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SUNG BIRDS

*Music, Nature, and Poetry
in the Later Middle Ages*

ELIZABETH EVA LEACH



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For Mum and Dad

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I

Rational Song

For Augustine, birdsong cannot be music because a bird is incapable of attaining or exercising *scientia*. As the production of an irrational animal, spurred only by natural instinct, however beautiful and melodious it might be, birdsong is not music. That this conclusion might surprise us points to the ways in which the modern definition and ontology of music differ from those of late antiquity and the Middle Ages. The object denoted by *musica* in the writing of medieval authors overlaps with our modern usage but is both vastly broader in scope and, in its manifold subdivisions, more specific, especially in what it excludes. To complain that medieval music theorists do not comment much about “real music” is to assume that the most important musical reality, then as now, is sounding music in performance.¹ Examination of music treatises and other key intellectual sources for music, as well as the use of music and musical comparisons in other kinds of texts, reveals that the idea of music in the Middle Ages was significantly broader than that encompassed by the term today. Music included ethical, political, and mathematical discourses that must be taken seriously if the place of music in medieval intellectual life and in society is to be understood. Even when dealing with sonorous manifestations, writings about medieval music are far less concerned with musical compositions than with the composition of music—by which is meant its makeup in terms of mathematical ratios, the rational aspect that places sounding music within the domain of music broadly defined.

1. This popular assumption is strengthened by the pervasiveness of recorded music, which reduces music to (organized) sound. See Philip V. Bohlman, “Ontologies of Music,” in *Rethinking Music*, ed. Nicholas Cook and Mark Everist (Oxford, 1999), 31–32.

Medieval writers often address a more universal idea of music and its powers, tackling the ethics of certain types of music. Frequently, writers will make clear moral recommendations that inevitably jar present-day liberal academic readers. The evidence from the late Middle Ages in general is overwhelmingly that its written culture had an "extraordinary taste for instructive and devotional literature," and the literature of music theory is no exception.² In addition, the traditions of Platonic and, increasingly from the thirteenth century, Aristotelian philosophy placed music within an expressly educational context in monasteries, universities, and courts. Moreover, the predominant musical practice for most of the Middle Ages was the unaccompanied singing of the liturgical songs of Christianity. This chant was taught to boys as a vehicle for understanding Latin grammar, in which context didactic, regular, and instructional aspects were very much to the fore.

In medieval discussions, *musica* is usually subject to the tripartite division found in Boethius' influential sixth-century treatise *De institutione musica*.³ As is well known, Boethius divides music into three species: *musica mundana*, *musica humana*, and *musica instrumentalis*. *Musica mundana*, cosmic or heavenly music, is made by the rapid motions of heavenly bodies, giving the proportions of the seasons and other subdivisions of time.⁴ *Musica humana*, human music, is the uniting of the various parts of the soul and incorporeal reason with the body so that they work harmoniously as one. Only *musica instrumentalis* is something that we would classify as music at all, being the music of instruments, whether created by blowing (*musica organica*) or striking (*musica ritmica*) artificial instruments, or by the natural instrument of voice (*musica harmonica*). Boethius in fact moves quite swiftly over the first two species of music and claims that his treatise will start with an extended discussion of the third, but, as James McKinnon comments, he "moves on, then, not to a study of instrumental music, but to a study of pitch (the discipline of harmonics, that is) as demonstrated on instruments."⁵ For Boethius, therefore, this study of harmonics is a study of *musica instrumentalis*: that it might disappoint a musicologist's expectations of what a discussion of music should entail again reveals only an ontological otherness, even in the case of the Boethian musical species that most nearly approaches our definition of music. Far from treating specific works or instrumental practices, Boethius seeks instead to describe the sounding of instrumental music in Neoplatonic terms that show its harmonious proportions as being guaranteed by

2. See the introduction to David Chamberlain, ed., *New Readings of Late Medieval Love Poems* (Lanham, Md., 1993), 4.

3. The best edition is Boethius, *De institutione musica* (ed. Friedlein), which is the basis for the translation by Calvin M. Bower in Boethius, *Fundamentals of Music* (ed. Palisca).

4. Scholars in antiquity debated whether *musica mundana* was manifest as sound, even at source, a debate replayed in the later Middle Ages; see Joscelyn Godwin, *Harmonies of Heaven and Earth* (London, 1987).

5. *The Early Christian Period and the Latin Middle Ages* (ed. and trans. McKinnon), 27.

Pythagorean numerical ratios, and thereby its commonality as a species of music with the other two kinds.

The presence of number in medieval writing on *musica* is considerable. In making analytical readings of medieval musical works, certain modern scholars have readily taken the notion of sounding number as the compositional reflection of the fundamental preoccupations of speculative music theory.⁶ More recently, however, scholarly treatments of medieval music have veered from finding this unforgiving numerical rationalism compelling to finding it constraining. Two things about the Boethian tripartite division have seemed strange enough to bring into question its usefulness in orienting any enquiry into medieval musical cultures and practices. First of all, two of its three species make no humanly audible noise, and at least one of them does not make even an inaudible noise. Second, the materials proper to sounding music in the Middle Ages are rather limited in their mathematically sanctioned pitches, harmonies, and so on; this overregulation seems to stem from ethical considerations that we would deem irrelevant. Both these peculiarities limit music's appeal to the bodily senses and suggest that the pleasures of music are fundamentally intellectual and silent, even when they are expressed in sound. Faced with such counterintuitive conclusions, sustainable only if a seriously "other" Middle Ages is mooted, some critics have dismissed, downplayed, or questioned the role of Latin theoretical writings in the actual composition, performance, and reception of music in the Middle Ages. Christopher Page has pointed out that this preoccupation with music's intellectualism and number fits with the place of modern scholars in predominantly intellectual (rather than music performance) environments.⁷ Bruce Holsinger has proposed that

6. See, for example, Margaret Bent, "Deception, Exegesis, and Sounding Number in Machaut's Motet 15," *Early Music History* 10 (1991): 15-27; Dorit Esther Tanay, "Music in the Age of Ockham: The Interrelationships between Music, Mathematics, and Philosophy in the Fourteenth Century," Ph.D. diss., University of Michigan, 1989, published, with revisions that specifically address Christopher Page's criticisms of it, as *Noting Music, Marking Culture* (Holzerlingen, 1999); Laurie Koehler, "Subtilitas in musica: A Re-examination of Johannes Olivier's Ballade 'Si con cy gist,'" *Musica Disciplina* 36 (1982): 95-118, and *Pythagoreisch-platonische Proportionen in Werken der ars nova und ars subtilior* (Kassel, 1990); Stevens, *Words and Music in the Middle Ages*, 13-47.

7. Christopher Page, *Discarding Images: Reflections on Music and Culture in Medieval France* (Oxford, 1993), esp. chaps. 1-4; for the authority of counterintuitive conclusions within an assumed context of medieval "otherness," see esp. 13-14 (on James I. Wimsatt's statements about Machaut) and 190. For the debate that ensued after the review of Page's book by Margaret Bent, see her "Reflections on Christopher Page's *Reflections*," *Early Music* 21 (1993): 625-33; Christopher Page, "A Reply to Margaret Bent," *Early Music* 22 (1994): 127-32; Rob C. Wegman, "Reviewing Images," *Music and Letters* 76 (1995): 265-73; Philip Weller, "Frames and Images: Locating Music in the Cultural Histories of the Middle Ages," *Journal of the American Musicological Society* 50 (1997): 7-54; and Reinhard Strohm, "How to Make Medieval Music Our Own: A Response to Christopher Page and Margaret Bent," *Early Music* 22 (1994): 715-19. See also Christopher Page, "Around the Performance of a Thirteenth-Century Motet," *Early Music* 28 (2000): 343-57.

we see the “resolutely anticorporeal ontology” of medieval music as a ruse to deflect attention from its embodiment in performance and its bodily effects on listeners, an ideology “that sought to contain the visceral force of music through endlessly reiterated numerical abstraction while relying upon the sonority of the very flesh it explicitly denigrated.”⁸

For present purposes I am not concerned with diagnosing either the self-justification of modern scholars or the self-repression of their medieval counterparts. Rather I want to explore the ontology of music in the Middle Ages as far as possible in its own terms, not for what it fails to tell us, but as a body of cultural testimony to a central medieval perspective on the ontology of music, and from this to deduce an understanding of musical sound.⁹ I, too, am interested primarily in the part of *musica* concerned with performance, and in surviving written traces of medieval songs. But I am convinced that to understand those that represent birdsong and other nonmusical noises, we need to situate them in the ontological field of *musica*, even if this ontology is to some degree contested, not least by these songs themselves. To this end I can turn on its head the modern dismissal of *musica mundana* and *musica humana* from the domain of music. In assuming that music is fundamentally the sonic musical performance of the third Boethian category, modern scholars are forced to shake their heads at the bizarre philosophical gymnastics employed by medieval intellectuals to make their unscientific planetary macrocosm and human microcosm fit into the category of music at all. It seems as if the idea of music is just being applied metaphorically. I try instead to puzzle the question from the opposite starting point: given that the medieval ontological reality of music was a matter of rational measurement, how did medieval theorists manage to bring the actual practices of song and dance into its fold? In short, how did medieval music theorists recognize, ascertain, describe, and justify sounding music’s rationality.

I am interested here in the whole scope of what the Middle Ages called music. I take it as axiomatic that theoretical writings that consider music—not just music theory treatises but encyclopedias, theological works, and commentaries on classical philosophy—are part of a spectrum of information about the cultural status of music during this period. This book is centered on notated pieces of music, which I seek to contextualize as far as possible by describing the culture that produces them. To some extent this has already been done by scholars who have decoded—translated into modern notation—their

8. Bruce W. Holsinger, *Music, Body, and Desire in Medieval Culture: Hildegard of Bingen to Chaucer* (Stanford, 2001), 12, 9; see in addition 6–10, which further references the work of James I. Wimsatt and John Stevens.

9. Page, *Discarding Images*, 11, laments the “absence of informal or critical writings on music from the Middle Ages.” A disappointed or even exasperated tone in many musicological writings on music theorists is pervasive, as entries for individual theorists in *TNG* frequently attest. The problem is particularly acute for those theorists from the period before notation was generally deployed.

written traces using contemporaneous writings on music that give a detailed dissection of the notational system, its rhythms, pitches, and counterpoint. Such writings address far more than these practical matters, however, and in their disagreements and inconsistencies, they offer perspectives on received orthodoxies. It is important not to read these treatises only as technical users’ manuals, exercises in intellectual sophistry, or summaries of received wisdom, but instead to try to see them as constitutive of a late Latin literature with its own generic practices.

Medieval writers were aware of the multiple spaces occupied by *musica* and its various subdivisions. Scholastics would have been presented explicitly with the duality of music’s place in the medieval scheme of the arts. On the one hand, it was an art in itself; on the other hand, it was merely an aural manifestation of another: arithmetic. This duality was problematic: How could music be both its own art and merely the adjunct of another? Particularly in the decades around 1300, as music began its entry into the scientific cosmology of the later medieval universities, theorists presented many competing ways of effecting its subdivision, depending on their own particular, not yet stabilized criteria.¹⁰ In its details, medieval musical discourse is thus far from monolithic, especially with respect to the role of sense perception in the epistemology and hermeneutics of music.

Most medieval theorists of music, far from being divorced from practice, were almost invariably themselves singers, in that chant—*cantus (planus)*—formed a fundamental part of literate education and of daily Christian religious observance. A large number of music theory treatises are practical in scope and function, and are written by persons who are concerned with praxis. Even those emanating from the more rarefied atmosphere of the later medieval universities are written by *clerici litterati*, who would have been trained in singing. Compared to the rather reverential status now accorded musicality, medieval musical education is not only broader but also far more fundamentally part of learning per se, at least for this elite but relatively numerous group of the medieval population. Medieval singers as a broad group are not *bel canto* virtuosi dedicating their lives to this one art, but educated clerics for whom it is as unforgivable not to know singing as not to know the letters of the alphabet.¹¹ In fact these two arts—grammar and singing—were taught together, using similar methods, classifications, and categories.

Many treatises start with a wide-ranging discussion of *musica*, its definition, and origins, but go on to highly practical matters: the relative positions of the pitches (*litterae* or *claves*), the size of the intervals between them (*voces*),

10. See Gerhard Pietzsch, *Der Klassifikation der Musik von Boetius bis Ugolino von Orvieto* (Halle, 1929), 93; and Frank Hentschel, *Sinnlichkeit und Vernunft in der mittelalterlichen Musiktheorie: Strategien der Konsonanzwertungen und der Gegenstand der “musica sonora” um 1300* (Stuttgart, 2000), chap. 3.

11. The sentiment is Isidore’s and was repeated in many music treatises, notably those in the tradition of Johannes Hollandrinus; see *Opusculum de musica* (ed. Rausch), 82–83.

and the way in which the pitches of melodies were understood to be organized (*modi* or *toni*). Here the focus of treatises was narrower than our definition of music would allow, since the species *musica instrumentalis* (sounding music) was taught not in its entirety but only as the subspecies *musica harmonica*.¹² It is this subspecies that presents a particular challenge to medieval rationalism since its instrument—the natural instrument of the voice—was present in many living creatures. What follows in the rest of this chapter is of necessity a rather intricate discussion of the tortuous relations between rationality, ratio-based *musica*, sound, perception, meaning, nature, understanding, humans, animals, and the irrational, which will establish some basic tenets for the later discussion of birdsong and human music making. Our point of departure replicates that of many medieval music treatises: the popular story of Pythagoras' discovery of *musica*'s foundations.

