

purposes. Farmer calls this treatise "the greatest contribution to the theory of music up to his time."⁸⁷ But, in actual fact, theorists limited their borrowing from al-Fārābī to the methodological remarks in his *De scientiis* (*Ihsā' al-ulūm* [*Classification of the Sciences*]). This is not, however, as Randel suggests, because "much of what al-Fārābī had written about music did not bear on their personal experience."⁸⁸ For it is clear that a great deal of thirteenth-century European music exhibits strong stylistic affinities with Eastern techniques and contents. Rather, they might have sensed that the theoretical interests of the emerging tonal teleology were taking a different direction.

In the previous pages I have revisited the "Arabian Influence" thesis mainly from the viewpoint of music acculturation and confined the discussion of compatible traits to Western monophony. Other topics that could not be covered here certainly deserve study, including the extent to which stylistic findings in the monophonic literature are relevant to contemporary polyphony,⁸⁹ the function drone techniques played in organum and later polyphony, the position of Spain as the hub of medieval Eastern influences, and the actual process of transmitting and disseminating Eastern musical characteristics in the medieval West. That the future development of Western music lay away from Eastern traits does not belittle the latter's centrality in Europe's early music history. Rather, it hones the perspective for future study.

⁸⁷ Henry G. Farmer, *The Sources of Arabian Music* (Leiden: Brill, 1965), 28.

⁸⁸ Randel, "Al-Fārābī and the Role of Arabic Music Theory," 188.

⁸⁹ Ernest Sanders reminded us that "certainly in the first several centuries of Western *Mehrstimmigkeit* an 'organized' melody, whether it was a chant or a paraliturgical versus, was not thought of as a musical opus of distinct stylistic specificity, but as an elaborated version of that melody" ("Consonance and Rhythm," 264).

Rhythm in Early Polyphony

By Richard L. Crocker

It has been apparent for some time that the rhythm of polyphony before Leonin is not going to be revealed by documents of musical notation or by explanations by contemporaneous theorists. There had perhaps been a belief that there must be some system of rhythm comparable to the modal system, which had unlocked so spectacularly the secrets of Notre Dame polyphony, and that evidence for it would turn up. There now seems little indication that it will: what we see is what we have. I believe, however, that we have everything we need of a documentary nature or at least, given the conditions of early polyphony, everything we could reasonably expect.

During recent years there has been a number of discussions of polyphony before Leonin. Recent studies have concentrated, quite properly, on matters of pitch and have been duly cautious about rhythm. Very few envisage an application of modal rhythm, and the current tendency is to restrict the modal system specifically to Notre Dame polyphony sometime after 1200. Ernest Sanders has reviewed the modal hypothesis at length and has questioned its application to aspects of the conductus.¹ Outside of polyphony, modal transcriptions of monophony have come under increasing attack, especially by Van der Werf² and more recently by Stevens.³ More important than this restriction of modal rhythm is the realization that not all rhythms or systems of rhythm involve precise measurement of individual note durations. It once seemed that musical meter was necessary for polyphony, and that it had come into being for that purpose. Indeed, the transcription of polyphony notated in separate voice parts does require an understanding of durations in a metrical frame of reference. But this does not apply to monophony, and it does not apply to early polyphony notated in score.

¹ Ernest H. Sanders, "Conductus and Modal Rhythm," *Journal of the American Musicological Society* 38 (1985): 439–69.

² Hendrik van der Werf, *The Chansons of the Troubadours and Trouvères: A Study of the Melodies and Their Relation to the Poems* (Utrecht: A. Oosthoek, 1972). I had rejected it in 1966 (*A History of Musical Style* [New York: McGraw Hill, 1966; repr., New York: Dover, 1986], 54–55) and had expressed reservations earlier in a review (*Music Library Association: Notes*, 2nd ser., 11 [1954]: 269) of Friedrich Gennrich, ed., *Troubadours, Trouvères, Minne- and Meistergesang*, Das Musikwerk, no. 2 (Cologne: Arno Volk Verlag, 1951).

³ John Stevens, *Words and Music in the Middle Ages: Song, Narrative, Dance and Drama, 1050–1350*, Cambridge Studies in Music (Cambridge: Cambridge University Press, 1986).

While tending to set aside the question of rhythm, some discussions have included transcriptions that indicate that writer's preference, and others have proposed specific solutions. These range between two logical alternatives as identified, for instance, by Parrish or Hoppin:⁴ on the one hand, we can understand as equal the notes of the more slowly moving part; on the other hand, the notes of the faster moving part. These are abstract alternatives, and neither seems applicable strictly; practical applications exercise varying degrees of flexibility, extending all the way to "free" rhythm.

The approach presented here results in a mean between these extremes, while attempting to be more specific than "free." It stays close to the notation of the sources, not because the notation is necessarily prescriptive, but simply because it is the closest we have to "hard" evidence. Should we think of the notation as presenting merely suggestive materials, to be recreated by the performer? That is largely a matter of opinion. In all the repertoires to be considered here—including Aquitanian polyphony and the *Liber Sancti Jacobi*⁵—I sense from the music as notated enough stylistic flair to make me have faith in some intention on the part of a composer. I can only regret the lack of a face-to-face encounter with the composer that would have communicated that intention to me, and I am left to consider the possibilities. There will be some situations (which we can attempt to specify) that allow alternative and optional realizations. Is this not the usual state of affairs?

While exploring possibilities presented by the notation and other aspects of the music, the present approach also explores the application of the isosyllabic hypothesis. It has long been observed that the basis of medieval verse is its syllabic structure, that is, the number of syllables in the line and the number of lines in the stanza (or other unit). Rhyme becomes a frequent and important adjunct to syllable count. Word accent, too, is an adjunct, in the sense that it is not basic to the structure of the verse; word accent is arranged in very regular patterns in certain repertoires, such as

⁴ Carl Parrish, *The Notation of Medieval Music* (New York: Norton, 1957; 2nd ed. 1959, repr., New York: Pendragon Press, 1978), 60–72. Richard Hoppin, *Medieval Music* (New York: Norton, 1978), 201–3.

⁵ The following sources will be cited below: London, British Library, Additional 36,881 (D); Florence, Biblioteca Mediceo-Laurenziana, Plut. 29.1 (F); Paris, Bibliothèque nationale, fonds latin 1139 (A); Paris, Bibliothèque nationale, fonds latin 3549 (B); Paris, Bibliothèque nationale, fonds latin 3719 (C); Santiago de Compostela, Biblioteca de la Catedral [no shelf mark], "Codex Calixtinus" (the relevant portion is referred to in this article as *Liber Sancti Jacobi*); Wolfenbüttel, Herzog-August-Bibliothek, Helmstedt 628 (Heinemann catalog 677) (W₁).

the Parisian sequence,⁶ but generally is much less regular and seems superimposed on an underlying syllabic structure. In his book *Words and Music in the Middle Ages*,⁷ Stevens affirms that syllable count is the basis for musical structure in the setting of medieval verse; he explores the use of this structure across a wide spectrum of medieval song, finding it especially and essentially characteristic of *le grand chant*, the high art of the troubadours and trouvères. Stevens then resubmits the isosyllabic hypothesis, to the effect that the most appropriate way of rendering the syllabic structure is by giving each syllable more or less the same musical duration. In the *grand chant* most syllables have one, two, or three notes; Stevens allows for a stretching of the syllabic unit for syllables with four or more notes. In other genres of song, vernacular and Latin, he explores modifications of isosyllabism. Approximate, not exact, equality is what is involved here; the approximate equality has the function of showing more clearly the relative length of successive verses, not of adding up in a rigid metric framework. The fact of syllabic structure in medieval monophony, together with the hypothesis of isosyllabic rendition, seems a likely point of departure for understanding rhythm in early polyphony. After considering the applicability of isosyllabic rendition to the Aquitanian repertoire and the *Liber Sancti Jacobi*, I will assess its continuing applicability to the incipient stages of Leonin's polyphony in the *Magnus liber*.

