most ambitious attempt by Zarlino to situate the “now” of Willaert’s figure (and his own Venetian present) within the “ever,” seamlessly infusing the present with the past and, one might well imagine, projecting its survival into the future as well. This desire for universality suggests that, along with the traditional interpretation of the *Istitutioni* as an encyclopedic synthesis of “a vast literature on music, philosophy, theology, mathematics and classical history and literature,”⁷² the manner in which Zarlino accomplishes such “synthesis” might also be profitably understood as *bricolage*. Like Lévi-Strauss’s *bricoleur*, Zarlino deftly cobbles together heterogeneous sources that hold prior meanings, rearranges them in novel combinations which give the unified notions of modern music’s naturalness and universality a mythical character.⁷³ Indeed, this practice of discourse construction—which in Lévi-Strauss’s formulation is characteristic of processes of mythical thought—would resonate with an actual mythology built around Venetian self-identity and Willaert’s representation of it.⁷⁴

Thus viewed, the aims of the “harmonic institutes” become ideological, in-

vesting, under criteria of objectivity and rationality, a particular musical practice with mythical values of immanence and universality. Ideology in this case is decidedly active, for Zarlino's *bricolage* both advances an operative strategy and injects a particular structural design into musical practice. By operative strategy I mean that the *Istitutioni* represents a field of action, calling into order the music making of Venice from the author's privileged position as pupil of Willaert and, at the time of the first publication of the *Istitutioni* in 1558, his potential successor at San Marco.⁷⁵ Musical action is meant also in a practical sense to benefit its listeners, in accordance with Horace's maxim. And to convey the benefit of virtue, music must itself be virtuous, as must be the beneficiary. This beneficiary is Zarlino's ideal listener, whom he identifies as a "well-disposed Subject" (*Soggetto ben disposto*), one capable of appropriately receiving a particular emotion.⁷⁶ The import of this active commitment is one we might call sociopolitical and relates to the nexus between knowledge and order, of which musical discourse and music making in Venice formed part.⁷⁷ To have any legitimacy, Zarlino's ideas about (Venetian) music had to convey the authority and *gravitas* associated with a unitary and convenient Nature and had to carry the imprimatur of reason. This is why music and the structure of its sounding matter needed to be suffused with the rationality of nature, which is what I call "injecting a particular structural design into musical practice" above. It is in the service of this structural design, then, that the Aristotelian model of form and matter constitutes a disciplinary *sine qua non* of the *Istitutioni*. For without that direct and unquestionable cognitive structure the inseparability of intelligibility (*forma, ragione*) and sense (i.e., sounding matter) could not have been articulated. It is not the case that "Zarlino took a step backwards by reinstating the dominance of *ratio* over *sensus*."⁷⁸ Apart from its uncritical deployment of a notion of cognitive progress, this remark fails to consider the rich dialectic between *forma* and *materia* within which Zarlino's thought shuttles back and forth, and thanks to which sound is made part of a larger ideological complex.

The ideological in Zarlino folds back onto an idea I have previously alluded to, namely, his efforts to preserve the sanctity of a unique and indivisible truth. For such efforts, I believe, make of the *Istitutioni* a costly enterprise, one whose construction and upkeep demands unrelenting epistemological anchoring, as my discussion of the many commitments of Zarlino's methodology indicates. How much tension these demands must have caused can be gleaned from the tumultuous developments that followed reception of the *Istitutioni*. For instance, work by Vincenzo Galilei (a disciple) questioned his teacher's understanding and representation of Greek theory, debunked the notion that the ratios determining musical consonance had to be confined to the senario, and demonstrated anomalies in the Ptolemaic tuning Zarlino advocated.⁷⁹ Also, Giovanni Battista Benedetti's acoustical experiments on sound production were carried out in physical terms and looked away from numerology as a source of rational explanations.⁸⁰ Taken together, these criticisms would indeed have exposed fault lines in the foundations of Zarlino's thought. His advocacy of

a tuning system that corresponded to the perfect sonorous numbers of the scenario, for example, was grounded in his unwavering faith in the Pythagorean ontology of sounding number. But also, because no element—be it sacred Scripture, mathematical demonstration, or the story of Pythagoras’s discovery of the proportions—was deemed ancillary to the edifice of knowledge, any questions raised about his historical interpretation would have implicated the *Istitutioni*’s entire intellectual apparatus, to say nothing of the ethical and social agendas it embraced.