Sounding Number

Despite their basis in abstract number, according to the Neoplatonists the rational principles of music were discovered only by means of their sonic manifestation. One day, the story goes, when Pythagoras was passing an open blacksmiths' shop, the sound of the hammers striking in alternate and regular succession seemed to him to give a musical interval (see figure 1.1). Pythagoras first has the men swap hammers to rule out speed or force of striking as a factor. Discarding one discordant hammer and then recording the weights of the four remaining hammers, he eventually works out that the harmony of tones is produced according to a proportion of their weights: 6:8:9:12. Within these ratios are contained all the "musical intervals" within the octave—the *consonantiae* of medieval Latin theory.¹³ In some versions Pythagoras then checks that the same mathematical principles can be applied to other struck instruments—bells or strings. This tale of the discovery of the basis of musical proportions is retold countless times in the ensuing centuries and occupies pride of place as an originary myth of music throughout the Middle Ages, despite the non-Christian nature of the protagonist and the fact that his "scientific" conclusions are empirically untrue.¹⁴ Boethius, for example, starts his study of

12. The other two types of *musica instrumentalis* (*musica ritmica* and *musica organica*) are what we would call instrumental music today. Save for treatments like those by Bartholomew the Englishman and Aegidius of Zamora, which are lists, perhaps with a brief description, of the kinds of instruments that might be included in each category, treatises dealing with these musics were rare.

13. That is, 6:12 (i.e., 1:2) is the octave itself; 6:9 (i.e., 2:3) is the fifth; 6:8 or 9:12 (i.e., 3:4) is the fourth; the difference between these two fourths, 9:8, gives the tone.

14. Various later medieval writers question the priority of Pythagoras, preferring instead to attribute the discovery to the biblical figure Jubal or Tubal. See the summary in Fritz, *Paysages sonores*, 128–37. The weight of hammers does not make much difference to the pitch of the struck anvil, as Vincenzo Gallilei showed in the sixteenth century. The story continued to be told, how-

musica instrumentalis by relating this tale. But *sound* is not coterminous with *music*. Music's sounding manifestation is, in medieval terms, optional: the harmony of music—music's fundamental "music-ness"—lies in numerical ratios, in proportion alone. For medieval minds, *musica* does not need to be embodied as sound; this is only one of its three species.

For later medieval readers especially, the story of Pythagoras in the smithy would have had another strong resonance, less abstract but more allegorical, and linking rationality, music, and nature. In discovering the nature of music in a forge, Pythagoras is occupying a location more readily associated with Lady Nature, who "mints" men—stamping them as coins were stamped in a forge (see figure 1.2). Nature's creativity is a picture of *procreation*. Nature's law allows animals to mate and continue their species. In Latin, the sparks that fly from an anvil when struck by a hammer were referred to using the word for "seed" (*semina*), the same used for the "spark of life," semen. This idea derives from Neoplatonic thought transmitted from late antiquity to the Middle Ages via epitomists and commentary writers. Macrobius notes that "once the seed has been deposited in the mint where man is coined, nature immediately begins to work her skill upon it so that on the seventh day she causes a sack to form around the embryo, as thin in texture as the membrane that lies under the shell of an egg, enclosing the white."¹⁵ This metaphor is taken up much more fully by Alan of Lille, in whose *Complaint of Nature* the fully personified Natura laments ever having taught Venus to work the hammers and anvils of her forge as she is now mismatching the wrong anvils with the wrong hammers in an excess of fornication: adultery, sodomy, and general promiscuity. Alan's Natura in turn forms the model for the vernacular Dame Nature in the highly influential *Roman de la Rose*. The way in which a natural process can be hijacked, or go wrong, and become *unnatural*, is an abiding preoccupation of music theory, one that will form the focus of chapters 4 and 5. Suffice it to say here that the intertwined rationality and naturalness of music carry clear moral imperatives for nature's only rational creatures—humans—whose rationality allows them to act against nature: while irrationality is natural for nonrational creatures, for mankind, rationality is natural.

As the only conjunction of rationality and nature other than the rational animals (humans), *musica* is fundamentally connected to humankind. The production of sounding music becomes a quintessentially human activity. This may seem odd, given that the Pythagoras story implies that music is *not* a human invention but derives from the organization of the world—if not the universe—*itself*. Yet, while in identity and nature *musica* ranges far wider in

ever; it works with string lengths. See James W. McKinnon, "Jubal vel Pythagoras, quis sit inventor musicae?" *Musical Quarterly* 64 (1978): 1–28.

15. Macrobius, *Commentary on the Dream of Scipio* (trans. Stahl). *Macrobius Commentarium in somnium Scipionis* (ed. Eyssenhardt), 498. See also George D. Economou, *The Goddess Natura in Medieval Literature*, 2nd ed. (Notre Dame, 2002), 19.



Figure 1.1. Pythagoras discovers musical principles at the smithy. From a copy of Johannes' *De musica* (ca. 1100) in a thirteenth-century manuscript (D-Mbs Clm 2599, f.96v) from the Cistercian Abbey of Alderspach. By permission of Bayerische Staatsbibliothek, Munich.



Figure 1.2. Natura in her forge. From *Roman de la Rose* (US-NYpm MS M.132, f.118v) illuminated by the Boqueteaux Master, France (possibly Paris), ca. 1380. By permission of the Pierpont Morgan Library, New York.

scope than our "music," *musica's* subspecies as *produced sound* are far narrower. Macrobius uses the Pythagoras story in a commentary which explicates not the practices of human music making but the principles of *musica mundana*. Pythagoras discovers these principles because he is rationally able to understand them, but they are present as *musica mundana* and *musica humana*, in nature. These three species together represent the Aristotelian threefold hierarchy of creativity found in writers from Calcidius to William of Conches, in which God truly creates, nature's laws carry on God's creation by producing more creatures, and human artistic creativity strives—ultimately in vain—to imitate nature. Within this scheme, Lady Nature is, in Chaucer's phrase, God's "vicair general"; she forges the embodied copies or images of the ideas that are present in the mind of God, who is the creator of the stuff that forms her raw materials in the sublunary world.¹⁶ The natural world is in turn the model for human artistic creativity, which is itself figured as a form of mechanical reproduction using the memory, a "machine for *inventio*."¹⁷ The music present at the superlunary level as a result of God's design is not audible (and might not actually sound in the first place, according to later medieval Aristotelian thinking). The sounds generated by nature and natural creatures, by contrast, are either prompted by natural instinct but authored by irrational creatures, or the result of inanimate objects (weather, waves, and so on); these sounds are thus themselves irrational and not to be dignified with the term *music*. When man comes to create his particular species of music, it occupies a tertiary kind of creativity, imitating Nature, who is imitating God. Although natural creatures are closer to the Idea of God's creation than the products of any human artistry can ever be, man's *fictio*, his imitation or mimesis of nature, is produced *per artem* using the divinely rational part of his soul, which elevates him above the other animals. As we shall see, this interpretation is the one that tends to be in play when the artistic rational song of man is deemed superior to the natural irrational songs of the birds.

Listeners: Irrational and Rational

While the production of music is limited to rational agents, its reception requires no such power; in fact, the power of music's own rational organization works well on irrational creatures, since they are unable to judge or resist it. Isidore of Seville repeats Cassiodorus' idea (drawn ultimately from Varro) that music captivates all categories of nonhuman animals—beasts, serpents, birds, and dolphins. This phrase forms part of the list of music's praises that appears at the opening of nearly all music treatises and encyclopedia entries.¹⁸ Even if

16. See Economou, *The Goddess Natura*, 26, also 16–24. See also chapter 2.

17. On this designation, see Mary Carruthers, *The Craft of Thought* (Cambridge, 1998), 7–10, 22–24, 62, 92–94.

18. Cassiodorus writes, "ipsas quoque bestias, nec non et serpentes, volucres atque delphinas ad auditum suae modulationis attraheret." Cassiodorus, *Institutiones* (ed. Mynors), 148. This phrase appears in Isidore's *Etymologies* verbatim, except for the substitution of the verb "provo-

it is the sounding species, music may affect a creature without necessarily being audible, just as the "harmony of the spheres" exerts influence on the lives of those below even if they cannot hear it. For example, medieval natural history texts note that bees, which they consider to be deaf, may be led by song when swarming. The harmonic order of sounding music speaks directly and without the necessity for aural perception to the social order of the hive. This power transcends music's sounding embodiment and has a direct effect on predisposed bodies with whose natures it accords.¹⁹

The medieval concept of music differs profoundly from ours both in its manifest nature (which does not have to be sonic) and in its reception (which does not have to be through hearing). The criteria for the production of music as manifested in sound, however, is far narrower in definition than we would allow: it must be natural *and* rational. As humans were the only natural creatures that were also rational, this was a way of defining music as an exclusively human art. And this is not the only way in which the medieval definition of music neatly mirrors the definition of the human. The human soul itself became newly theorized in the later Middle Ages so as to emphasize both its rationality and its fundamental embodiedness. Like *musica* in general, the human soul was deemed inseparably rational and material.

Music's power over animals, including humans, is praised and celebrated by music theorists, but its potential to divorce the act of sensing from rationally based perception is also its danger, as it could rob humans of their humanity. At the level of pure sense perception, humans are not as good in any single sense as certain other animals; for each of the senses medieval writers typically cited particular animals as that sense's paramount practitioner.²⁰ The rational component of the soul—the way in which humans may submit their sense perceptions to intellectual judgment—alone places humans above the other animals. Book 2 of Aristotle's *De anima* contains chapters on each of the senses.²¹ As this work gained an important place in late medieval Western intellectual

cat." See Isidore, *Etymologies* (ed. Lindsay), 3.17.3. The version of Bartholomew the Englishman translated by John Trevisa renders it as "And musik excitheth and conforteth bestes and serpentes, foules and delphynes to take heede therto." See Trevisa, *On the Properties of Things* (ed. Seymour), 1386.

19. Richard de Fournival, *Bestiary of Love and Response* (trans. Beer), 13; Richard de Fournival, *Bestiaires d'amours* (ed. Segre), 37–40. See chapter 5.

20. Richard de Fournival (*Bestiary of Love*, 12–13) cites the "line" (a little white worm) for sight, the mole for hearing, the vulture for smell, the monkey for taste, and the spider for touch. See also Elizabeth Sears, "Sensory Perception and Its Metaphors in the Time of Richard of Fournival," in *Medicine and the Five Senses*, ed. W. F. Bynum and Roy Porter (Cambridge, 1993), 17–39.

21. Manuscripts of Aristotle typically illustrate the five senses with a cock for sight, a boar for hearing, a vulture for smell, a monkey with a bun for taste, and a spider for touch; see Klingender, *Animals in Art and Thought*, 429; Elizabeth Sears, "The Iconography of Auditory Perception in the Early Middle Ages: On Psalm Illustration and Psalm Exegesis," in *The Second Sense: Studies in Hearing and Musical Judgment from Antiquity to the Seventeenth Century*, ed. Charles Burnett, Michael Fend, and Penelope Gouk (London, 1991), 19–39.

history, medieval thinkers such as William of Conches, Thierry of Chartres, and Clarembald of Arras began to chart the path of thought from sense perception to memory via the mediation of imagination and reason.²² Aristotle's text presents an idea of *aesthesis* that coheres well with his notion of the soul but for us wanders uncomfortably between sensation, perception, awareness, and even, in a weak sense, "consciousness."²³ To clarify this, twelfth-century writers theorized a number of chambers, or cells, within the human brain, in which reason's actions upon sense perception played a crucial role. The front part of the brain was where data collected by the senses was received; the back was the place of memory. Between these two areas was imagination or phantasy, a "holding area of images," which fixed the fitful impressions of the senses into durable and definitive form, and reason which acted upon this form. The key roles of the intermediary chambers were thus retention and discrimination.²⁴ The superiority of humans lay, therefore, not in the power of any one or the collectivity of sense perceptions alone but in the mental processes to which they were subject.²⁵

Most of the medieval intellectual interest in the soul addressed the complexity of human existence between material and immaterial worlds. As *De anima* rapidly became the most glossed and commented of Aristotle's treatises in this period, the obscure and muddled section on the intellect served medieval scholastics as a gap that could conveniently be plugged with Christian ideas about the soul's survival after death—something of no concern to Aristotle. But even the immaterial human intellect, whose subsistence (giving us kinship with the angels) was proposed by Thomas Aquinas, could not know anything without the images generated for memory from the perceptions of sense objects. Divine intervention was deemed necessary for the intellect to know in a disembodied state, since that state is not natural to it. Humans are not disembodied intellects but rational animals, belonging to the hylomorphic genus animal, of which they are the highest members on account of their uniquely rational and (according to Aristotle's scholastic commentators) immortal soul.²⁶

The pre-Cartesian, late medieval understanding of "the soul" (*anima*, Latin for the Greek *psychē*) was based on Aristotle's notion that its relation to the

22. R. W. Southern, *Robert Grosseteste: The Growth of an English Mind in Medieval Europe*, 2nd ed. (Oxford, 1992), 40.

23. Aristotle, *De Anima (On the Soul)* (trans. Lawson-Tancred), 75–86.

24. Southern, *Robert Grosseteste*, 40–42, quotation on 41.

25. Thomas Aquinas did not confine animals to mere sensation but also allowed them sense memory, phantasy, *vis aestimativa*, and a minor power of self-determination. Their souls, however, were not immortal, and they lacked intellect, free will, and the ability to form general concepts and determine judgments. Relevant extracts from the *Summa Contra Gentiles* (ed. Rickaby) can be found at www.nd.edu/Departments/Maritain/text/gc2_66.htm.