The proper precondition for a study of early polyphony would be a comprehensive, detailed history of "medieval chant," Latin sacred monophony that came into existence during the ninth to thirteenth centuries in the north, including the new forms and styles developed in that period.⁸ We are far from having such a history; in some respects we have barely begun. Still, there is enough of an outline to encourage us to start filling in some features of early polyphony against the background of the chant from which it sprang; we can work our way forward in time from chant through early polyphony up to the school of Notre Dame of Paris and the work of Leonin. We can think of polyphony within the context of chant; in doing so, it is important to keep in mind the different kinds of chant, even more important the diachronic development of these different kinds. For present purposes it will be sufficient to distinguish between

⁶ Margot E. Fassler, "Accent, Meter, and Rhythm in Medieval Treatises 'De rithmis,'" *Journal of Musicology* 5 (1987): 164–90.

⁷ See note 3.

⁸ Ewald Jammers, *Der mittelalterliche Choral: Art und Herkunft*, Neue Studien zur Musikwissenschaft, vol. 2 (Mainz: B. Schotts Söhne, 1954), first proposed the term and the concept. In my book, *A History of Musical Style*, 25–54, I attempted to sketch some of the outline.

Frankish-Roman ("Gregorian") chant of the "archetype,"⁹ new Frankish chant of the ninth and tenth centuries, and medieval chant of the period after 1000, in which syllable-counted verse is especially prominent.

In his work of the last thirty years, Dom Eugène Cardine has opened up fruitful ways of thinking about rhythm in the chant of the archetype.¹⁰ To make an extremely rough summary of Dom Cardine's extensive, detailed discussion, the single rhythmic value of Dom André Mocquereau's earlier system has been replaced by a more varied, and variable, set of values. To be sure, Dom Mocquereau always provided for three distinct values—besides the basic one, a slightly longer, variable value represented in the Solesmes publications by the episema, and a precisely measured value twice as long as the basic one, represented by a dotted note.¹¹ Nonetheless, the unit pulse flowed easily through these, and can be grouped in the persuasive twos and threes that were Dom Mocquereau's distinctive contribution to our ideas about chant rhythm. Dom Cardine also identifies three rhythmic values, but his are nominal, and there is no measured relationship between any two of them. He identifies a median syllabic value, a shorter, lighter one used especially in groups of notes over a syllable, and a lengthened value used variously in different contexts. These three nominal values seem to permit in practice a wide variety of durations, and that in turn seems suggested by the notation in the earliest sources, taking into account especially the letter indications. Dom Cardine's rhythmic values are grouped not by an inner momentum of the succession of twos and threes (as in Dom Mocquereau's system) but by a careful account of the disposition over the syllables and by close attention to certain features of the earliest notation.

The point that concerns us here is that the syllable emerges as a more prominent unit. Indeed, in some passages of Introits and Communions, where syllables with one note have their median value and some groups of two or three notes are lighter and faster, the result is not unlike the isosyllabic flow imagined by Stevens for the *grand chant* of troubadours and trouvères. (The obvious difference is that the syllables of Introit and Communion are in prose, those of *grand chant* in verse, and so it might seem that there was no point in keeping track of the syllable count—the

phrase length—of the prose chant. I believe that there is a point in so doing, but that is another matter.)

The Latin sacred monophony after 1000, while often using syllable count in verse, occasionally uses more notes per syllable than the *grand chant*; as a result, an isosyllabic rendition is less practicable. If four notes over a syllable require a little stretching of the syllabic beat, five to ten notes require much stretching, and more than ten notes suspends the rhythmic effect of the syllabic structure—at least temporarily. While not usual for medieval chant, such groups appear occasionally in certain repertoires; but they do not duplicate the peculiar quality of the melismata of the Gregorian Graduals, nor the seemingly irrational disposition of those melismata in the whole chant with its prose text. Somehow in medieval chant the syllable remains the unit of a rational plan even when overlaid with the relatively heavy decoration of more than four notes per syllable.

The repertory of Aquitanian polyphony, from the eleventh and twelfth centuries, is far better known than it was twenty years ago, and certain aspects are now well understood, at least by specialists.¹² First, the repertory does not duplicate or continue the Gregorian repertory of the archetype, or even "grow out of it" in any specific way. The texts are syllable-counted verse. Their only connection to the liturgy of the Mass is through the sequence, itself an addition to the Mass made by the Carolingians; the only functional connection with the Office is through the

⁹ For a recent discussion of the "archetype," see Kenneth Levy, "Charlemagne's Archetype of Gregorian Chant," *Journal of the American Musicological Society* 40 (1987): 1–30.

¹⁰ Dom Eugène Cardine, "Sémiologie grégorienne," *Études grégoriennes* 11 (1970): 1–158; trans. R. Fowels, *Gregorian Semiology* (Solesmes: Abbaye Saint-Pierre de Solesmes, 1982).

¹¹ André Mocquereau, *Le nombre musical grégorien, ou rythmique grégorienne, théorie et pratique*, 2 vols. (Rome, Paris, and Tournai: Société de Saint Jean l'Évangéliste, Desclée, 1908–27).

¹² A basic study is Sarah Fuller, "Aquitanian Polyphony of the Eleventh and Twelfth Centuries" (Ph.D. diss., University of California, Berkeley, 1969), 3 vols., with complete transcriptions in vol. 3. For another wide-ranging discussion, see Jens Bonderup, *The Saint Martial Polyphony: Texture and Tonality, A Contribution to Research in the Development of Polyphonic Style in the Middle Ages* (Copenhagen: Dan Fog Musikforlag, 1982). See also Leo Treitler, "The Polyphony of St. Martial," *Journal of the American Musicological Society* 17 (1964): 29–42; James N. Grier, "Transmission in the Aquitanian Versaria of the Eleventh and Twelfth Centuries," (Ph.D. diss., University of Toronto, 1985); Marianne Danckwardt, "Zur Notierung, klangliche Anlage und Rhythmisierung der Mehrstimmigkeit in den Saint-Martial-Handschriften," *Kirchenmusikalisches Jahrbuch* 68 (1984): 31–84. Facsimiles in Parrish, *Notation*, plates 21–23; Bruno Stäblein, "Saint Martial," *Die Musik in Geschichte und Gegenwart* 11 (1963): 1265–70; Bryan Gillingham, ed., *Paris Bibliothèque nationale, fonds latin 1139*, Publications of Mediaeval Musical Manuscripts, no. 14 (Ottawa: Institute of Mediaeval Music, 1987); *Paris Bibliothèque nationale, fonds latin 3719*, Publications of Mediaeval Musical Manuscripts, no. 15 (Ottawa: Institute of Mediaeval Music, 1987); *Paris Bibliothèque nationale, fonds latin 3549 and London, B.L., Add. 36,881*, Publications of Mediaeval Musical Manuscripts, no. 16 (Ottawa: Institute of Mediaeval Music, 1987). Examples in Richard H. Hoppin, ed., *Anthology of Medieval Music* (New York: Norton, 1978), 42–49.