Aware of the potentially devastating consequences of his critics’ gains (Galilei’s in particular), Zarlino attempted to defuse their impact by allowing for a distinction between history and method in his *Sopplimenti musicali*, published in 1588, two years before his death.⁸¹ Zarlino preambles this distinction by restating a long-held difference between art and science. “The truth,” he says, echoing his position in the *Istitutioni*, “is that the forms of consonance and other intervals used in our time in vocal and natural composition (*cantilene*) are neither things of art nor invention of Man; rather, they are firstly produced out of Nature herself, and are positioned and registered among many things, specially in the parts of the first perfect number.”⁸² To pursue these natural correspondences between music and nature is science’s task, while art has as its function to organize music from among the intervals found in nature, specifically in the species called “natural” or “syntonic diatonic.” At first this division does little to defend Zarlino from his detractors, simply echoing the epistemological hierarchy observed throughout the *Istitutioni*. But then he draws a new distinction, between two kinds of art. When writing and thinking of practical matters, he reminds readers, his aim has always been to “teach the manner of composing that is upheld nowadays and to show the diversity of modes, not according to the customs of the ancients . . . but according to the use of the moderns.”⁸³ The question of modernity could hardly be made in more certain terms than these: “It was never, nor is it now my intention to write about the use of practice in the manner of the ancients, whether the Greek or Latin . . . but only about the method of those who have found our manner (*questa nostra maniera*) of making many parts sing together with diverse modulations and airs, specially in the way and manner of Adrian Willaert . . . my teacher in practical matters.”⁸⁴ And while for Zarlino modern polyphony achieves a triumph of sorts over ancient music, he now has to confront the real possibility of a divided history, or what would be the same for him, the devastating consequences of a divided truth.⁸⁵

Zarlino’s solution is deceptively simple: to reorganize the field of musical knowledge. This is achieved by defining anew cognitive criteria on the basis of “kind” of knowledge and “means” of acquisition. “Perfect knowledge of music is acquired from two parts, one of which we will call historic and the other methodic,” he now proposes.⁸⁶ “Historic” knowledge counsels that musicians and composers follow appropriate authors on matters related to art and science and explain and declare what the ancients have written (on this, Zarlino cites Quintilian, *Institutio Oratoria*, Chapter 4). Further, Zarlino explains, historic

knowledge has a dual cognitive endeavor: while “history” consists in the narration of all things memorable made in antiquity and the record of all the centuries, “exegesis” consists in the expository commentary on that record. Demanding “reason and proper method” (*ragione & buono methodo*), “methodic” knowledge subsumes all aspects of music, from composition to rational comprehension of its forms, art, and science. In essence, Zarlino’s “methodic” knowledge pours into a single cognitive container the contents of the various epistemologies brought together in the *Istitutioni*.

Transparent though Zarlino’s reorganization may appear to us, to his thinking its veil must have managed to protect sufficiently the notion of a unitary truth. Truth continues to reside in the indivisible ontology of sounding number. Truth also remains beholden to a holistic epistemology that bridges form and matter, nature and artifice. Erudition, formerly part of the continuum of knowledge, has been compartmentalized and has been transformed into evidence of truth, if and when appropriate. The present, Zarlino’s division suggests, not only holds the past under watchful eye, it also lends it a voice through exegesis and commentary. And he does provide extended explanations of ancient knowledge, assigning individual chapters in the *Sopplimenti* to Archytas, Ptolemy, Aristotle, Theophrastus, Panaetius, Plutarch, and Porphyry. But in the end Zarlino reads the ancients in order to demonstrate the immanence of the present’s values, and ultimately to affirm its superiority over the past. Further, Zarlino’s conception of “method” in the *Sopplimenti* preserves the ontotheological commitments of the *Istitutioni*. Method corresponds to “knowledge” (*cognitione*), but in a sense different from and ultimately secondary to “wisdom” (*sapienza*). Together with prudence, Zarlino had written in the *Istitutioni*, wisdom was divinely furnished to man so that he could find knowledge in number.⁸⁷ Were Zarlino to yield to the pressure of his critics, he would have to admit that it is possible to know things outside of the framework of correspondences, which would indeed sever the relation of sound to number and extricate it from the continuum of things. But that, he would have said, would be neither prudent nor wise.