26. Thomas S. Hibbs, ed., *Thomas Aquinas on Human Nature* (Indianapolis, 1999), xi–xiii; Caroline Walker Bynum, *The Resurrection of the Body in Western Christianity, 200–1336* (New York, 1995), 229–343.

body was hylomorphic, that is, one of form (soul) to matter (body). Neither of these two components could be reliably separated in practice, just as a form such as a color cannot exist aside from the matter that has that color, nor could a color be experienced and apprehended without material form. In short, late medieval Christianity rather positively embraced the person as a psychosomatic whole: the soul is fundamentally embodied, the embodied Man-God Christ is necessary to the working of the universe, and the idea of bodily resurrection is central to eschatology.²⁷

The hylomorphic soul was mirrored during the thirteenth and fourteenth centuries by a growing tendency toward an epistemology based in sense perception and personal experience.²⁸ Bestiaries, for example, show an increased tendency to portray certain animals "from life," rather than relying on traditional patterns, even if their texts still drew symbolic morals from these animals' often fantastic traditional attributes. In technical treatises on hawking, author-practitioners present facts in contradiction of received *auctores*, even of Aristotle himself, if their own observations demand it.²⁹ With respect to the sense of hearing, the audibility of the harmony of the spheres provided a point of debate between those for whom knowledge was grounded in sensory perception and those for whom it was gained through intellection. In classical antiquity the debate had been between the Platonic-Pythagorean idea of the proportional motions of the planets of necessity being music (because music is nothing other than movement in proportion), and Aristotle's more empirical stance that, as we are unable to hear this sound, its nature is irrelevant to us and enquiry into it is foolish. After the translation of Aristotle's *De caelo* in the twelfth century, this debate was replayed in the later Middle Ages. The newer epistemological position did not replace the older one, however, nor was the ultimate elevation of rational judgment significantly eroded; if anything, writers developed surprising and often ingenious ways of reconciling these opposed views.³⁰

Although the interest in sound and its audition is not insignificant and gains ground in the later Middle Ages, an important moral caveat remains in force:

27. See, for example, Bynum, *The Resurrection of the Body*, 11. What Christian teaching rejected was not the body itself but certain specific immoral acts and their sinful mental motivations. As sinful acts were symptomatic of immoral, incorrect judgment—or a complete absence thereof—thought alone was also potentially sinful and did not necessarily require enactment.

28. Gabriela Ilnitchi, "Musica Mundana, Aristotelian Natural Philosophy, and Ptolemaic Astronomy," *Early Music History* 21 (2002): 43.

29. Klingender, *Animals in Art and Thought*, 350–51, notes that the "enthusiast's compendium" Emperor Frederick II's *De arte venandi cum avibus* (before 1250) is "based on first-hand observation and verification of bird behaviour" and "is virtually the first handbook of ornithology to go beyond Aristotle." The *De animalibus* of Albertus Magnus (1262–80) similarly draws on personal experience rather than on Aristotle, despite the depth of the author's knowledge of the philosopher.

30. For one spectacular example, which blends Aristotelian thinking and Ptolemaic cosmology to make a defense of the Platonic view of the harmony of the spheres, see Ilnitchi, "Musica Mundana."

like the immediate perceptual information of the other senses, aural sensations are not to be trusted before being processed and judged by the intellect's rational faculty. Aided by Aristotle's lack of a clear division between things we might separate as sensing and perception, medieval listeners are under a strong compulsion not just to experience aural data as mere sensation but to employ the intellect to deduce the truth of the matter.³¹

In the intellectual climate of the later Middle Ages, theories of the soul sought to pin down the features of the human soul that make its owners peculiarly human rather than angelic or merely animal. Differentiation from the animal world was of greater concern, since humans shared many obvious qualities with beasts, not least their perceptible presence in the natural sublunary world. Being moved by sounding music is also a trait shared with animals, but human listening should differ in being more acutely receptive to music's effects and able to deploy reason to judge their goodness. The judgment of the rational listener generally inquired into two aspects of sounding music: the rationality of the sounds themselves, and the rationally based praxis of their performers. In this way, the peculiar properties of human music making, like those of the human soul, could be situated between the songs of birds and the choirs of angels.

Rational Vox

Two of the subspecies of *musica instrumentalis*—*musica organica* and *musica ritmica*—are not often discussed in medieval music theory. This is not simply because *musica harmonica* was a fundamental part of medieval Christian worship and education. The other two species involve the use of artificial instruments, which guarantees the presence of a human operator. Their status as *musica* could thus be accepted tacitly, even if such acceptance was hinted at in much of the Middle Ages only in worries about the unlettered nature of actual instrumental performance (as I discuss in chapter 3). Animals did not play artificial instruments (at least outside the realm of marginal manuscript drolleries). By contrast, the natural instrument—voice—is shared with other animals, some of which—notably birds—make music-like noises. Music theory therefore sought to preserve the place of chant as music—an artistic production using natural human reason—and differentiate it from natural and perhaps pleasingly melodious sounds made by irrational animals. The precepts of grammatical teaching, which was closely allied with the teaching of singing in medieval schools, offered a useful model for music theory. Like music, language is a rational production natural to humans; and like language, *musica harmonica* is articulated by means of *vox*, a subject with which many medieval grammars opened.

31. Aristotle, *De Anima*, 77–80. This goes for music, too; see chapter 4.

Ways of ensuring the rational status of music are most visible in music theory works that divide the concept of *vox* so as to isolate the specific kind of *vox* that overlaps with one of the subdivisions of *musica instrumentalis*: *musica harmonica*. Relying predominantly on the definitions of Isidore of Seville, whose *Etymologies* was a key reference work throughout the period, medieval theorists typically define voice as a subset of sound. All voice (*vox*) is sound (*sonus*), but not all sound is voice; the sound that *is* voice is specifically that produced by the voices of human beings or animals—that is, by the breath of something which is alive, has blood, and itself possesses a sense of hearing.³² This division gained new pertinence and an earlier, more authoritative source with the translation of Aristotle's *De anima* into Latin by William of Moerbeke in the thirteenth century.³³ Unlike the fourth- and fifth-century grammarians, who tended to use voice in a looser sense, Aristotle excludes instruments from having voice except “by analogy,” and defines *vox* as “a kind of sound of an ensouled thing,” that is, something that is alive.³⁴ This condition is necessary but not sufficient, however, since he too excludes bloodless animals as well as fish on the basis that they do not breathe air. In the tripartite division of *musica instrumentalis*, the sound that is not voice can still produce music, but this is either *musica organica*, produced by blowing (i.e., using wind instruments), or *musica ritmica*, produced by the impulse of the fingers (equivalent to strings and percussion). Organic and rhythmic musics use a sound that is not voice because they are produced on artificial instruments. The sound that is voice by definition uses air and the natural instrument of a living being. Where *vox* intersects with one of the subdivisions of *musica instrumentalis*, therefore, is in the category of *musica harmonica*.

In light of the definitions given in a number of music theory treatises, it seems that the rational properties of *musica harmonica* were typically assessed by asking two interdependent questions. The first question seeks to establish rationality as a sonic criterion, asking whether the sensible product itself is ra-

32. See Isidore, *Etymologies* 3.15–23, translated in *The Early Christian Period*, 39–44. See also Calvin M. Bower, “*Sonus, Vox, Chorda, Nota*: Thing, Name, and Sign in Early Medieval Theory,” in *Quellen und Studien zur Musiktheorie des Mittelalters*, ed. Michael Bernhard (Munich, 2001), 47–61.

33. See Aristotle, *De Anima*, 178–79, and 1. 23 in Jacques de Liège, *Speculum musicae* (ed. Bragard), 1:72.

34. Aristotle, *De Anima*, 178. Isidore also applied this stricter definition to *vox*, noting at the same time its common misuse. Augustine and Martianus Capella use *vox* for both human voice and the sound of instruments. After Guido, *vox* also came to mean loosely “note” (which is *sonus* or *phthongos* in these earlier writers); see Augustine, *On Music*, 177n5. The distinction shows a clear and critical divide between the producing agent (*vox*, the human voice) and that produced (*sonus*, the musical note); see also Bower, “*Sonus, Vox, Chorda, Nota*.” For the grammarians, see Wolfram Ax, *Laut, Sinne und Sprache: Studien zu drei Grundbegriffen der antike Sprachtheorie* (Göttingen, 1986); Vivien Law, *Grammar and Grammarians in the Early Middle Ages* (London, 1997); and Martin Irvine, *The Making of Textual Culture: “Grammatica” and Literary Theory, 350–1100* (Cambridge, 1994).

tional. This sonic criterion would be fulfilled if the song exhibited pitches (*voces*) tuned by the ratios that are the natural principles of all music, and/or if its sound conveyed linguistic sense (*verbum*). The second question seeks to establish rationality as a criterion of the producing agent of the sound, asking if the producing agent is human, and if so, whether that agent is employing the understanding of the rational principles of musical sound as defined in the sonic criterion. Each of these criteria depends on the other: the second criterion may be manifest sonically in the first; but, as we shall see, the first is necessary but not sufficient as proof that a song is really music.

The bipartite nature of the sonic criterion involves two different aspects of *vox* as understood through the grammatical pedagogy in which singing played such a large role. The grammarians whose writings were central to medieval clerical pedagogy were at pains to divide up the world of sounds so as to define human utterance as a particular type of voice—a subdivision of the overall category of *vox* called *vox discreta* or *articulata*. This “discretion” separated human language from other sounds, thereby defining the subject proper to grammar. Deriving from *discernere*, *discreta* implies that the *vox* can be discerned or understood. Grammarians demonstrably interpret this in two distinct ways. Some grammarians mean an *analytical* understanding, in which *vox* can be resolved into indivisible sonic components (for linguistic *vox* these are represented by single letters, which medieval grammarians viewed as coterminous with phonemes). Other grammarians mean a semantic understanding, in which the *vox* signifies something—that is, it contains a *sensus mentis*. Some late Latin grammarians treated musical sounds produced by human instrumentalists as a separate category, but none mentions song expressly.³⁵ While the utterance grammarians treated was speech—and specifically the words of literary language—there was no sharp distinction between speech and song: both are linguistic vocal performances. These grammarians, therefore, offered a model for the later medieval music-theoretical definition of *musica harmonica*.

During the earlier Middle Ages, music did differ in one significant way from language in that it did not have its own form of writing. The notation of music and the notation of language are linked in that they both pose the problem of how to visualize something that exists in time rather than space. The beginnings of music writing in the West coincide with the renewed interest in grammar during the Carolingian period, with whose educational program the origins of the notation of chant have been linked.³⁶ Vivien Law has argued that the renewal of Latin grammar teaching in the central Middle Ages reflects the

35. But see the comments on “arma virumque cano” later in this chapter.

36. Kenneth Levy, *Gregorian Chant and the Carolingians* (Princeton, 1998); David G. Hughes, “Evidence for the Traditional View of the Transmission of Gregorian Chant,” *Journal of the American Musicological Society* 40 (1987): 377–404. For different readings of the evidence, see the essays collected in Leo Treitler, *With Voice and Pen: Coming to Know Medieval Song and How It Was Made* (New York, 2003).

beginnings of a more visual mentality. Although alphabetic writing had long since been invented, the use of language to address questions *about* language did not start until the fifth century BC, and not until the first century BC did the compilation of systematic grammars begin. Through their doctrine, meta-language, and page layout (paradigms in running text rather than tables), the grammars compiled between then and late antiquity suggest a predominantly aural mode of perception. This is not to say that letters and writing were not used as a way of discussing language: as we shall see, the discrete sounds of spoken language are usually defined by their ability to be expressed in letters. The units of analysis, however, are defined phonologically: Donatus (ca. AD 350) defines vowels as “those sounds which can be produced on their own and may form a syllable on their own.”³⁷ As Law notes, “Elements on the meaning-form boundary such as our ‘morpheme,’ ‘stem,’ ‘root,’ ‘affix,’ ‘prefix,’ ‘suffix’ are not to be found in ancient linguistic analysis; when Roman grammarians describe morphological processes, it is entirely in terms of speech sounds and syllables.”³⁸ The origins of the shift to an increasingly ocular conceptualization of language are difficult to locate geographically or explain causatively, but the first clues appear in a seventh-century commentary on Donatus’ *Ars maior* from Bobbio (northern Italy), which uses the terms “litteratura” and “superficies” (surface) as well as “vox” and “sonus” to describe word form. This trend is widespread in Irish commentaries of the ninth century, at which time tabular format for linguistic paradigms starts to be more common. Law is quick to point out that this transition to the visual mode is not completed in the early Middle Ages, but from the ninth century onward, we find a growing number of signs of visual mentality; by the twelfth century, consistent segmentation in giving word forms becomes the norm.

It is over this same period—between the ninth and twelfth centuries—that we observe the visualization of musical sounds. These start as pictures of vocal gestures—the *motus vocum*—using a neumatic pictogram for each motion, each of which could involve several elements that we would notate separately as individual pitches. But just as grammatical treatments start to show a greater interest in a segmentation that required a visual counterpart for every linguistic element, musical notation too adapted letters to depict its own individual elements. The ability to write down musical sound alphabetically allowed musical melody to be separated off from speech in a manner not seen before. This writing started as a way of teaching chant more quickly, but the unintended consequence was to “litterize” the melody itself—to give it a language character of its own aside from but parallel to (and described in the same terms as) that of the verbal text with which it had always been performed. The more explicit use of grammatical terminology that follows from this—as well as being logical given the shared pedagogy—perhaps additionally

37. Law, *Grammar and Grammarians*, 250–59.

38. *Ibid.*, 250–51.

represents an attempt to deflect the consequences of melody's potential new scribal independence from words.