"Benedicamus versus." In cases where the lower voice¹³ resembles the style of preexisting chant, it resembles medieval chant—specifically the Aquitanian monophonic versus¹⁴—not the Gregorian. No Gregorian chant is used as a cantus firmus in Aquitanian polyphony (in the Compostelan Office of St. James the situation is different and will be discussed later).

Second, while the upper voices of Aquitanian polyphony often have five to ten notes per syllable, and occasionally more, the style of the repertory as a whole is not similar to that of the later Notre Dame school (the organum purum of Leonin's *Magnus liber*), either in the extent or the melodic inflection of the melismata. Furthermore, the repertory as a whole cannot meaningfully be divided into pieces that are melismatic and those that are not; and especially it cannot be divided into the Notre Dame categories of "melismatic organum" and "discant." Instead the seventy or so pieces fall along a continuum in a way that makes classification by such means impractical. If there is a dominant relationship between the voices, it can best be termed "florid discant,"¹⁵ a relationship that can, however, include single notes on syllables at any point.

When speaking of early polyphony, the terms "melisma" and "melismatic" need to be restricted to their original chant meaning of "many notes for one syllable." When the two voices move at different speeds the different kinds of movement are best described separately and by other terminology. The basic difference seems to be whether, at any given moment, only one voice moves to a new pitch (the other voice holding its same pitch), or both voices move to new pitches. An uninterrupted succession of the first kind of event will produce what is best (and usually) described as "held-note style," most familiar in Notre Dame organum purum. An uninterrupted succession of the second kind of event will produce "discant" in its strictest sense. These styles are characteristic of the Notre Dame repertory, but not of the Aquitanian repertory, in which the two kinds of events can succeed each other in a wide variety of configurations and of relationships with the underlying succession of syllables.

¹³ For early polyphony before that of the school of Notre Dame, I will refer to the two voices as "upper" and "lower," meaning thereby their position on the page in score arrangement: "lower voice" is immediately above the text, "upper voice" is notated above the lower.

¹⁴ For the Aquitanian monophony, see Leo Treitler, *The Aquitanian Repertories of Sacred Monody in the Eleventh and Twelfth Centuries*, 3 vols. (Ph.D. diss., Princeton, 1967); Ståblein, "Saint Martial"; and Sarah Fuller, "St. Martial," *New Grove Dictionary of Music and Musicians* (1980) 16:398–99.

¹⁵ Fuller, "Aquitanian Polyphony," 1:7. See also idem, "The Myth of 'Saint Martial' Polyphony: A Study of the Sources," *Musica disciplina* 33 (1979): 5–26.

The starting point, then, for understanding the rhythmic structure of Aquitanian polyphony is its syllabic structure: Aquitanian polyphony is a "syllabic artefact" (Stevens's term) like the medieval chant from which it sprang. As Treitler put it, "its fundamental pulse is the pulse of declaimed syllables of text, graphically represented by the sequence of ligatures, whether these are given identical duration or the proportional durations of the modal rhythms."¹⁶ But while most agree that the verse structure generates the large-scale form of these polyphonic pieces, there is less agreement about how far down to detail this is true. Do the pervasive accentual patterns (often on every other or every third syllable) generate form? I think not, and find the syllable in itself to be the unit of the verse.

Most Aquitanian polyphony is notated in a score arrangement (as is also the polyphony in the *Liber Sancti Jacobi*), and as Willi Apel emphasized long ago, this is an important feature. But the score notation is only a symptom of a more basic condition of early polyphony, namely that the two voices sing the same syllables at the same time. It is this condition that makes possible the notation in parts, as in the Winchester Tropers. And in the Aquitanian "successive notation,"¹⁷ in which two parts to be sung together are notated one after the other over two consecutive verses of text, the combining of the parts is made possible not by the syllables themselves but by the *number* of syllables—the basic element in the construction of the verse. It seems to me that the alignment by syllables is the least uncertain factor in early polyphony, and the one upon which we should most rely.

In general, chant notation presents relatively few difficulties in aligning notes with syllables, difficulties that students of later polyphony treat under the heading "text underlay." We have to remember that the process in chant is better thought of as "melody overlay." Polyphonic score notation, however, presents abundant problems in aligning the notes—especially those in the upper voice—with the syllables. This is because, while the scribe was skilled at notating chant over syllables precisely, he had no experience in notating a second melody at a considerable distance above the words, often with a number of notes per syllable different from the first melody. The result is imprecise alignment.

The most obvious symptom of this imprecision is the addition of marks of alignment to the notation. In the earlier sources, and sometimes in the later ones, these marks seem to have been entered after the original

¹⁶ Leo Treitler, "A Reply to Theodore Karp," *Acta musicologica* 40 (1968): 227–29.

¹⁷ Fuller, "Aquitanian Polyphony," 1:111–48; Sarah Fuller, "Hidden Polyphony—A Re-appraisal," *Journal of the American Musicological Society* 24 (1971): 169–92.

notation; they represent, in other words, an attempt (and often a messy one) to show the alignment of the parts more exactly than it was indicated by the scribe. It seems probable that we should not take these marks of alignment for anything more than that: they have no rhythmic significance.¹⁸ Sometimes they occur in such a way as to suggest a rhythmic unit, or a phrase, but that seems to be merely because such places are convenient; marks of alignment can occur in other places, too.

Because they show how someone close to the scene thought the parts should be aligned, these marks are invaluable, and we must observe them. They should not, however, blind us to a more basic, more indigenous technique of notating the alignment. All except strictly syllabic passages are notated using ligatures,¹⁹ which by their nature are associated with syllables in certain ways. The singer of early polyphony was a chant singer by training and, presumably, would have observed the ligatures without even thinking about it. When singing the upper voice, the singer would have begun a syllable only at the beginning of a ligature, even if not notated exactly above the syllable.²⁰

Ignoring for a moment the use of ligatures in notation, we need to consider abstractly the possible relationships between the two parts in terms of the number of notes.²¹ In the Aquitanian repertory the possible relationships are spread out over a broad continuum. Since the organum-discant dichotomy will not do, a more specific and detailed set of descriptions seems required. The following classification, based upon a single syllable, will facilitate the application of the isosyllabic hypothesis of rendition:

1. One note in the lower voice against
 - (a) one note in the upper voice (hence strictly note-against-note).
 - (b) two or three notes in the upper voice.
 - (c) four notes in the upper voice.
 - (d) five to ten notes in the upper voice.
 - (e) more than ten notes in the upper voice.

¹⁸ Fuller, "Aquitanian Polyphony," 1:331 n. 33.