Zarlino’s crisis is the symptom of a modernity caught in a paradoxical simultaneity of eternal immanence and change. Something had to give, for no matter how much the Pythagorean ethos and its transcendental verities may have governed the harmoniousness of music, Man, and the Divine, not to have attended to an increasing tension between immanence and change would have been unethical. And so it was that history became the first piece of the foundation of the “institutes” to be removed, the first among things to be cast away from the haven of correspondences, indeed objectified in its cognitive manipulation.⁸⁸ Zarlino’s compromise, such as it is, gives a hint of a turn toward manipulative knowledge that already and inexorably had been initiated.

It has become a common critical trope to interpret the crucial moment in which disputes between Zarlino and others took place as the passage into a new stage in the development of thought. Gesturing toward investigative experimentation, mathematical proof, and questioning of received authorities,

the period is said to herald the dawn of modern science. Galilei, for one, demonstrates that, besides string length, diverse criteria such as string tension or the dimension of pipes can be shown to produce consonant intervals in proportions other than those given by the Pythagorean tradition. Number, he concludes, is mute, being only a means of description, a unit of measurement.⁸⁹ It is undeniable that observation became a central criterion for the demonstration of phenomena, a criterion that would facilitate, as many are wont to say, the scientific revolution. A unitary mathematics bearing an all-encompassing internal logic would be shown to establish differences in our perception of material reality. There would emerge a crucial interpenetration of phenomenon and observation. Phenomena would no longer be subject to mere recognition. They would no longer lie in wait for our semiological and hermeneutic intervention. Phenomena had to be explained by recourse to empirical observation. This kind of observation would in turn lead to systematic experimentation—Bacon would call this *experientia literata*.⁹⁰ Systematic experimentation would provide the cognitive ground for all phenomena. There would have to be a general reconfiguration of experience, and knowledge would be made manipulative with logical rule as its instrument. The “musical thought” of Zarlino’s critics bears witness, as it were, to all this, as it does to the emergence of a renewed poetics of music by the humanists and a reconfiguration of the quadrivial structures by institutions of learning. In fact, their “musical thought” could be said to have both participated in a general reorientation in the nature of knowledge as well as produced an internal reorientation such as we witness in Zarlino’s *Sopplimenti*.

But to interpret these events in this way would mean getting ahead of history. I have drawn a general sketch of the motivations, commitments, and expectations of Zarlino’s thought according to a cognitive semiology that responds to demands placed on all knowledge, not just by theories of sound, let alone music theory. His biases, such as they are, resonate with the epistemological commitments of a time before signs are fully extricated from their correspondences with all things. Reactionary as his thought may appear in its irrelevance to the history of problems solved by his critics, it is fully consonant with those overarching correspondences. And these cannot be rendered obsolete before knowledge in its entirety is overhauled. Galilei may have provided the basis for a reconceptualization of the ontology of sound, but there is no indication that he might have advanced a new theory of signs. In his work we witness the beginnings of a move away from the idea that number is a sign inherent in sound. Knowledge of sound *qua* thing may be thus said to reside in a cognitive area outside of itself (sound). But this knowledge is not conceived as being internal to human cognition. For one, his analysis of proportions does not arrogate the traditional authority of number. Neither does he advance mathematics as a set of axiomatic relations capable of forming a logical context that would now define the objects of our experience. It could not have done so. We must keep in mind that there are no certain calls to cue that passage from one episode in the history of thought to the next. Thus, the numerology that Claude Palisca believes was dealt a fatal blow by the champions of experimentation (Benedetti,

Galilei, and Giovanni Fracastoro) is no more decisive a “historical” event than Cardano’s early advocacy of human perception and questioning of ancient authority, which by the same logic would have instigated the revision of Scholastic knowledge.⁹¹ An interpretation such as Palisca’s, which favors future “developments,” needs to be counterbalanced by consideration of writers who appear to think in past terms, so to speak. For example, Athanasius Kircher, writing in the supposed postnumerological era free of all mysticism, could still find enough intellectual ammunition in the seventeenth century to articulate a cogent universalist conception of music, refusing to separate the science of sound production and perception (the acoustics of the “new era”) from music’s place in the cosmos. As Frances Yates reminds us, there were “reactionary Hermeticists” in the seventeenth century, Kircher being one of the most notable.⁹² The notion of reactionary thinkers invites the formulation of another historical character, the “proactionary” thinker. There would belong the early experimenters, the debunkers of numerology, the scientists who would forever arrest the musical motion of the spheres. But I do not believe that we can identify Zarlino wholesale with any of these categories, unless we are willing to reduce the complexity of his thought and time. As I argue in the next chapter, the re-configuration of musical thought after Zarlino takes place once the perceiver is extricated from all observation and becomes in fact the observer of his own observation.