The grammatical tradition of antiquity offered medieval writers two main ways of classifying *vox*, both of which were used by music theorists for somewhat different purposes. The first tradition separates the types of *vox* into two principal voices, which are sharply differentiated. This twofold division tends to be used later by music theorists who want to locate musical rationality in the pitched sounds of sung melody. The second, fourfold division of voice represents a refinement of this twofold classification, recognizing and rationalizing a gray area between the two principle *voces*. As we shall see, this definition is used by music theorists who want to locate music's rationality in the verbal sounds of sung melody; but first I turn to the simpler two-voice model.

Two Principal *Voces* in Grammatical Writings

Appendix 1.1 shows grammarians' division of sound into two principal voices: *vox articulata/discreta* ("articulate" or "discrete" *vox*) and *vox confusa* ("undifferentiated" or "confused" *vox*). Among fourth-century grammarians such as Donatus, Charisius, and Diomedes, articulate voice is rational, clearly pronounced in speech, and thus literate or writeable because it can be composed with letters.³⁹ Writeability is the guarantor of rationality and thus of articulacy to the extent that some grammarians, such as Probus, just define articulate sounds as "writeable."

The only musical sound mentioned by these grammarians is that of instruments. Given that at this time musical sounds could not be expressed in letters, they are problematic with regard to the criteria for articulate *vox*, despite seeming to be "clearly pronounced" and even rationally organized. Diomedes comments that some people place musical instruments in the *confusa* category since their sound cannot be written; but as it "can be measurably differentiated," he thinks it might best occupy a middle category between eloquence (speech) and sound (noise). Victorinus, by contrast, classes instrumental sounds as a musical form of *vox articulata* on the grounds that they have the simple *voces*—that is, the discrete pitches—that *vox confusa* lacks. But for late antique grammarians, therefore, the perception of the rationality of musical sound was in conflict with the fact of its not being able to be written in letters.

Two Principal *Voces* in Music Theory: Discrete Pitches as Literate Music

Early in the first century of the second millennium, a system developed of writing music down that gave specific information about the tuning relative to one another of individual pitches of a melody. Music writing had existed since at

39. See *Grammatici Latini* (ed. Keil). For short details on individual grammarians, see Vivien Law, *The Insular Latin Grammarians* (Woodbridge, Suffolk, 1982), 11–29.

least the mid-ninth century, but the neumes that graphically represented the movement of the voice were not able unequivocally to show the intervals between one note and the next to someone who did not already know the song. Similarly, various alphabetical notations had already existed, mainly for use in theoretical writings that needed to specify relative pitches.⁴⁰ In the early eleventh century, Guido of Arezzo combined a repeating collection of seven letters, A to G, with the spatial figure known today as the staff, which fixed pitches defined by letter names into relative positions, shown visually.⁴¹ In effect, Guido gave each discrete musical note a separate name, isolating these elements—which we would now readily see as individual pitches but which had been regularly bound together in single neumatic expressions—as the fundamental and indivisible parts of musical discourse. But a pitch cannot have an existence alone; it must have a context. Today we have the fixed context of the twelve notes in the chromatic octave, tuned to an absolute pitch standard (A above "middle-C" = 440Hz). The Middle Ages lacked an absolute pitch standard, but Guido provided relative positions through his double sequence of seven alphabetical letters, first in uppercase and then in lowercase.⁴² His dual naming system additionally provided an interval context by also giving each note one of a series of six syllables, whose intervallic relations were fixed: ut, re, mi, fa, sol, la (an interval sequence of tone, tone, semitone, tone, tone). His idea that a single note (variously termed *sonus*, *phthongos*, *vox canora*, or just *vox*) comprised letters and syllables mirrored fourth-century grammarians' use of *vox* for a word's sonic form, which is similarly made up of letters and syllables (compared to a word's *verbum*—not comprising any physical elements—which is its semantic meaning).⁴³ Guido proposes his music notation as an effective means to accelerate the learning process for boys being in-

40. See Richard Crocker, "Alphabet Notations for Early Medieval Music," in *Saints, Scholars, and Heroes: Studies in Medieval Culture in Honor of Charles W. Jones*, ed. Charles Williams Jones, Margot H. King, and Wesley M. Stevens, 2 vols. (Collegeville Minn., 1979); Blair Sullivan, "Alphabetic Writing and Hucbald's *Artificiales Notae*," in *Quellen und Studien zur Musiktheorie des Mittelalters*, ed. Michael Bernhard (Munich, 2001), 64–80.

41. Two short treatises outline his system: Guido of Arezzo, *Prologus in Antiphonarium* (ed. van Waesberghe), and *Epistola de ignoto cantu* (ed. Gerbert). Both are translated in *The Early Christian Period*, 101–8; and in parallel text in Guido d'Arezzo, *Regulae Rithmice, Prologus in Antiphonarium, and Epistola ad Michaelem* (ed. and trans. Pesce). Guido's staff resembles the string diagrams that show pitch in earlier treatises, but he chose also to use the spaces between the lines, which had been meaningless in string diagrams. Nonspecialists are advised to read Karol Berger, "The Hand and the Art of Memory," *Musica Disciplina* 35 (1981): 87–120; and the excellent summary of this as Berger, "The Guidonian Hand," in *The Medieval Craft of Memory: An Anthology of Texts and Poems*, ed. Mary Carruthers and Jan M. Ziolkowski (Philadelphia, 2002). See also the entry on "Notation" in TNG following further links using the on-line version.

42. A small number of pitches above the second octave were shown with double lowercase letters (*aa*, *bb*, *cc*, etc.). One pitch below the initial A was given the Greek letter gamma. The dual name of this pitch (Gamma-ut) gives the name for the whole sequence of pitches—the gamut.

43. See Law, *Grammar and Grammarians*, 260–65. For a penetrating analysis of Guido's use of grammatical models, see Karen Desmond, "Sicut in Grammatica: Analogical Discourse in Chapter 15 of Guido's *Micrologus*," *Journal of Musicology* 16 (1998): 467–93.

structed in *cantus* (liturgical chant), boys who would also be being trained in Latin grammar.⁴⁴

Not surprisingly, since Guido is giving pitch its own literate identity, he is the first theorist to talk about melodic composition *per se*.⁴⁵ Everything that is spoken can be written, he claims, and everything written can be made into song. Thus everything that is spoken can be sung, for writing is depicted in letters. Guido seems to be overcompensating for the freedom from actual language that he has gained for musical pitch. In giving musical pitches their own letters—which, for all they may look like the letters of the ordinary alphabet, do not signify those same verbal sounds—he has in fact separated melodic human utterance from linguistic human utterance. At the end of his major treatise, the *Micrologus*, it seems that he is frantically trying to tie them back together, giving a composing system for deriving melodies from the vowels of the texts that they set.

After the invention of musical staff notation, many music theorists used a twofold division for differentiating between articulate and confused sound. For them the *vox* proper to music is *discreta* because it can be understood analytically to be made up of single indivisible elements, in this case discrete pitches within a rationally organized octave. The way in which sung articulation comes to mean “composed of discrete pitches” is facilitated by pitch becoming writeable; it too can be “composed with letters,” as the grammarians demand. As in grammar treatises where classification of *vox* is a prelude to a discussion of the *litterae* of written language, the discussions of *vox* in music treatises also invariably precede the discussion of the letters with which it can be written down.

Writing nearly a century after Guido (on whose *Micrologus* his own treatise is modeled), an important theorist known simply as Johannes (earlier called variously John Cotton or John of Afflighem) uses the paired terms “discrete” and “indiscrete” to designate the presence and absence, respectively, of meaningful, measurable musical intervals between individual, distinct pitches in a melody. Musical intervals, often referred to as *consonantiae*, are assured by learning the dual naming system of *litterae* (letter names) and *voce*s (solmization syllables giving interval context), whose exposition follows the discussion of *vox*.⁴⁶ As with the definition of speech, the *vox* that can be composed with

letters is assumed to be rational, in musical terms, because the intervals that fix each pitch within the octave may be expressed as a ratio. The sound's rational measurability can be equated to its writeability. Thanks to Guido's innovation, subsequent theorists (music theorists appear in bold in appendixes 1.1a–b), such as Johannes, Jerome of Moray (formerly called “of Moravia”), and Aegidius of Zamora, were able to consider ecclesiastical song as working within the definition of articulate *vox* given by Donatus: “Littera est pars minima vocis articulatae.”⁴⁷

Appendix 1.1b re-presents the information in 1.1a, organizing it by the sounds in question. Most of the assignments of *vox* are unequivocal, but those discrepancies that do occur can be explained through reference to the presence or absence of discrete pitches in the object cited. Probus and the early commentator on Guido's treatise consider birds' voices as *vox confusa*, but cite only the crow, whose voice is not discretely pitched (it is not a songbird). In this sense the crow is categorically identical to the quadrupeds. Similarly, the *cymbali* that are discretely pitched in Johannes and Jerome are *vox confusa* for Probus and Aegidius. This probably reflects the two different meanings of this term, which could designate an item of “unpitched percussion” (*vox confusa*) or “tuned percussion,” resembling a set of bells (*vox discreta*).⁴⁸

Both Jerome and Aegidius give as examples of indiscrete sound the laughing and groaning of men; Jerome also includes the barking of dogs and the roaring of lions, as he finds in his source, Johannes.⁴⁹ For both Jerome and Johannes, this binary division can also be applied to the broader category of sounds (*soni*) that are not strictly *vox*. The distinction found in Johannes and Jerome is close to that found in Probus' *Instituta artium*. For Probus, discrete sound is that which can be recomposed from the discrete units of sound represented by the individual letters of the Latin alphabet, which were considered the irreducible phonetic component of human speech.⁵⁰ Just as the articulacy of *vox*

definite numerical proportion, speaking generally, receive the name of consonance [*consonantiae*].” Jacques de Liège, *Speculum musicae* (ed. Bragard), 7a:70, translation by Leofranc Holford-Strevens.

47. “The letter is the smallest part of articulate sound.” Quoted in Sullivan, “The Unwritable Sound of Music,” 3 and n9. See also Irvine, *The Making of Textual Culture*, 97–101.

48. See *Cymbala* (ed. van Waesberghe), 11–12. Sullivan, “The Unwritable Sound of Music,” 4, also notes that “flutes” are classified as indiscrete in Probus, which he contrasts with the assignment of the flute to the *articulata* category by Victorinus and Diomedes' recognition of its measurably differentiated sound. The word used for “flute” in Probus' treatise, however, is *fistula*; Victorinus uses *tibiae* and Diomedes uses *tibae* (perhaps an error for *tubae*). The *fistula* is mentioned by the music theorists Johannes and Jerome as a kind of pipe used to imitate birdsong. For them it is an example of indiscrete sound, and it thus appears that the bird noises being imitated are not those that comprise discrete pitches. The implication of the assignment of bird whistles and human whistling to the indiscrete category is that sounds we would register as a glissando were not counted as discrete for all that they may be, in our terms, sung.

49. See Johannes Aegidius de Zamora, *Ars musica* (ed. Robert-Tissot), 60; and Jerome of Moray, *Tractatus de musica* (ed. Cserba), 41.

50. Sullivan, “The Unwritable Sound of Music,” 3.

44. See “Guido of Arezzo [Aretinus],” in *TNG*.

45. See chap. 17 of Guido of Arezzo, *Micrologus* (trans. Babb), 74–77. The highly grammatical chap. 15 is translated as if it refers to composition too, although Desmond, “*Sicut in Grammatica*,” 490, has argued that the making it refers to is that of a singer in performance. For performance as a kind of composition, see my discussion in chapter 3.

46. These are not consonances in the contrapuntal sense of chords made up of notes sounding well together, but are rather the placements of the notes within the octave resulting from a succession of correctly measured intervals. Registering the link with the consonants of language, a point he takes from Calcidius, Jacques de Liège glosses: “Just as (they say) the parts of articulate speech are the letters [*vocis articulatae partes sunt litterae*] out of which syllables, nouns, and verbs are made by composition, so out of the linking of sounds [*ex sonorum copulatione*], which are the first foundations of singing [*cantus*], there are born mixed sounds that, if they are reducible to a

was guaranteed by its writeability for a grammarian such as Probus, the discreteness of musical sounds was guaranteed by the possibility for the size of the steps between them to be expressed within the Guidonian system. A sung melody that could not be spelled out with letters and *voces* was not rational, that is, not *vox discreta*. The system thus has to do not merely with the stability of a single sung tone but with the relations of tones one to another within the octave, correctly divided according to rational numbers. An early gloss on Probus explains the etymology of *articulate* as relating to the smallest joints of the body and thus as being writeable with the fingers (*articuli*).⁵¹ As well as being demonstrable pedagogically on the monochord—which is also operated by the fingers—the articulacy of discrete pitches is also contained in their writeability; “discrete” then comes to mean “able to be written down.”

It is interesting, however, that the equation of singing with discretely pitched sound is only implicit. As the treatises are designed to teach the singing of chant, this kind of singing, done correctly, implicitly occupies the category of articulate *vox*. Johannes, Jerome, and Aegidius, mention only the sounds of tuned instruments in this capacity. If anything, however, this clarifies their point, since there is no question that the rationality of this sound could be based on anything other than the nature of its pitches because it has no *verbum* (semantic meaning); it is not a human vocal utterance. On the contrary, human vocal utterance that lacks discrete pitches, even if a verbal-linguistic meaning may be appreciated from it, would have to be classified as confused, at least in musical terms. The specifying of instrumental music in the category that was the one in which language belonged for the grammarians confers language status on discrete pitches alone, regardless of the presence or absence of words.