¹⁹ Given the difficulties that emerge from Dom Cardine's discussion of *neume* (Cardine, *Gregorian Semiology*, trans. Fowels, 16, 78), I am referring throughout to note-groups as "ligatures," meaning thereby a group of pitches whose written presentation indicates they are to be sung to one syllable rather than divided among two.

²⁰ This has been generally, but not universally, acknowledged; see, for instance, Willi Apel, *The Notation of Polyphonic Music*, The Medieval Academy of America, Publication no. 38 (Cambridge, 1942; 5th ed., 1961), 214. It is reaffirmed definitively by Danckwardt, "Zur Notierung," 32.

²¹ There is a comparable but more elaborate scheme in Bonderup, *Saint Martial Polyphony*, 43–50.

2. Two notes in the lower voice against
 - (a) one note in the upper voice.
 - (b) two or three notes in the upper voice.
 - (c) four notes in the upper voice.
 - (d) five to ten notes in the upper voice.
 - (e) more than ten notes in the upper voice.
3. Three notes in the lower voice (the categories can be similarly continued).

With more than four notes per syllable in either voice, a situation develops in which the syllabic structure becomes less effective—much the same as in monophony. This happens in several different ways, which will require comment later. Yet, though particularly frequent in certain pieces, the melismata are usually mixed with syllabic passages; conversely, few pieces are strictly note-against-note. Nearly all pieces show more than one kind of relationship between the voices.

In case 1a the two voices sing the same words at the same time, one note per syllable; the rhythmic problem is no more nor less than it is in monophony—that is, in monophonic Aquitanian syllable-counted verse. Under the isosyllabic hypothesis the syllables would flow by easily in an equal median beat. Phrase rhythms would be guided by syllable count and melodic inflection.

Case 1b brings two or three notes against each note and syllable in the lower voice. The groups of two or three notes will be written in ligatures, whose use exemplifies the close relationship that can exist between ligatures and syllables. The two or three notes can be rendered, under the syllabic hypothesis, as subdivisions of the basic syllabic unit. If the syllable has a median rhythmic value, the two or three notes in the upper voice slip by with no particular problem about their relative durations. This subdivisibility is one of the most important aspects of the kind of rhythmic motion to be assumed for monophony as well as for polyphony of the eleventh and twelfth centuries.²²

Case 1c, with four notes in the upper voice, presents a problem and leads to another important aspect. As Stevens imagines for song, so I imagine a slight stretching of the syllabic beat to accommodate the four notes. The singer—or singers—of monophony may scarcely notice the stretching of the syllabic value, nor will the singer of the upper voice in polyphony; but the singer of the lower voice will notice it, and must

²² This as well as other ideas (that I find congenial) on the subject were expressed briefly and speculatively by Jacques Handschin, "Die mittelalterlichen Aufführungen in Zürich, Bern und Basel," *Zeitschrift für Musikwissenschaft* 10 (1927): 8–22.

accommodate it. The problem of how the lower voice is to know when to move on to the next syllable has perhaps been an obstacle to this rhythmic interpretation; modern observers have felt that the problem can be solved only by exactly measured values in both voices. But I think the problem may be solved in a way that is familiar to modern performers. In recitative, the accompanist regularly accommodates the rhythmic flow of sustained chords to the singer's diction, performing a "stretch-and-wait" until the singer comes to a syntactic close. (And, of course, such accommodation is standard practice in all kinds of ensemble performance.)

In the polyphonic case we are considering, the stretch-and-wait takes place within one syllable. We can apply the same procedure, in progressively extreme form, to cases 1d and 1e (see example 1, *Sub carnis tegmine*). Once the lower voice has learned to expect the stretching, he can sustain it for shorter or longer as required. We should remember that there has been prior experience, in more basic form, in chant singing: in a syllable-counted chant that has terminal melismata, the singers go through a similar suspension of the syllabic beat, using a similar ensemble accommodation to reach the close together. The syllable itself, of course, is an easily perceptible framework for the accommodation, providing a number of subtle phonetic clues with which the singers can communicate to each other their timing.

Example 1. From *Per partum virginis* (F-Pn lat. 3549, fols. 150v-151r).

Sub carnis tegmine

homo pro homine solvitur la-

tu- it

* Emend to read *D B C A / B A G*?

Cases 1c, 1d, and 1e, with four or more notes over a syllable, bring up an important feature of the notation. The basic ligatures represent two notes or three notes but may be combined with each other, and with single notes, to make complex forms of four, five, or six notes. Aquitanian scribes sometimes write seven or eight or more, typically in descending scales leading to cadences. But in general a melisma will be notated in a string of ligatures each two, three, or four notes long; we can usually see the separation with ease (assuming familiarity with the style of chant notation the scribe is using), and we can assume that the singer perceived it automatically.

Case 1 altogether, with only one note in the lower voice for a syllable, really presents no great problem of notation, rendition, or rhythmic understanding: the syllables can go along more or less equally until the upper voice has four or more notes; then the lower voice holds while the upper voice sings its melodic decoration. Case 2, with two notes in the lower voice over a syllable, raises another kind of problem. While cases 2a and 2b are for practical purposes equivalent to case 1b, from case 2c on the problem becomes severe.²³ When the lower voice has two notes per syllable, and when these two are written in ligature, there is no clear way of knowing from the notation how to align the second note with the several notes in the upper voice. We know that this was a problem for twelfth-century singers, too, since by the time of Notre Dame notation a drastic step had been taken to solve it. But as long as ligatures persisted in the lower voice, there was no single solution. All we can do is identify the logical possibilities, and assume that these were options for singers then.

First possibility: the second note in the lower voice is sung *ad libitum*, whenever the singer wishes.

Second possibility: the second note in the lower voice goes immediately with the second note in the upper voice.

Third possibility: the second note in the lower voice goes with the start of the next (or some subsequent) ligature.

Fourth possibility: the second note in the lower voice goes with the last note in the upper voice; or, by analogy with the third possibility, with the last note of some ligature preceding the last one in the upper voice.

²³ Expressed by Apel, *Notation*, 214 (and others since). Apel emphatically designated as the preferred solution the third of the possibilities that I identify below.

With the first possibility, I am suggesting not just a lack of knowledge on our part, but rather that the composer did not intend one specific alignment. I think we have to acknowledge that in at least some instances the position of the second note could have been indeterminate. Furthermore, we should think of this as a free choice not merely to align with this or that note in the upper part, but instead, to sing the note anywhere between this point and that point. (Returning to our modern analogy, the result would be like two continuo players arpeggiating a chord freely within the same time span.) But this indeterminacy extends only within the syllable: the lower voice would start its first note with the upper voice, begin the second note at an indeterminate time, and end the syllable with the upper voice. Example 2 shows passages on "(cor-)ru-(it)" and "(femi-)ne-(a)" which seem apt for this possibility.

Example 2. From *Primus homo corrui* (F-Pn lat. 3549, fol. 152).

O pri-mus ho-

mo cor-ru-it in frau-

de fe-mi-ne-a /

The first possibility—indeterminacy within the syllable—can be imagined as the starting point for a series of choices made by singers over a period of decades, resulting in more specific location of the notes in the lower voice relative to the upper. Such a process might result in the increased “verticality” envisaged by Treitler.²⁴ No direct progression, however, can lead to the Notre Dame style, with its bifurcation of organum

and discant. Still, one might argue that even within the extended melismata of Leonin’s organum there is more specific location of tenor notes than in Aquitanian florid discant.