Making this equation between demonstrable pitches within the Guidonian gamut and their writeability places rational musical voice on a par with spoken language through parallel grammatical definitions. This makes sense in treatises designed to teach chant; the understanding of, and ability to read, the words of the chants is taken for granted. It is the singing of these words to discrete pitches that will result in musical *vox discreta*. Ultimately, however, it does not in itself guarantee musical rationality. As Augustine comments in his master-student dialogue treatise *De musica*, the nightingale and those players of instruments who cannot explain the rational basis of their own practice produce melodies that are numerate and comprise musical intervals, but no one would call them rational practitioners of the art.⁵²

Four Species of *Vox* in Priscian

In fact, even early grammarians recognized the problem with making writeability the sole guarantor of rationality. Nonsense words or meaningless concatenations of syllables can be written down and spoken but are not rational

51. See *ibid.*, 6.

52. See my discussion in the introduction.

because they do not convey any semantic meaning (*verbum*). The sixth-century grammarian Priscian, who is methodologically more explicit than earlier writers, had already noted the first problem and proposed that the criteria of rationality and writeability, which had been merged as property and index in the idea of *vox articulata*, be separated out. The possible combinations of these two principal voices then give a total of four species. Priscian's most important treatise, the compendious *Institutiones grammaticae*, became extremely widely known in Europe after the early ninth century, serving as a more expanded accompaniment to the basic text by Donatus. In his *Nova musica* (1403–10), the singer, composer, and choir director Johannes Ciconia explains the relation between the two most important grammarians, Donatus and Priscian, as he classifies the different types of *vox*. His comparison of the subdivisions of *vox* proposed by these two authors makes it clear that the division into literate and nonliterate *vox* is a supplement to the more basic binary division into articulate and confused (non-articulate) *vox*:

Every voice either is articulate or confused [*articulata aut confusa*]. Articulate is that which can be expressed by letters. Confused is that which cannot be written. Articulate voice is called, on the evidence of Donatus, that which is produced by a strictly defined word. In another way, however, articulate voice is so called because it restricts [*artat*] us, that is, it limits us to itself for understanding. But confused voice is that which can neither be written nor understood. Meanwhile it should be noted that Donatus, in defining the two principal voices, wished four species to be understood under these, which Priscian enumerates with better art: articulate and literate, inarticulate and literate, articulate and illiterate, and inarticulate and literate.⁵³

Ciconia explicitly relates the way in which the fourfold division—literate, articulate, and their opposites—is in fact a more artful way of classifying a simpler twofold division into *articulata* and *confusa*.

It is perhaps clearer if the fourfold division is expressed as a two-digit binary number as in table 1.1. The digit 1 indicates the presence of a trait; 0 signals absence. The first digit represents the dominant component of articulacy (1 for articulate, 0 for inarticulate), and the second digit represents whether or not the utterance can be written in letters (1 for literate, 0 for illiterate). The articulate and literate *vox* of human speech is thus 11, articulate but illiterate *vox* is 10, inarticulate but literate *vox* 01, and the confused noise of inarticulate and illiterate *vox* 00. In separating the two terms “articulate” and “literate,” Priscian effectively recognized two middle categories between writeable and meaningful *vox* (human speech) at one end and unwriteable and meaningless *vox* (noise) at the other. The former is truly articulate or discrete, the latter truly confused.

My binary figures elucidate the difference between the two middle cate-

53. Ciconia, *Nova musica* (ed. and trans. Ellsworth), 70–71.

Table 1.1. Four Species of Voice in Priscian and Music Theorists

	Rational		Irrational	
	11 (and writeable)	10 (and not writeable)	01 (and writeable)	00 (and not writeable)
Priscian, <i>Institutiones grammaticae</i> (6thC)	"arma vinique cano"	men whistling [men] groaning	"crox" "cra"	rattling lowing
Marchetto of Padua <i>Lucidarium</i> (1317/8)	"Petrus," "Martinus"	men whistling groaning of the sick	voices of birds "cra cra" "cu cu"	lion roaring oxen lowing
Ciconia <i>Nova Musica</i> (Padua, early 1400s)	"arma virumque cano"	men whistling by which we mean to calm a horse or call a dog groaning of the sick by which we understand pain modulation of strings by which we mean a certain number of syllables (itches)	voices of birds "croas" "cra"	cattle lowing creaking of walls
Johannes de Olomons, <i>Palmis choralis seu de cantu ecclesiastico</i> (near Milan, probably 1425 and 1443)	"mi"	groaning of the sick	"cra" of crows	grinding of teeth
Bonaventura da Brescia, <i>Brevi collectio artis musicae</i> (<i>Venturina</i>) (1489)	"Pater," "Mater"	men whistling by which we mean to call or calm various animals groaning of the sick by which we imagine their pain	voices of birds "cra cra" "cu cu"	lion roaring rustling of trees
Rossetti Biagio, <i>Libellus de rudimentis musicis</i> (Verona, 1529)	"Petrus," "Johannes," etc.	men whistling by which we mean to calm various animals groaning of the sick by which we imagine their pain	voices of animals "cra cra"	lion roaring oxen lowing

gories that the fourfold division generates. On the one hand, birdsong is deemed "inarticulate" but can be written down in letters; the song of the crow is thus 01. This tallies with the inclusion of birdsong within the *confusa* category in the twofold division, for example, in Probus Minor's *Instituta artium*. The meaningful nonlinguistic utterances of men, on the other hand, would be classified as "articulate" but just not writeable, that is, 10. As the binary classification reflects the perceived hierarchical nature of the species 10 and 01, the meaningful nonlinguistic utterance of men far outranks the musical sounds of birds. This is a necessary change in the ranking of rationality and writeability, which were mutually defining in Probus but were teased apart in Priscian.

When "articulate" had meant writeable with letters of the alphabet, illiterate but meaningful sounds—human whistling or groaning—were *vox confusa*, and thus, once musical notation had been invented, they were separated from, and inferior to, musical sounds in music theory. This would mean that although whistling and groaning have discreteness in the sense of having a rationally appreciable meaning, because such sounds do not contain discrete pitches they would rank below not only spoken or sung language but also below the languageless, nonrational, but musically ratioed song of birds. Meaning is now privileged over writeability, making the simple interchangeability of these in the twofold version no longer acceptable. In particular, the placement of *phthongus*—tuned sounds—in the top category leaves open the question, What do such nonlinguistic sounds mean? By implication they mean what we find in the fourth-century author Lactantius, who writes that "all those things which lack words, *i.e.*, the sweet sounds of the air and of strings, may be easily considered of small worth, since they do not stick, nor can they be written. A composed song (poem), however, seizes the mind and drives it where it wishes."⁵⁴ The new supremacy of *verbum* as the defining feature of articulate sound in fact manifests itself in two ways: first, the utterance must itself be verbally meaningful (and not just rational because its pitches are numerate or literate); second, it must be generated intentionally from the *sensus mentis* of a rational utterer, which means that he or she must be human and self-consciously deploying the faculty of reason. Guido himself tries to guarantee rationality in the second way, as I will show. Those music theorists who deploy the four species of Priscian, however, are faced with a problem: Where can musical sound go when it conveys a less clear verbal meaning than groaning but must be more praiseworthy than birdsong? The solution involves ignoring music's musicality altogether.⁵⁵

54. "Nam illa omnia quae verbis carent, id est aeris et norvorum suaves soni, possunt facile contemni, quia non adhaerent nec scribi possunt. Carmen autem compositum . . . capit mentes et quo voluerit impellit." Cited in Lawrence Gushee, "Questions of Genre in Medieval Treatises on Music," in *Gattungen der Musik in Einzeldarstellungen: Gedenschrift Leo Schrade*, ed. Wulf Arlt, Ernst Lichtenhahn, and Hans Oesch. (Bern, 1973), 386.

55. *Expositiones in Micrologum Guidonis Aretini* (ed. van Waesberghe), 164. The commentator then goes on to say (169): "I have said [Guido's notational system] is very useful; therefore, so

apart from linguistic utterance—is almost identical, although “pater” and “mater,” rather than “Petrus” and “Martinus,” are his examples of literate articulate *vores*.⁶³ The only theorist whose example for the literate and articulate *vox* proper to *musica harmonica* is potentially a pitched note rather than a spoken word is Johannes de Olomons, who illustrates the category with the solmization syllable (*vox*) “mi.”⁶⁴

Between Marchetto and the sixth-century Priscian—who does not mention musical sounds specifically—there is only one difference. As an example of *vox* that is both articulate and literate, where Marchetto gives names, Priscian cites a line of poetry: “arma virumque cano.” In giving the opening of the *Aeneid* (metonymically for the entire work) as the example of the only kind of *vox* that is the subject of *grammatica*, Priscian signals that a canonical literary work is the object of linguistic investigation and that literary language will be the main object of knowledge in grammatical discourse.⁶⁵ Although this is the opening of a poem whose performer claims to be *singing* (“cano”), for Priscian, singing and speaking meet in poetry. Marchetto instead chooses prosaic words—the Latin names for Peter and Martin—but he surely does not mean to imply that the main objects of musical discourse are people, unless the names are standing for chants praising those saints. Perhaps for Marchetto, mentioning sung poetry would only muddy the water, since the key component of *musica harmonica*—of literate and articulate singing—has nothing to do with singing and everything to do with words. In short, singing has words that are sung.

Marchetto’s commitment to the linguistic status of singing means that he writes down birds’ nonsense *words*, truly inarticulate but literate *vox*. While the words of birdsongs may be writeable, these words are inarticulate—meaningless—so that birdcalls are not really singing, strictly defined. In making this distinction, Marchetto is implying that birds make confused *vox*, just as

63. Bonaventura da Brescia, *Brevis collectio artis musicae* (ed. Seay), 4.

64. Johannes de Olomons, *Palma choralis* (ed. Seay), 5–6.

65. Irvine, *The Making of Textual Culture*, 95–96, has read this as the subversion of any lingering Platonist claim that speech is better than writing. The placement of singing (“cano”) in this central place, however, signals not, as he maintains, that speech bears the imprint of writing, but rather that this writing is the imprint of sonic vocal performance; not, as he avers, that articulate speech is the special manifestation of writing, but rather that writing is a special (visual) manifestation of articulate speech. Irvine notes that whatever is read is *vox articulata*, but this is because reading means reading aloud—speech—at this period. As he claims, speech and writing are dual manifestations of a single activity—the production of meaning in scriptable units—but this activity’s phonological conceptualization until the ninth century has been argued by Law. Incidentally, Irvine mentions that Christian writers sometimes substitute their own canon, giving the example of Murethac using the opening of Caelius Sedulius’ *Carmen paschale*. It should be noted that like the *Aeneid*, this is identified as a song—as a sonic *vox*, whose written imprint allows it to be studied as *grammatica*. On silent reading, see Paul Saenger, *Space between Words: The Origins of Silent Reading* (Stanford, 1997); for the prevalence of reading aloud, even in the later Middle Ages, see Joyce Coleman, *Public Reading and the Reading Public in Late Medieval England and France* (Cambridge, 1996).

Probus does explicitly in his *twofold* division. Interestingly, Marchetto’s sources have the crow and what may well be a frog noise rather than the cuckoo here, which would give *two* examples of voices that are not even discretely pitched. This is to say that even if literate were to mean that the pitches could be written in musical letter notation, neither the crow’s caw nor the frog’s croak could be thus depicted. This makes their nonmusicality work regardless of how one understands writeability and regardless of whether the verbal or the musical component of sound is the focus. Marchetto amplifies the example by specifying that this kind of sound is that of birds’ voices, and so he omits the frog. All copies of his treatise represent the crow’s caw, but some versions also have the cuckoo as an example. The picture is complicated by the fact that the cuckoo *does* have a song that is discretely pitched and can clearly be written in music notation, as it appears in several fourteenth-century musical pieces.⁶⁶ Of relevance to the current discussion is that in the context of Marchetto’s explanation the cuckoo works as an example only because the focus is on the verbal *onomatopoeic* representation of the call in letters. This aids his point that the only rationality is verbal articulacy; discrete pitches alone do not count (and are not even mentioned). In this he seems to have transferred the grammarians’ distinction between the perceptible form of the word (written or sonic *vox*) and its semantic content (*verbum*) onto music wholesale. All sounds have the former, but only language has the latter as well. Whether it is performed in the heightened speech of song, simply read aloud, or merely seen recorded visually in letters is simply a matter of its medium, not its identity.

Appendix 1.2 shows overlaid examples of the two sets of grammarians and music theorists—those dividing sounds into two principal voices, and those making a division into four species by separating semantic content and writeability. A number of sounds appear in different columns depending on the writer in question. In effect, the variety of placement for these kinds of sounds shows the limitations of each kind of system that the grammarians and those music theorists who used grammatical terminology employed. There is no disagreement at the two ends of the table: the words of human language are 11; inanimate natural sounds are 00. In addition, the voices of all animals other than birds are also 00.⁶⁷ So birdsong effectively has its own category: 01. The category 10 seems designed to elevate the nonlinguistic vocal utterance of humans above the musical song of birds. The instrumental sounds that had occupied the articulate category of the twofold division are now absent except in Ciconia’s treatise, where the modulation of strings is assigned to 10 on the

66. The cuckoo’s song was a byword for repetitiveness and tedium, the cuckoo a frequently used symbol of the boring singer. See chapter 3.

67. In terms of the common division of the nonhuman animals into four groups—derived ultimately from Varro but found in Isidore and widely utilized in the Middle Ages—the grammarians between them cover three: the serpents, the birds, and the beasts. Only the sea-dwelling creatures are missing. See note 18.

basis that it articulates a "certain number of syllables" (discrete pitches). This implies that if discrete pitches made by human art were combined with verbal text, they would occupy category 11; but since spoken language is already 11, the presence or absence of discrete pitches is immaterial to the definition of singing. Tellingly, human singing is not mentioned explicitly.

In fact, this need for verbal rational ideas in music even makes its way back into those theorists who divide the voices into only the two principal ones and make the comparison using birds renowned for their performances. The *Summa musicae* (ca. 1300), subtitled a "Manual for Singers" by its modern editor, having defined music as a discrete arrangement of sounds, states that the word "discrete" should be applied strictly.⁶⁸ If it were to mean merely distinct or distinctly made, "then music would also be the fit property of irrational creatures like the birds which distinguish clearly between the different sounds in their song." Once this is understood strictly, only man can truly be said to sing: "For Man is the only creature that sings and performs other actions with rational judgment [*cum discretione*]. We say that the nightingale [*philomela*] 'sings,' so too the parrot, the lark, the blackbird, the crane, the swallow, the cock and birds like these, but they only sing when they are prompted or urged by Nature. Man, however, sings with discretion, joining words to his song with well-formed sense [*cum discretione cantat, sed cantui suo perfecte sententiae verba coniungit*]."⁶⁹ This is one of the few music treatises to interpret "discrete" as meaning "articulate of a rational idea" (pertaining to a word's *verbum* rather than its *vox*). This means that the agent must be rational and must manifest that rationality in an understanding of practice and in the use of language. Theorists would not be at such pains to stress the rationality that must inform human musical practice if the sound of birds' songs were not ostensibly musical. That the singing of birds is less worthy than human singing "whatever sounds they sing" may be an oblique reference to the supposed rationality of discrete pitches, which some birdsong also patently possesses. It was important that the boys being instructed by the *Summa musicae* did not mistake the discrete song of birds for the kind of human discretion that was required of them.⁷⁰ And this is because meaning is defined as verbal or linguistic in content, and thus a melody, for all its numerical rationality, is meaningless without text.

Birdspeak

But even a text was not enough. Words, like rational-sounding pitches, can be deceptive when perceived solely by the ears; both could be the product of imi-

68. *Summa musicae* (ed. Page). A later dating ca. 1300 for this treatise than that of Page is convincingly argued in Michael Bernhard, "La *summa musicae* du Ps.-Jean de Murs: son auteur et sa datation," *Revue de musicologie* 84 (1998): 19-25.

69. *Summa musicae*, 64, 151-52.

70. Note that he does not consider it indiscrete in terms of sound, but neither does its untexted nature make it inarticulate, only illiterate. This places it in category 10, implying that texted music would be 11 (cf. the implication in Johannes de Grocheio, discussed later in this chapter).

tation. Ultimately, both are just particular types of sound: language too is just a sonic property. Dante notes this for spoken language, specifically using birds as exemplary material:

And if it be claimed that, to this day, magpies and other birds do indeed speak, I say that this is not so; for their act is not speaking, but rather an imitation of the sound of the human voice—or it may be that they try to imitate us in so far as we make a noise, but not in so far as we speak. So that, if to someone who said "pica" [magpie] aloud the bird were to return the word "pica," this would only be a reproduction or imitation of the sound made by the person who uttered the word first.⁷¹

The choice of a magpie may have made the example particularly clear to his audience, as magpies were kept in captivity during the Middle Ages precisely for their ability to imitate human speech.⁷² It is also a bird that, unlike most songbirds, is commonly found in Latin bestiaries, which often quote a Martial epigram:

Pica loquax certa dominum te voce saluto
Si me non videas esse negabis avem

I, a chattering pie, shall salute thee my master with my intelligible voice; if thou sawest me not, thou wouldst deny I were a bird.⁷³

This confirms the unreliable character of auditory sense perception, which would lead someone relying on it alone to assert something patently untrue (that a bird is not a bird), and the greater power of vision. Magpies are said by Isidore to resemble poets because of their ability to speak with intelligible voice. The backstory to this comment may be book 5 of Ovid's *Metamorphoses*, in which the human daughters of Pierus and Equippe (the Pierides) are changed into magpies after losing a song competition with the muses (who then take over their cognomen).⁷⁴ This implies a negative view of human performance as a poor imitation of the godlike, signaled by an unnatural reverse mimesis—a bird imitating human speech.

The magpie is also one of the birds mentioned by the master in Augustine's *De musica* as being capable of imitation. The student thinks that even though

71. "Et si dicatur quod pice adhuc et alie aves locuntur, dicimus quod falsum est, quia talis actus locutio non est, sed quedam imitatio soni nostre vocis; vel quod nituntur imitari nos in quantum sonamus, sed non in quantum loquimur." Dante, *De vulgari eloquentia*, 4-5.

72. See Brundson Yapp, "Birds in Captivity in the Middle Ages," *Archives of Natural History* 10 (1981): 482.

73. Martial, *Epigrams* 14.73, cited in F. MacCulloch, *Medieval Latin and French Bestiaries* (Chapel Hill, 1960), 142-43, translation adapted.

74. "Magpies are like poets because they pronounce articulate words like a man." (Picae quasi poeticae, quod verba in discrimine vocis expriment, ut homo.) Isidore, *Etymologies*, 12.7.46.

flute and lyre players learn from imitating others, they should be considered practitioners of the art of music:

D. For imitation seems to me to be so much a part of the arts that, if it is removed, nearly all of them are destroyed. For masters exhibit themselves to be imitated, and this is what they call teaching.

M. But don't you think art is a sort of reason, and those who use art use reason? Or do you think otherwise?

D. It seems so.

M. Therefore, whoever cannot use reason does not use art.

D. I grant that, too.

M. Do you think dumb animals, which are also called irrational, can use reason?

D. Not at all.

M. Then, either you would be forced to say magpies, parrots, and crows are rational, or you have been pretty rash in calling imitation by the name of art. For we find that these birds sing and make many sounds because of their intercourse with human beings, and that they utter them only by imitation.⁷⁵

Again Augustine emphasizes that the perceptible sensual qualities of song alone do not make it music. As we saw in the discussion of *vox* from the grammarians, the seemingly discrete "musical" properties of a song are a necessary but not sufficient condition for medieval musicality; but the seemingly human song and speech of the other birds shows that even the apparently rational and articulate linguistic properties of spoken language may also be a deception if the listener relies just on aural sense data. Only the deployment of the human capacity for rational understanding (*scientia*) in the production of the sound can guarantee its musicality, and this is something that is not contained in the sound alone, whether in its musical pitches or in its verbal text; in fact, it must be adjudged by the listener from action entirely separate from listening.⁷⁶

A similar conclusion can be drawn from the shifting place of the *sibili* (whistling or hissing) and groans among music theorists. They are *io* in the four-voice division as compared to the *oo* placement that they effectively merit in the two-voice grammarians. The contrast is clearest between Johannes, Jerome, and Aegidius (for all of whom groaning is indiscrete, effectively *oo*) and Marchetto, Ciconia, and Bonaventura (for all of whom it is *io*). Similar kinds of indiscretely pitched vocal sounds made by animals—the *sibili* of snakes, for example—are *oo*. In both snakes and humans the sound is a *sibilus* but the value of the sound is affected by its meaningfulness, which is in turn

75. Augustine, *On Music*, 178; *De musica*, 16, 18.

76. It would have been possible to note as unique the combination of tuned pitches and language that pertains to human song, yet the treatises do not mention it. This definition is implied, however, in the romances of the Middle Ages that feature magical birds able to sing meaningful verbal texts with rationally tuned pitches. See especially *Le chevalier du papegau* (ed. Heuckenkamp); *The Knight of the Parrot* (trans. Vesce); and my own discussion in chapters 2 and 6.

generated by the nature of its agent. The situation is identical for the sung voices of birds and men; only human singing is singing since only humans can mean. The agent and her or his rational engagement in the action are crucial.

The very oddity of this conclusion for the modern musician should caution once again as to the very different hierarchies of knowledge that are in play in the Middle Ages, and the different remit and relation of *musica* and *musicus* to more recent notions of music and musician. The quality of a song—its sounding performance—does not differentiate the bird-brained imitator from the rational, thinking artist. To the extent that the words of a song are just sounds, these too may be imitated without intention or reason. Ultimately the practitioner of *musica harmonica* is distinguished by his ability to *understand* the measure and numbers of music, something he may implicitly demonstrate, but not explicitly prove, in the act of singing.

Rational Performers: *Musici*

Guido of Arezzo used an alternative guarantee of rationality to the stipulation of verbal text; in fact, he used a better one, and one that became standard for later theorists whether or not they also specified the necessity for music to carry rational meaningful verbal text. Guido effectively invented the idea that not only should the singer be human but he should be artful as well, since practicing art guarantees humanity rationality.

The precedents for Guido's rhetorical move have been seen in the Platonic elevation of artistic understanding in Augustine and Boethius. The essentially Platonic view of Boethius' senatorial class led to his ascription of more honor to those "gentleman-connoisseurs" (like him) who judge song through its contemplation, than to either those poets who, through natural (that is, nonrational) instinct, produce songs, or to those quintessentially "manual workers" who play instruments.⁷⁷ This distinction relies on those that existed in a society where owning slaves and employing servants enabled the free man to pursue what were therefore called the liberal arts, music among them. Boethius comments that "reason's contemplation of working does not need the deed, while the works of our hands are nothing unless guided by reason."⁷⁸ This is why performers take their names from their instruments.

In both Augustine and Boethius, however, the act denigrated is that base mechanical act of *instrumental* performance.⁷⁹ Guido redraws this tradition to

77. See Christopher Page, "Instruments and Instrumental Music before 1300," in *The New Oxford History of Music: The Early Middle Ages to 1300*, ed. Richard Crocker and David Hiley (Oxford, 1990), 456.

78. *The Early Christian Period*, 32.

79. See Page, "Instruments and Instrumental Music before 1300," 456. The Platonic late antique view of performance as manual activity and thus not free resurfaces again in the later Middle Ages as scholars engage more with Aristotle's *Politics* and *Nicomachean Ethics*. From Jerome on-

take account of the changed social aspect of the Christian West, in which daily singing of sacred Latin is a mark of literacy and gives educational access to the liberal arts. Boethius' threefold hierarchy was based on distinct social classes: a *musicus* was a free man, pursuing the liberal art *musica*, from which he takes his name; the poet was only a natural performer; and the instrument player—a mechanical, named after his instrument—was a mere slave. Guido rewrites this as a simple binary opposition between the practicing *cantor* and the theoretically informed *musicus*. Both types are singers, and by implication both types are monks, but the *musicus* is the one who will be formed by, or profit from, the teaching of Guido's treatise. The *musici* are not a separate social set but rather a more praiseworthy subset of the *cantores*.⁸⁰ The famous opening verses of Guido of Arezzo's *Regulae* are cited, often verbatim, by many later theorists, and clearly, like most meters, were didactic verse to be memorized by young singers:

Musicorum et cantorum magna est distancia
Isti dicunt illi sciunt que componit musica
Nam qui facit quod non sapit diffinitur bestia.

Between musicians and singers there is a vast distance: the latter perform; the former know what music comprises. For he who does what he does not understand is termed a beast.⁸¹

What separates the two groups is distance (*distancia*), suggesting that they are on the same continuum. With the right learning and application (or, in the other direction, through neglect), this distance is potentially traversible; it is a difference of quantity, not, as arguably in Boethius, quality. The *cantor* is no better than an animal, a beast, because he has failed to employ his human reason.

In Johannes' slightly later treatise, which to some extent glosses and commentates on Guido's more famous *Micrologus* (to which the *Regulae*'s famous opening meters are often erroneously ascribed by later theorists), this sentiment is expanded with two examples.⁸² First, the *cantor* who lacks a rational basis to his practice is compared to a drunkard who finds his way home only by habit and has no idea how he got there. Like a beast, a drunken man is di-

ward they begin to cite once more the Boethian threefold division. (NB: The use of *cantare* in Augustine's discussion of flute players should be translated as "to perform"—i.e., on the flute—and not "to sing," as is found in the published translation.)

80. The permutations of the *cantor-musicus* trope from Boethius to Zarlino are outlined in Erich Reimer, "Musicus und Cantor: Zur Sozialgeschichte eines musikalischen Lehrstücks," *Archiv für Musikwissenschaft* 35 (1978): 1–32.

81. Guido of Arezzo, *Regulae* (ed. and trans. Pesce), 330–33, translation adapted.

82. Johannes, *On Cantors* (trans. Babb), 105; *De musica cum tonario* (ed. van Waesberghe), 52. See also chapter 4.

vorced from his capacity to reason and understand. Second, Johannes points out that even an inanimate object like a mill wheel may make a discrete sound by accident, so that even if a singer is producing what seems like good singing (finding his way home), unless he knows the rational principles that underlie it, he is no better than a beast or a drunkard. This *cantor* is Augustine's ostensibly musical nightingale—which may be worthy of praise as a nightingale but not as a human.