In any case, my second, third, and fourth possibilities offer the specific locations immediately available. They would have been selected by the singer primarily according to the degree to which he wanted clear arrivals on consonances; yet the possibilities seem limited by the ligature arrangement.

The second possibility, if it involves cases 2d or 2e, seems at first glance unlikely: it seems irrational that the two notes in the lower voice are not to be spaced out more or less evenly under the upper voice. Nonetheless, there are a few cases where it seems called for, in particular where the two (or three or four) notes in the lower voice seem intended to move in descending parallel fourths or fifths with the first notes in the upper voice (as in the beginning of example 2). When the singer of the lower voice reached its last note, he would hold it until the end of the syllable.

The third possibility is the most obvious of the four—and the one most favored in modern transcriptions.²⁵ Here the two voices move as they would for a change in syllable. With several ligatures in the upper voice, as in cases 2d and 2e, there may be more than one option in a given instance.

The fourth possibility, on the other hand, is not so obvious; in fact, it may seem unlikely. Yet it is a possibility and, what is more, seems to be an increasingly preferred option.²⁶ Besides the first note of a ligature, the last note is the only other identifiable point of coincidence, middle notes of a ligature not being practicable. Matching the last note in the lower voice with the end of a ligature in the upper is analogous with closing on the end of a syllable. We saw how the lower voice could stretch and wait for the end of the syllable, then move to the next together with the upper voice. In the case of two notes, the lower voice can again stretch and wait (on its first note), then match its second note to the end of the syllable before moving on to the new syllable with a new note. Example 3 shows the application of this possibility on the syllables “(Sene-)scen-te,” “(fili-)o,” “quem,” and “(fove-)bat.” Matching the second note to the end of an upper-voice ligature *within* the syllable is more delicate, requiring greater

²⁵ See note 23.

²⁶ Apel, discussing the *Liber Sancti Jacobi* in *Notation* (p. 214), pointed out, as others have since, that the consonances are often better using this possibility. But Apel rejected it on the same grounds mentioned for the second possibility, i.e., that the notes should be more evenly distributed under the melisma.

²⁴ Treitler, “Polyphony of St. Martial,” 39–41.

prearrangement and sensitivity on the part of the singers, but it could be assumed to have become more frequent as polyphonic technique developed.²⁷

Example 3. From *Senescente mundano filio* (F-Pn lat. 3549, fol. 153).

Se - ne scen - te mun - da - no

fi - li - o / quem fo - ve - bat

men - tis ob - li - vi -

(etc.)

o /

These four possibilities constitute solutions to what I call "the two-note problem," in which there are two notes in the lower voice per syllable

²⁷ The fourth possibility would be greatly facilitated by a tendency for "neume-groups" in chant to close on a slightly prolonged note. Guido writes of a *mora ultimae vocis* in chapter 15 of *Micrologus* (J. Smits van Waesberghe, ed., *Guido Aretinus: Micrologus*, *Corpus scriptorum de musica*, no. 4 [n.p.: American Institute of Musicology, 1955], 163; *Hucbald, Guido, and John on Music*, trans. Warren Babb and ed., with introductions, by Claude V. Palisca, *Music Theory Translation Series*, no. 3 [New Haven: Yale University Press, 1978], 70). Dom Cardine's implementation of the "neumatic break" suggests this operating as a principle (Cardine, *Gregorian Semiology*, trans. Fowels, 79–91). If this were the case at least sometimes, it would make the matching of last notes easier; if it were not the case, the fourth possibility would soon make it a habit in polyphony, as a little experimentation will show.

and a greater number of notes in the upper voice. (By extension, generalizations about the two-note problem are germane to similar problems involving three or more notes in the lower voice.) The two-note problem presents itself only occasionally in the Aquitanian repertory—not at all in some pieces, only once or twice in many. But, taken together with frequent instances of five or more notes in the upper against one in the lower (cases 1d and 1e), it suggests a shift in the roles of the two voices: the upper voice seems to be given the lead. As the number of notes per syllable increases in the upper voice, it is stretched to the point where the lower voice cannot be imagined to control the rhythm. This effect is especially noticeable in applying the four possibilities, where the lower voice accommodates itself to the upper. At this point one may ask how the upper voice is guided rhythmically through its melismata, where the syllabic structure is no longer operative.

A possible answer to this question is offered by a particular melismatic structure that has been frequently noticed and discussed.²⁸ These melismata often proceed in a uniform succession of two-note or three-note ligatures in the upper voice against matching ligatures in the lower; less regular arrangements, in which the ligatures have unequal numbers of notes, also occur. This structure suggests another hypothesis, to complement the isosyllabic one: in such note-against-note melismata each pair of matching ligatures in the upper and lower voices can be taken as the rhythmic equivalent of a syllabic unit.²⁹ If the matching pair contains two-note or three-note ligatures, the unit can be considered as similar to case 1b; if four notes, to case 1c. Since the actual ligatures do not often exceed four notes, matching ligatures in the five-to-ten class are exceptional; but they do occur³⁰ and would require a stretch in both voices simultaneously.

²⁸ For instance, see Treitler, "Polyphony of St. Martial," 37–38. Such melismata are, from a syllabic point of view, a remarkable phenomenon within this style; in order to include them in the scheme of classification suggested earlier, the scheme would have to be expanded to unusable proportions. It is striking that this kind of melisma was developed before the very different extensions in Leonin's *Magnus liber*; but cf. the clausula *Tamquam* (the end is in example 5), which seems to be the only survival in the *Magnus liber* of this kind of melisma. Bruno Stäblein used these melismata as basic material ("Modale Rhythmen in Saint-Martial-Repertoire," *Festschrift Friedrich Blume zum 70. Geburtstag*, ed. Anna Amalie Abert and Wilhelm Pfannkuch [Kassel: Bärenreiter, 1963], 340–62); but see the thorough critique in Fuller, "Aquitanian Polyphony," 1:315–20.

²⁹ Expressed briefly by Hoppin, *Medieval Music*, 203.

³⁰ See "Zacheus" in *Veri solis radius* from F-Pn lat. 3549, fol. 150. Facsimile edition: Bryan Gillingham, ed., *Paris Bibliothèque nationale, fonds latin 3549 and London, B.L., Add. 36,881*, p. 5.

According to this second hypothesis, the range of rhythms and rhythmic values in the melismata would be continuous with those in the more syllabic passages. As a passage of case 1a or 1b is followed by a note-against-note melisma in two-note or three-note ligatures, the pace of the fastest notes would remain more or less the same. The notes in the melisma would move lightly and quickly, like the two or three notes over a single syllable, and the notes in the melisma could be grouped with a flexible pulse that would approximate the syllable in the syllabic passage. This interpretation seems supported by the way matching ligatures in a melisma often involve a kind of contrary motion that closes strongly on a unison at the end of each ligature, as in example 1. It seems appropriate for these strong closures to mark off units commensurate with the syllables.