In the fourteenth century, Jacques of Liège reports Guido's judgment in the context of the fourth of four divisions that he makes within the Boethian category of *musica instrumentalis* (sounding or performed music), that between practitioners and theoreticians.⁸³ He explains that neither the beast nor the *cantor* sings from understanding but both sing rather from "use"; like that of a beast, the *vox* of the *cantor* is a habitual reflex:

But practice [*practica*] is also concerned with animals, birds, snakes, and some fish. And among human beings many are practitioners, but few are theorists. The singer [*cantor*] who has only experience [*usus*] stands, as some say, to the true musician [*musicum*] as a beast to a human being; whence the saying:

A beast not a singer is he that sings not by art but by experience,
It is not the voice that makes the singer but proof of art.

But we do not wish so to extol theory [*theoricam*] as to push practice too far down; it is not without its praises, and we have already touched on the commendation of music; for there are many commendable states that fit together, as was said there.⁸⁴

The two terms *ars* and *usus* are found frequently in treatises from the later Middle Ages and imply a hierarchy of terms within a further binary opposition that maps neatly onto that of *musicus* and *cantor*. The mere singer sings *per usum*, by habit of practice alone, and not because of rational understanding of the rules. The true musician, operating *per artem*—through "art"—is, by implication, the artificial practitioner. Also by implication this values art over nature, elevating the rational *fictio* that man can achieve over the nature that he imitates. Privileging artifice in this way agrees with Boethius' denigration of the little-used middle category between the *musicus*

83. The other three divisions Jacques makes are, first, between measured music and plainsong (from Franco); second, between harmonic, rhythmic, and metrical music (from Cassiodorus, probably via Isidore); and third, an ethical division between modest and lascivious music. On the last of these, see chapter 5.

84. Jacques de Liège, *Speculum musicae*, 1:64–65, referring back to chap. 5, sections 9–10. Translation by Leofranc Holford-Strevens. The two verses here were very widely copied and often follow citation of the first three lines of Guido's *Regulae*. They are also quoted in John of Tewkesbury, *Quatuor principalia* (ed. and trans. Aluas), 541, and the treatises in the tradition of Johannes Hollandrinus, *Opusculum de musica*, 86–87.

and *cantor*, the poet who works by natural instinct alone, and who is thus not dignified by exercise of his intellectual faculty in the composition of songs. The devaluation of “natural” affects birds, which are compelled to sing by nature alone; they are the mere *cantor*, and the *cantor* is by inference bestialized as a merely natural singer. Augustine’s treatise comments that the nightingale (*lusciniā*) sings only naturally (*solam naturam*); it resembles the artless players of woodwind and stringed instruments, even though they produce sweet-sounding songs.⁸⁵

In the two lines immediately following Guido’s opening verses cited earlier, the nightingale is mentioned specifically:

Ceterum tonantis vocis si laudent acumina,
superabit philomelam vel vocalis asina.
Quare eis esse suum tollit dialectica.

Furthermore, if one praises the loudness of a thundering voice, even a jenny [she-ass] in full bray will surpass the nightingale, on account of which logic declares that they lack their essence.⁸⁶

Guido’s bestialization of the irrational singer perhaps suggested to him the illustration using the contrasting “songs” of the jenny and the nightingale. After all, the nightingale has resonances of beautiful song, and in the eleventh century as *philomela*, the written Latin nightingale, is a laudably sacred bird.⁸⁷ The ass by contrast usually derives its name in medieval etymologies from either its servility or its lack of senses; it is described as naturally stolid, stupid, oblivious, and slow.⁸⁸ For present purposes the contrast between the sounds of a quadruped and a bird is instructive. It implies that the bestial *cantor* is not able to judge vocal quality but will be fooled by quantity (volume). Condemnation of bellowing is found in a number of writers and becomes associated with the inappropriate individuation of singers in the communal expression of

85. Augustine, *De Musica*, 16.

86. Guido of Arezzo, *Regulae*, 330–33. Translation by Holford-Strevens.

87. See Jeni Williams, *Interpreting Nightingales*, chap. 2; and my own discussion in the next chapter.

88. See, for example, the entry on the ass in Johannes Aegidius de Zamora, *Historia naturalis* (ed. and trans. García and Ballester), 1226–34, who cites from Avicenna, Aristotle, and Pliny. The etymology is Isidore’s. The verb for its sound (*rudere*) further indicates its crudeness, and the resulting cry is usually described as “horribilis.” In British English it is a metaphor for stupidity; in recent times in American English its chief meaning has become the body part to which it originally only metaphorically, euphemistically, and periphrastically referred. See the introduction to Jan M. Ziolkowski, ed., *Obscenity: Social Control and Artistic Creation in the European Middle Ages* (Leiden, 1998).

the liturgy that chant embodies.⁸⁹ But the contrast goes beyond the explicit issue of volume to touch implicitly on the pitch content of these two animal voices—which is where our whole discussion of the rationalization of sound started. In medieval classifications, the braying of an ass is a sound that, like the noises made by all quadrupeds, is *vox confusa*; it cannot be written down, and it does not mean anything. It is thus the kind of indiscretely pitched sound that is not proper to music.⁹⁰

Guido’s nightingale is a positive contrast to the jenny, but, as even the student in Augustine’s dialogue knows, it is still a bird. Guido’s focus is on the listening human musician’s ability to distinguish good singing from bad and confused sound from the kind of discrete sound that is proper to music. This makes the human judge, and not the nightingale, a *musicus*. The treatise is focused on teaching the human singer the principles that will make his song rational; nothing can make the nightingale rational, as it is a bird. What the human practitioner must avoid is getting the song right without understanding; and showing that he has the ability to judge and explain why the nightingale’s song is better than the jenny’s braying will act as a marker of possessing such understanding. This understanding specifically involves “logic,” another term for grammar. Compressed into this example are the two “spaces” in which rationality inheres, not always clearly separated in medieval discussions: first in the song itself, and second in the rational human agent’s understanding of the song’s rationality. Moreover, the first of these sites manifests that rationality in two ways, one musical and one linguistic. The song can have discretion in the sense of “transmitting a rational idea,” which pertains to the linguistic utterance of the words being sung, which belong to human language. Or the song can be understood analytically as comprising ratio-derived intervals giving discrete pitches, which pertains to the nonlinguistic musical aspect of the song itself. These two forms of discretion—*grammatica et cantus*—are united at the level of their descriptive, technical languages since the notation of musical pitch shares a vocabulary with the notation of spoken language. In practice—given that these monks are singing ecclesiastical song—their song

89. Sarah Fuller, “Organum-discantus-contrapunctus in the Middle Ages,” in *The Cambridge History of Western Music Theory*, ed. Thomas Christensen (Cambridge, 2002), 478. “Prior to discanting above plainchant, the theorist [of *Cum notum sit*] says, a singer must master the realm of *cantus planus* (which encompasses both theory and practice) and must temper his voice so that it is not too assertive or loud.” See also the comments collected in Timothy J. McGee, *The Sound of Medieval Song: Ornamentation and Vocal Style According to the Treatises* (Oxford, 1998), 17–20; and my discussion of Jacopo da Bologna’s madrigal *Oselletto* in chapter 2.

90. This impropriety was played with by the subdeacons at Beauvais in their celebration of the Feast of the Circumcision, at which “song of the Ass” was performed; see the facsimile in Nicolas Bell, *Music in Medieval Manuscripts* (London, 2001) 34–35. The refrain is mimetic not of braying, as is often stated, but rather of the handler’s goading the animal onward; see Richard Holbrook, “Hez! Hay! Hay Avant! and Other Old and Middle French Locutions Used for Driving Beasts of Burden,” *Modern Language Notes* 20 (1905): 113–22.

should have both. Because both forms of discretion can be produced by a bird, however, human performers should mean and understand both, exercising rational ability in a way the bird cannot (since it does not possess it). The human *cantor* who is ignorant of either form of rationality in sung language is beast-like in that ignorance, however rational his song may sound. The mark of the *musicus* is to understand music's natural rationality by means of "artificial" human reason; to mean his song and to perceive meaning that is truly meant, rationally, in the songs of others.

As music theory is written to instruct readers in the art of music, it is perhaps not surprising that nearly all treatises cite or paraphrase either Guido's mnemonic verses or those, quoted earlier, by Jacques of Liège. This verse exemplum functions as both carrot and stick—a carrot to encourage the jenny to traverse the distance between the *cantor* and the *musicus*; the stick to beat her if she does not. They are the metrical equivalent of the pictorial mnemonic that forms part of the same instruction, the Guidonian hand, which symbolizes the manual dexterity that separates choirboys from the animals but perhaps also threatens to punish those who depart from the rationality it depicts.⁹¹ Those learned in *musica* and named for their art as *musicus* must consider as beasts those singers who fail to understand the rules pertaining to the letters and notes (*voces*) that govern musical practice, whether or not they consistently sing discrete pitches.

Human singers were sometimes also reminded of their duty to be *musicus* by a common manuscript drollery, the music-playing animal (also found in sculpture and misericords). Combining animals with musical instruments fuses two types of sound of which human language is not a part: the *vox confusa* of beastly voices and the languageless *sonus* of plucked or blown instruments. Figure 1.3 shows a number of beast musicians, including a harp-playing ass, decorating the Beatus page of a Psalter. This opening page is named for the initial word of the first psalm—the psalms being the most frequently sung texts of all. Integral to the singing of the Hours, the complete round of psalms was sung each week in monasteries and was the chief reason for theorizing musical practice, particularly through classifying mode. The Beatus page was often decorated and is also a common place for the depiction of birds, as can be seen in figure 1.4 from the Arundel Psalter. The presence of beast musicians serves as a more lighthearted graphic reminder to reading singers not to jeopardize their human rationality by loud individuated singing and ignorance of *musica*. In the orthodox classification of birdsong, the birds would serve much the same purpose. The visual juxtaposition of the harp-playing ass and the harp-playing David, the *ur-musicus* and the Lord's anointed, makes singers' possible pretensions absurd: in their bid to imitate nature's beauty in song, warns the image, rationality should not be forgotten.

91. See Holsinger, *Music, Body, and Desire*, 267–79, esp. the picture on 277.

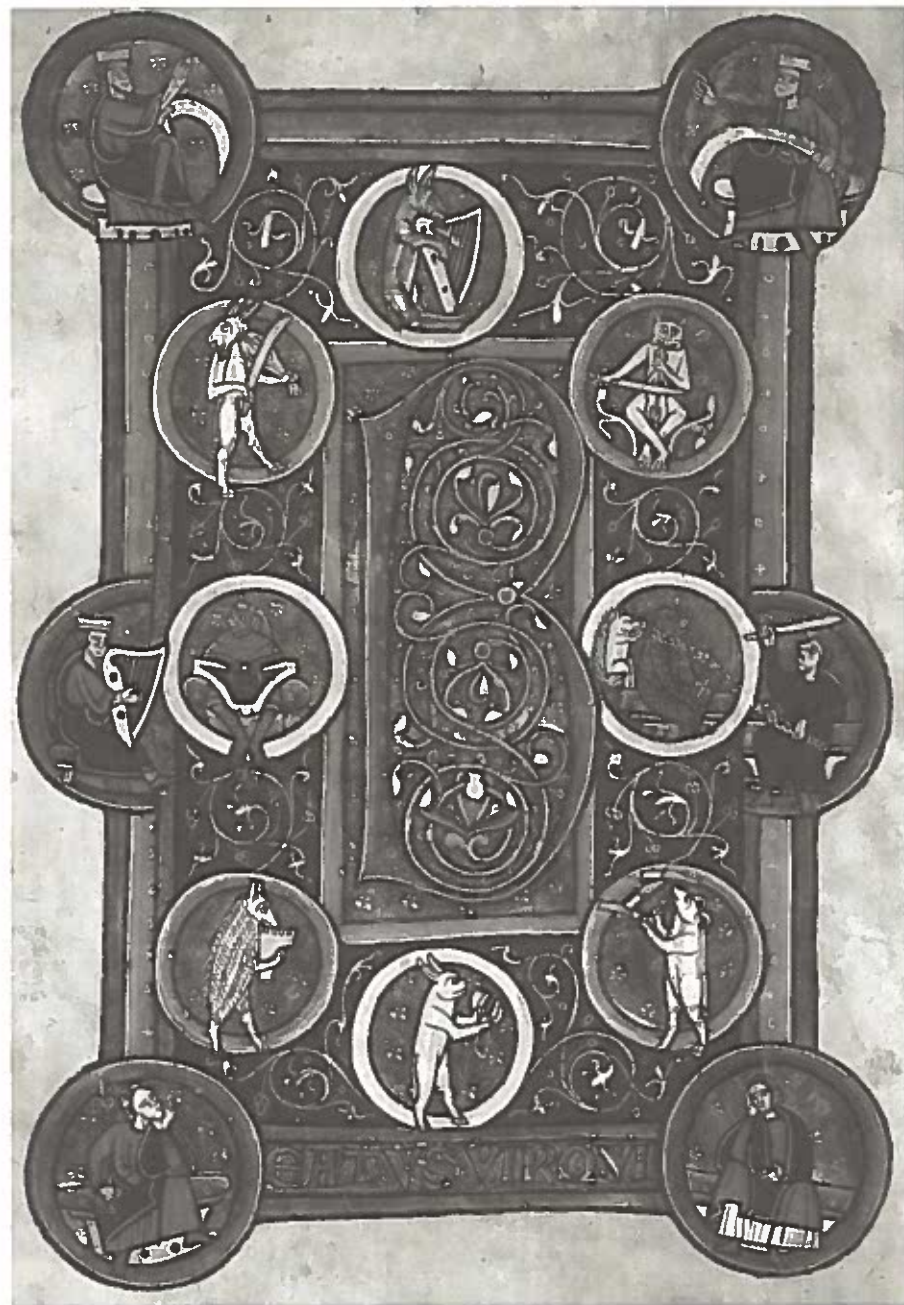


Figure 1.3. Beast musicians on a Psalter Beatus page from GB-Lbl Lansdowne 420, f.12v. By permission of the British Library.