This hypothesis, under which ligatures within a melisma are to be treated rhythmically like syllables, can be applied to less regular arrangements and also to melismata of cases 1d and 1e, which involve melismata in the upper voice against single notes in the lower. In such cases the proposed treatment of ligatures in the upper voice would provide the same kind of rhythmic continuity with the surrounding syllabic structure (see example 1, *Sub carnis tegmine*). This interpretation would not by itself, however, help with the cadential descending scales that are usually notated in a single ligature; under the hypothesis, these would involve a suspension of the syllabic beat (entirely appropriate, however, for a cadenza). There would be other cases, too, in which it would be difficult to read melismata in ligature groups.

The Aquitanian repertory of polyphony allows no consistent system of rhythm, and we should not expect to find one, let alone impose one arbitrarily. The repertory can be imagined to have been developed from, say, 1050 to 1200 and to represent the dynamic exploration of a whole series of new ways of combining two voices. We should imagine successive compositions trying out different, perhaps progressively more extended and elaborate, combinations of upper voice with lower voice and, with each new attempt, perhaps a different rhythmic manner of synchronizing the two voices in performance. The advantage of the isosyllabic hypothesis is, I believe, that it presents a larger rhythmic context in which the synchronization can take place, without any assumption of meter and without any need to specify the rhythmic detail inside groups of two, three, or four notes; these notes can be equal or unequal ad libitum. I imagine that the detailed rhythmic flow within the syllable in both voices could have been different in each rendition; what was composed was a melodic configuration of syllables against a background discant framework. And I imagine the syllabic "beat" itself (whether derived from actual syllables or from ligatures within melismata) to be as flexible as the large beat or

count that dancers, for instance, sometimes use to keep track of approximately equal durations.

In the absence of a documented system of synchronizing the two voices, scholars have often proposed consonance as the most reliable and desirable factor to use. Apel relied on it heavily and proposed its use also for the organum purum of the *Magnus liber*.³¹ There has been much discussion about the relative "verticality" as opposed to "horizontal" of early polyphony in general, and of Aquitanian polyphony in particular, with reference to the role of consonance.³² Karp,³³ and more recently Sanders,³⁴ felt that preservation of consonance between the two voices was justification for ignoring the ligatures or the syllabification. But, while consonance is certainly essential rather than accidental to the structure of "discant,"³⁵ in the case of florid discant the consonance structure is in the background; florid, almost by definition, involves covering up the background, often by the placement of dissonance. The notational data of Aquitanian polyphony would have to be radically interpreted to get around all the dissonance. In any case, do we really want to make it sound like, say, Viadana, when it might sound more like Monteverdi?³⁶

The dissonances that are objected to in Aquitanian polyphony are sometimes identified as being located "on the beat."³⁷ But, since there seems to be no possibility of applying a metrical system—let alone a modal one³⁸—there is no beat in a metrical sense, and the dissonances cannot be considered to be "on the beat." We can only say that over a new note in the lower voice there may be a dissonance instead of a consonance. The kind of beat I imply by "syllabic beat" is more in the nature of an arrival at the end of a syllable, and, without making a rule,

³¹ Willi Apel, "From St. Martial to Notre Dame," *Journal of the American Musicological Society* 2 (1949): 145–58.

³² Wulf Arlt, "Peripherie und Zentrum: Vier Studien zur ein- und mehrstimmigen Musik des hohen Mittelalters, Erste Folge," *Basler Studien zur Musikgeschichte I*, ed. Wulf Arlt and Hans Oesch, Basler Beiträge zur Musikgeschichte, Forum Musicologicum, 1 (Berne: Francke Verlag, 1975), 169–222.

³³ Theodore Karp, "St. Martial and Santiago de Compostela: An Analytical Speculation," *Acta musicologica* 39 (1967): 144–60.

³⁴ Ernest Sanders, "*Sine Littera* and *Cum Littera* in Medieval Polyphony," *Music and Civilization: Essays in Honor of Paul Henry Lang*, ed. Edmond Strainchamps and Maria Rika Maniates (New York: Norton, 1984), 215–31.

³⁵ Richard L. Crocker, "Discant, Counterpoint, and Harmony," *Journal of the American Musicological Society* 15 (1962): 1–21.

³⁶ Well expressed by Hoppin, *Medieval Music*, 204–5.

³⁷ Karp, "St. Martial and Santiago de Compostela," 146–47.

³⁸ Ernest Sanders, "Duple Rhythm and Alternate Third Mode in the 13th Century," *Journal of the American Musicological Society* 15 (1962): 249–91, offered the case for dating the modal system from the substitute clausulae—after the *Magnus liber*.

this frequently seems to be consonant. Rather than arguing *a priori* (from general principles or from what the organum treatises may say) for a particular practice of consonance in florid discant, I prefer to assume the ligatures and syllabification mean what they appear to mean and to see what kind of consonance practice results.³⁹

The other major collection of twelfth-century polyphony before (or alongside) Leonin is the *Liber Sancti Jacobi*, which contains the Office of St. James presumably made for Compostela; it contains about twenty polyphonic works.⁴⁰ This repertory is different in certain important respects from the Aquitanian one and is similar to Leonin's *Magnus liber* in those same respects. It has been tempting to transcribe it in modal rhythm, using the procedures later applied to the Notre Dame school, but the results have not been generally accepted. Here I want to treat the notation according to the considerations developed for Aquitanian polyphony, with a view towards discovering how much and in what ways the *Magnus liber* can be similarly understood.

The *Liber Sancti Jacobi* contains two types of polyphony. There are eight polyphonic versus in rhyming, syllable-counted verse. The lower voices have usually one or two notes per syllable, the upper voices usually one, two, or three notes, occasionally four or five. As exceptions there are terminal note-against-note melismata of up to twenty notes, as in Aquitanian polyphony. Examples are on "ista" in *Congaudeant* (fol. 185r) and on "domino" in *Gratulantes* (fol. 185v). In *Ad superni* there is one at the end of each stanza (fol. 185v). There are other occasional melismata in the upper voice only, of up to twelve notes; usually there is only one of these to a work. In all these works the syllabic structure is very prominent; the rhythms are easily rendered in the moderate, flexible syllabic beat

³⁹ Treitler, "Polyphony of St. Martial," 39 n. 23, expressed a similar caution.

⁴⁰ Peter Wagner, ed., *Die Gesänge der Jakobusliturgie zu Santiago de Compostela aus dem sog. Codex Calixtinus* (Freiburg im Schweiz: Universitäts-Buchhandlung [Gebr. Hess & Co.], 1931); Dom German Prado, O.B.S., *Liber Sancti Jacobi Codex Calixtinus*, vol. 2, *Musica* (*Reproduccion en Fototipia seguida de la Transcripcion*) (Santiago de Compostela, 1944); José López Calo, S.J., *La musica medieval en Galicia* (La Coruña: Fundacion "Pedro Barrie de la Maza, Conde de Fenosa," 1982), 46–51 (color facsimiles). See also Higinio Anglés, "Die Mehrstimmigkeit des Calixtinus von Compostela und seine Rhythmik," *Festschrift Heinrich Besseler zum sechzigsten Geburtstag* (Leipzig: Deutscher Verlag für Musik, 1961), 91–100; Wolfgang Osthoff, "Die Conductus des Codex Calixtinus," *Festschrift Bruno Stäblein zum 70. Geburtstag*, ed. M. Ruhnke (Kassel: Bärenreiter-Verlag, 1967), 178–86; Treitler, "Polyphony of St. Martial"; Karp, "St. Martial and Santiago de Compostela"; Hoppin, *Medieval Music*, 207–14. The favorite topic of discussion and transcription is *Kyrie cunctipotens genitor*; see Hans Heinrich Eggebrecht and Frieder Zaminer, *Ad organum faciendum: Lehrschriften der Mehrstimmigkeit in nachguidonischer Zeit*, Neue Studien zur Musikwissenschaft, 3 (Mainz: B. Schott's Söhne, 1970), 104, especially n. 21.

previously described—even in *Regi perhenni* (fol. 187r) and *Vox nostra* (fol. 187v), which have the most elaborate upper voices. And the melismata can be treated under the second hypothesis, with matching ligatures in the two voices treated as syllabic units.