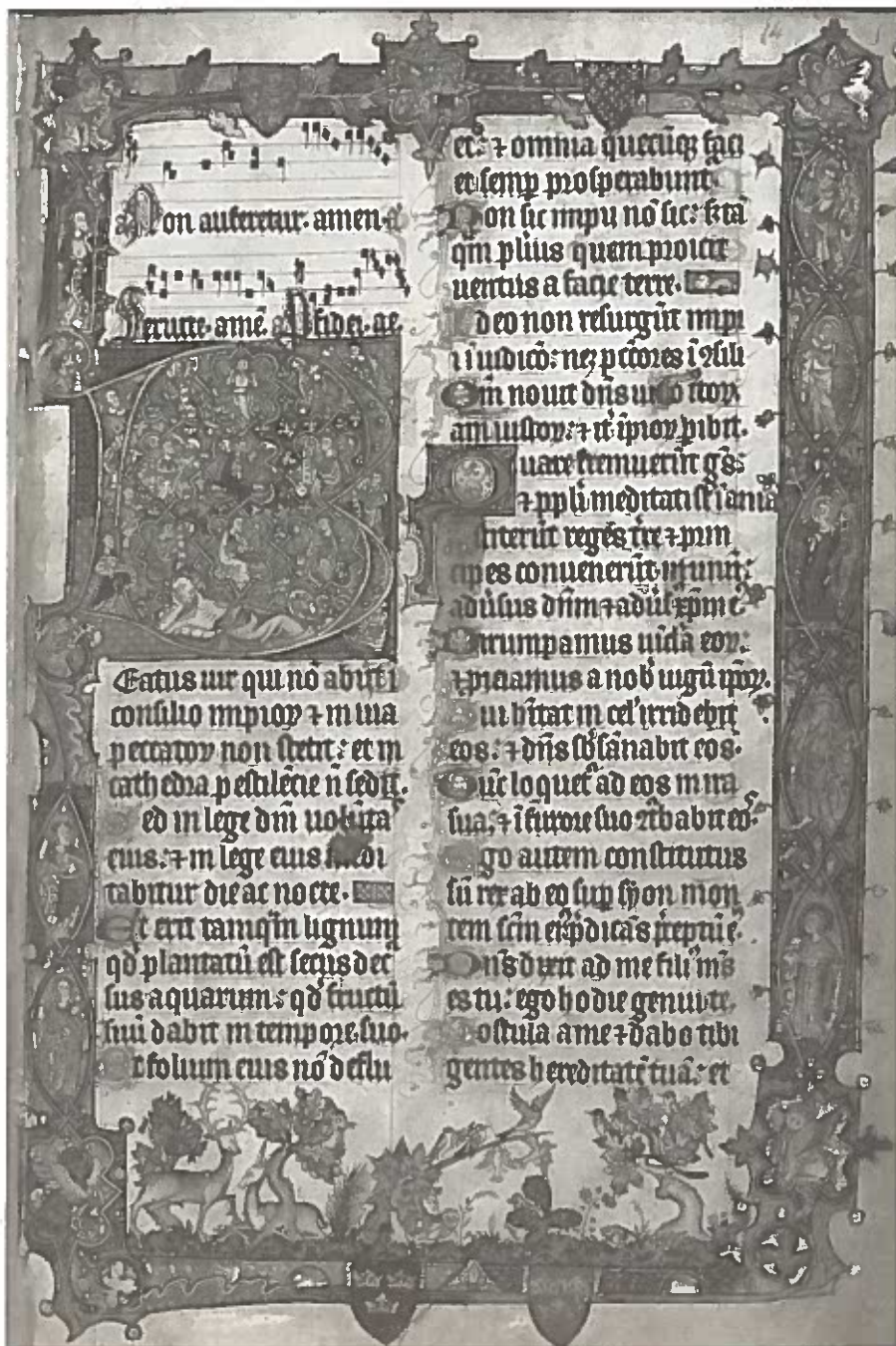


Figure 1.4. Birds on a Psalter Beatus page from GB-Lbl Arundel 83, f.14r. By permission of the British Library.

In summary, it remains to draw together some of the various ways in which human singing is situated within the larger category of sounding music (*musica instrumentalis*), and the ways in which this intersects with *musica* as a broader category, on the one hand, and sound, including the sounds of spoken language, on the other.

First, musical sound is understood much as other kinds of sound are classified within grammar. Correctly performed human singing is not differentiated from spoken language. The rationality of this type of verbal linguistic sound is shown in its writeability and its articulation of rational meaning. In some grammar texts, these two categories—writeability and articulacy—are further divided. The former pertains to the nonlinguistic aspect of sound. In grammar books such sound is invariably isolated by being specified as that performed on instruments; there and in music theory (where it can pertain to singing, although singing is often taught using a stringed instrument, the monochord), it tends to be classified as discrete in the sense of articulate since it articulates interval ratios. When a notational system is developed for pitch, it perpetuates the links between *grammatica* and *cantus* by representing sung notes with written notes, consisting of letters and syllables. Now music, too, can be expressed with letters. As discrete musical sound becomes identified with the discrete diatonic pitches that can now be written, theorists encourage human singers to distinguish themselves from the beasts—and from the bestialization that ignoring theory will bring—by knowing about music and understanding the rational basis of their practice. From his song alone, however, the rational *musicus* is not distinguishable from the bestial *cantor* or from songbirds, both of which produce numerate-sounding song, but song made through imitation or natural instinct. What separates the *musicus* from the birds is the linguistic articulation of rational verbal meaning; what separates the *musicus* from the *cantor* is knowledge (*scientia*) of the art. As the song's actual sound does not attest to the rationality of its agent, the latter, like *musica* itself, cannot be known by sense perception alone but requires reason on the part of the listener (who may also be the singer).

Aegidius of Zamora acknowledges that the term “discrete” has two different senses in his description of the difference between discrete and indiscrete sounds. Discrete sounds, he says, are those in which there is both discretion (*discretio*) and *consonantia* (discrete pitches). His complementary pairing indicates that he is using discretion in the sense of “articulate verbal meaning.” As examples of indiscrete sounds—lacking both articulate verbal meaning and discrete pitches—he gives human laughing and groaning and, for artificial instruments, cymbals, drums, and the sistrum. Whether made by art or by nature, he states, *musica* is not properly made up of such indiscrete sounds.⁹²

Clearly the orthodox position is that rationality in singing—proper praiseworthy human song—requires both forms of discretion, but it should be noted

92. Johannes Aegidius de Zamora, *Ars musica*, 60, 62.

that the music of artificial instruments can exhibit only one. The potential to construe "discrete" (or "articulate") in these two ways offers rational musicians a prospective escape clause, a way of rationalizing song without words. If discrete means not "articulating an idea linguistically" but more "rationally producing discrete articulated pitches," then song can be meaningful and preserve the rationality of its performers, with or without its linguistic content.

The idea that wordless music is illiterate regardless of whether its pitches can be written with alphabetical notation is stated most explicitly around 1300 by the music theorist Johannes de Grocheio. Grocheio is, rather unusually, writing about the musical practices of the laity and about instrumental and dance forms. In talking about a kind of dance song called a *ductia*, he notes that, although it can be made by the human voice and represented with musical notes ("per figuras"), it is a "sonus illiteratus" because it lacks sung text ("littera et dictamine").⁹³ It is "sine littera" in the same sense that certain sections of thirteenth-century conductuses are "sine littera." Perhaps by claiming that the music is just unlettered in this very literal sense Grocheio is implying that it would occupy category 10, alongside groaning and laughter—a meaningful but nonverbal form of human communication.

In trying to establish that human singing is meaningful—articulate—regardless of being untexted, the rationality of sound as heard assumes a great importance. In these terms alone, however, certain kinds of musical-sounding birdsong might be mistaken for singing; such natural performance might provide an inspiration or become an aspiration. In urging the student that such a judgment does not represent a "proper" level of assessment—reason must always guide the ear—Augustine recognizes the level of temptation that birdsong (and the virtuoso instrumental playing of unreflective human practitioners) presents. The subdivision of discretely pitched animate sounds into articulate and inarticulate *vox*, a division that had also been part of the grammatical tradition for centuries, is driven by the same spur as Augustine's treatise: the need to guard against potential assaults on the sacredness of human rationality.

In effect, already laid out here are the two sides of the argument in which the idea of birdsong is central. On the one hand, there are those for whom the link between musical sound and the words it carries is so important that any break is immoral. Singing is just a particular kind of speaking, heightened by

93. Johannes de Grocheio, *On Secular Music* (ed. and trans. Page), 31–32. See also Gushee, "Questions of Genre in Medieval Treatises on Music," 386. The *ductia* is also "cum decenti percussione mensuratus," which Page translates as "with an appropriate beat" and Gushee as "measured by seemly percussion." But Grocheio has just cited Aristotle as authority to the fact that although instrumental sounds are commonly subdivided by the means of production into those produced by blowing and those made by striking, all sound is ultimately the result of percussion. Grocheio's "cum decenti percussione mensuratus" (with properly measured striking) may thus mean that it is discretely pitched (since measure more often pertains to pitch than the "beat" of Page's interpretation) or merely "correctly produced."

an extreme form of intonation relating to public performance. This might be labeled the "chant" position, reflecting an earlier period, pre-notation, when there was no clear separation between the two elements.⁹⁴ It is also exemplified in the objections to textless instrumental music, whether for dancing or for other forms of theatrical display, which characterize a particular strand of invective from patristic writers in the first few Christian centuries, through twelfth-century Cistercians, to Erasmus and beyond. A linguistic grammatical definition for song ("Petrus," "Martinus") suffices, because the pitched melodic element of music is either perceived or deemed to have no meaning aside from the text it carries. It may be that some authorities agreed with Lactantius and found musical melody on its own rather meaningless, but I would argue that they were outnumbered by those who recognized that meaning could be imparted aurally without words—those who, following Priscian, understood the rational-emotional import of groaning, laughter, and sighs. Fear of the implications of this made many want to bind words and music more tightly by not recognizing music without words at all. The problems with music's own language character are twofold: its meanings are rather more open, allowing even more freedom to the listening interpreter than verbal language; and having its own identity allowed the melody to "read" and thus critique its verbal text in a manner that could result in immorality, jeopardizing the souls of the performers and listeners.

On the other hand, there is the idea that birdsong can symbolize a singing that is close to the fact of God's creation, that is natural as opposed to the unnatural excesses of human singers and may be morally neutral or even good. In addition, the musical qualities of birdsong—its quick tempo, rapidity of notes, high pitch, large range, and seemingly infinite thematic variety—are all qualities to which instrumentalists and singers could aspire. Evidence of such appreciation of the potential for sensual enjoyment of discretely pitched, beautifully performed sound without words (whether by *vox* or instrumental *sonus*) can be found, for example, in Jerome of Moray, who stresses the performer's rationality by citing verbatim Guido's verses and Johannes' examples of the drunk and the mill wheel, but goes on to comment that no man's voice should be scorned on account of his lack of learning. Even if he is not a *musicus*, man is by nature a rational creature and might, like the mill wheel, produce the occasional good sound.⁹⁵ Jerome implies that this sound would be worthy of imitation by the *musicus*—a surprising idea, which opens the way also for the imitation of other accidentally pleasing sounds, such as birdsong. A similar interest in sound quality is present in other sources, though usually highly attenuated on account of the need to emphasize rational practice, but vocal

94. On ecclesiastical chant as a unitary mode of expression, see Treitler, *With Voice and Pen*, 437.

95. Jerome of Moray, *Tractatus de musica*, 188. See chapter 4, note 98.

beauty and sweetness, unlike pitch and rhythm, are not accessible “by numbers.” In the next chapter I consider a sliver of theoretical evidence that the presence of human nightingales—instrumentalists or singers who did not conform to the orthodox requirements for being proper musicians—was noted and appreciated.

2

*Birdsong and
Human Singing*

The theological orthodoxy of medieval music theory differentiates the type of *vox* (“voice” or “note”) proper to *musica harmonica* (singing) from the ostensibly musical but nonlinguistic voices of birds on account of the rationality that is natural only to the human animal. Music-theoretical testimony, however, also bears witness to the converse impulse: to praise the good singer’s voice by likening it to birdsong conceived positively as natural music, and to characterize singers as birds. This impulse is not strong, is metaphorical rather than literal, and rarely receives unequivocal expression. The more orthodox anthropocentric view of song outlined in chapter 1 is far more powerful. The “birdsinger” view is present, nonetheless, and is facilitated by a certain duality inherent in the conception and value of nature and the liminal place of humans within the natural world. The contested and problematic *nature of nature*—a dittography which sums up two of the key senses of the word—is fundamental to understanding the potentially disruptive use of birdsong, both as a verbal example and as a mimetic musical one, in relation to human singing. In this chapter I examine the problem of medieval nature, the scraps of evidence for positive accounts of birdsong in both music-theoretical writing and the texts of musical pieces, and the increasing centrality of the nightingale in particular as a means of figuring poetic “singing” in later medieval literary culture as a whole.

Natural Talent and the Liberal Arts

For much of the Middle Ages the oral performance of poems is signaled by two interchangeable verbs corresponding to the verbs *to sing* and *to say*, and