The second type of polyphony contains the novelties that resemble features of the *Magnus liber*. There are four Matins responsories, one Gradual responsory, an Alleluia for Mass, three settings of the words "Benedicamus domino," and the *Cunctipotens genitor*, a Kyrie versus that is grouped here because of its style (the other Kyrie versus, *Rex immense*, was counted in the first type). The novelties, relative to the Aquitanian repertory, concern chiefly the responsories, which are in traditional responsory format and, compared to medieval versus, resemble chant of the Gregorian archetype. While the words are in prose, however, they are newly assembled for the purpose of this Office, and the melodies are apparently Frankish of the tenth century or later (if not of the twelfth). The verse melodies are not those of the traditional set of eight used for responsory verses. Since, in the respond, only the cantor's intonation is set in polyphony, the polyphonic verse constitutes most of the work. These qualifications notwithstanding, the four Matins responsories as well as the Gradual responsory and the Alleluia present a new format for twelfth-century polyphony. (One responsory, *O adjutor*, has a prosa, *Portum in ultimo*, which is in versus-style and is strongly contrasted against the polyphony of the rest of the verse.)

The responsory format includes occasional long melismata in the lower voice. Examples are *Huic Jaco—bo* (fol. 188r); *O—adjutor* (fol. 188r); *Misit herodes V. Occidit autem—* (fol. 189r); *Alleluia V. Vocavit* (fols. 189v–190r). The final example contains several, but the last is note-against-note, as in versus. Two of the three settings of "Benedicamus domino" also contain long melismata (fol. 190r–v). These melismata, along with more frequent shorter ones, are set with usually three or four notes in the upper voice to each note of the lower, producing long non-syllabic passages, and these present the main rhythmic problem of the repertory.

Throughout the responsories there is a great increase in the frequency of the two-note problem, as the verse-tones of the responsories often have two-note ligatures over a syllable. Remarkably, these lower-voice melismata are sometimes notated using single notes in a long series instead of ligatures, contradicting the whole tradition of notating chant melismata. Examples can be found in *Huic Jaco—bo*; *Jacobe V. Tu con—* (*o—ra* has ligatures); *O adjutor* (a mixture of single notes with ligatures) *V. Qui sub—*; *Misit V. Occidit autem—* (mixture), *Johan—* (mixture); *Alleluia V. Vocavit: Johanem, nomina, Boa—nerges, Benedicamus domino* (a light mixture in two of the three). A possible explanation would be that the single notes

permit clear alignment on the page, avoiding the two-note (or three-note) problem completely. But this fails to explain why one finds ligatures mixed with single notes in the lower voice, and it relies too greatly on the vertical alignment of notes, which—even in this source—is not always clear. On the other hand, the four possibilities are easy to apply, and the fourth possibility seems to result in an arrival on a consonance even more frequently than in the Aquitanian repertory. Examples can be seen in example 4, from *Dum esset* (fol. 187v). The transcription uses slurs in the lower voice to show possible alignment. The slur after the first note of a unit shows its maximum length, which will depend on when the second note starts. I have placed the second and following notes as late as they could come, with slurs preceding them to show how early they could come; the overlap between the slur following a note and the slur preceding the next note shows the zone in which the change from the first note to the second could occur. The use of ligatures or single notes in the manuscript is shown over the lower voice.

Solutions such as these have been several times suggested, from Handschin to Hoppin, always as purely practical ones, in the absence of documentation. That they are practical is, of course, their strength. And, though they still lack documentary support, I think they can now be placed in the larger context outlined here, involving on one hand the syllabic structure of monophony and the isosyllabic hypothesis, and on the other the use of ligatures.

One reason it is hard to approach Notre Dame rhythm and notation from premises such as those presented here is that the nexus of modal rhythm is so strongly integrated; it is not readily separated into its components. Nonetheless, I feel its components need to be understood separately and, perhaps, seen as separate historical phases. I see three components.

The first component is modal rhythm in a pure, theoretical state (as described by Waite in connection with Augustine's theory of rhythm⁴¹). In this state long and short values follow each other in strict alternation—or better, it is as if time itself consisted of alternating long and short slots. Each note in turn becomes long or short depending on the slot into which it falls, so the length of the note is known by its position in the series and need not be shown by its notation. This pure state is not so often apparent in the *Magnus liber*; but, although few have agreed with Waite that all the organum purum should be read as modal,⁴² several ob-

⁴¹ William Waite, *The Rhythm of Twelfth Century Polyphony: Its Theory and Practice*, Yale Studies in the History of Music, vol. 2 (New Haven: Yale University Press, 1954), 14, 38, 54.

⁴² Manfred Bukofzer's review of Waite, *Rhythm*, in *Music Library Association: Notes*, 2nd ser., 12 (1955): 232–36, in spite of stringent criticism of Waite, seemed to agree "in

Example 4. From *Rt. Dum esset* (*Liber Sancti Jacobi*, fol. 187v).

Magister ato eps trecensius

Rt. Dum es - set

Si - cut

e - nim vox

to - ni - tru - i (etc.)

principle." For a summary of treatments of organum purum, see Hans Heinrich Eggebrecht, "Organum purum," in *Musikalische Edition im Wandel des historischen Bewußtseins*, ed. Thrasybulos G. Georgiades, *Musikwissenschaftliche Arbeiten*, no. 23 (Kassel: Bärenreiter, 1971), 93–112; and more recently, Jeremy Yudkin, "The Rhythm of Organum Purum," *Journal of Musicology* 2 (1983): 355–76, an impressive philological-philosophical demonstration that the thirteenth-century theorists tell us only that organum purum was not modal. I, too, agree that Waite's thesis is untenable (and would not now transcribe *Viderunt* as I did in *A History of Music Style*, 74–75). Nonetheless, while "freer" methods continue to be discussed at length, no other complete transcription has been published, and Waite's—in spite of the need for minor improvements and alternatives in readings—remains the only ready place (besides the facsimile) in which to study the music of the *Magnus liber* in the *W₁* version.

servers have pointed to separate passages that use a pure succession of binary ligatures and imagine such passages to move in modal rhythm in contrast to the freer rhythm in surrounding passages.⁴³ We will need to remember that this pure modal rhythm comes in the duplum over a held tenor note, without the problem of rhythmic coincidence between the two voices. As a corollary, modal rhythm in this pure state can include the idea that a phrase (*ordo*) ends with the value with which it began—a long and a long.

The second component is the measurement of long and short values, with one long equal to two breves. This is not strictly a “modal” factor, but rather a “mensural” one—and this has not been pointed out, I think. It is immaterial to the pure modal alternation of long and short what their relative values are, as long as they are constant. But mensuration, measurement, is present in the modal system as soon as a long equals exactly two breves. We are accustomed to say that the notation does not become mensural until Franco’s time (and then only to a limited extent)—but such a distinction of modal from mensural pertains specifically to the notation, not to the rhythm as performed.

The third component concerns a rhythmic value that is hard to name in a premodal state—so much does it seem to us a product of modal rhythms. Yet I am convinced that this value is separate from and prior to pure modal rhythm or mensuration. We call it a “ternary long,” but we should remember that Johannes de Garlandia called it a *longa ultra mensuram*, “outside of measure,” meaning by “measure” the breve and the long. Later, Franco regarded it as the source of the modes.⁴⁴ But, while it was logical for Johannes de Garlandia (and his twentieth-century followers) to equate the ternary long with the sum of a measured long and a breve, it is possible that this “ultra-long” value had its origin in the syllabic beat of the versus and, hence, was available for use before either modal or mensural elements were applied.

⁴³ For instance, Fritz Reckow, “Das Organum,” *Gattungen der Musik in Einzeldarstellungen: Gedenkschrift Leo Schrade*, ed. Wulf Arlt et al. (Bern: Francke Verlag, 1973) 434–96; cf. Ernest Sanders, “Consonance and Rhythm in the Organum of the 12th and 13th Centuries,” *Journal of the American Musicological Society* 33 (1980): 264–86. See also Janet Knapp, in a forthcoming study on Notre Dame polyphony.

⁴⁴ For Garlandia, see Erich Reimer, ed., *Johannes de Garlandia: De mensurabili musica: Kritische Edition mit Kommentar und Interpretation der Notationslehre*, 2 vols., Beihefte zum Archiv für Musikwissenschaft, 10–11 (Wiesbaden: Franz Steiner Verlag, 1972), 1:38. For Franco, see Oliver Strunk, ed., *Source Readings in Music History*, vol. 1, *Antiquity and the Middle Ages* (New York: Norton, 1950; 2nd ed. 1965), 141. Both passages have been much discussed.

The *Magnus liber* has only one of the several types of polyphonic works found in the *Liber Sancti Jacobi* and none of the types that dominate the Aquitanian repertory. The *Magnus liber* is, as its title (as given by Anonymous IV) says, “de gradali et antiphonario”: it contains only certain liturgical categories for a series of occasions. The *Liber Sancti Jacobi*, on the other hand, contains the whole spectrum of categories for one occasion, and the Aquitanian repertory contains a variety of styles for mostly unspecified functions and occasions. Polyphonic versus are not to be found within the *Magnus liber*; in the Notre Dame manuscripts they were placed in separate fascicles and called, generically, *conductus*. Also excluded from the *Magnus liber* are the *prosaes* for responsories, such as *Portum ultimum* of the *Liber Sancti Jacobi*. But the Latin-texted discant (commonly called “motets”) of the eighth and ninth fascicles of the Florence manuscript exactly answers the description. Only the settings of “Benedicamus domino” have no fascicle of their own. New and distinctive in the Notre Dame manuscripts are the “substitute” discant *clausulas*—hundreds of them, in their own fascicles.

Within the *Magnus liber*, then, there is almost exclusive concentration on polyphonic settings of responsories for the Office and for Mass—that is, settings of melodies that either are or resemble chants of the archetype. Speaking only of the *W₁* version (here and in the following discussion), some of the Office responsories, such as *Ex ejus tumba*, are recent chants for individual saints; some of the Alleluias are Frankish chants; while most of the Gradual responsories are from the ninth-century archetype. This is novel, and the novelty has not, I think, been sufficiently emphasized. There has been a tendency to say that Leonin’s polyphony continued the traditional chant, but it was not at all traditional in the twelfth century to make polyphonic settings of Graduals from the archetype. The words of Graduals are in prose not verse, and their melodies have melismata that evade the concept of syllable count. These drastic differences would have been obvious to Leonin; he must have been well prepared to deal with them and perhaps even sought them out as opportunities to write a new and different kind of music.

In the *Magnus liber*, the upper voice (now “duplum”) is written in its usual position over the lower voice (“tenor”) with its syllables. This notation suggests that the syllabic structure is to be understood in traditional terms in spite of the differences just mentioned. There is a tendency to neglect the succession of syllables in Leonin’s work and to view syllable changes and the marks that indicate them as incidental distractions to the flow of the melisma. But the two voices do sing the same syllables at the same time, and that provides a basic large-scale form, however extended and obscured by other features.

Compared with the Aquitanian and Compostelan repertoires, the *Magnus liber* contains a great number of little vertical marks,⁴⁵ which divide certain notes from others in a confusing variety of ways.⁴⁶ The marks of alignment that were added to the earlier sources could scarcely be regarded as consistent; yet their primary function is clear—to compensate for misalignment on the page by showing how the upper-voice ligatures go with the syllables. In the Codex Calixtinus, where the alignment on the page is good, the vertical lines were added after various units of verse in the versus, or after syllables, words, or groups of words in the elaborate settings of prose; in the melismata the marks sometimes divide the melisma into comparable subphrases. If there is a tradition, it is one of expediency, not system, and we should not be surprised if at Notre Dame, too, practice is not completely systematic.

The marks in the *Magnus liber* do not go through both staves, as they do in the Codex Calixtinus; they are so small (in *W₁*) as to be sometimes hard to see. Yet something of the older long mark will be found to persist. The marks in the duplum show either a change of syllable or a division into subphrases in a melisma. Of these two uses the syllable mark is the more traditional. The division marks are the more numerous and prominent, simply because of Leonin's extreme extension of the duplum in the organum purum, with frequent division into subphrases.

The numerous marks in the tenor are less easy to understand, due to another development—of epochal significance—in Leonin's polyphonic style. Leonin began to make heavy use of elision (did he invent it?), in which the end of a unit in one voice coincides with the start in the other. In example 5 (from *Descendit V. Tamquam*, *W₁* fol. 17v [13v]), at the passage marked (a), the tenor note is sounding, and the duplum is ap-

proaching a close, which is to coincide with a new tenor note. It is as if we were approaching the end of a syllabic unit in the *Liber Sancti Jacobi*, in which the two-note problem was to be solved by the fourth possibility: the second tenor note would be sung with the end of the duplum ligature, whereupon the syllabic unit would end with a mark of alignment in both voices, and both would start new notes together. But in Leonin's practice, there is often no new tenor note *after* the mark of alignment; the tenor note that should have been the close of the unit simply continues to sound, past the mark of alignment, and in fact becomes the tenor for the new unit begun in the duplum. This constitutes the elision. Hence the

Example 5. From *R. Descendit V. Tamquam* (*W₁*, fol. 17v [13v]).

(a) (b) (c) (d) (e)

(Tam-) quam

spon -

sus do - mi -

(a) (c) (etc.)

nus

⁴⁵ For a facsimile edition of the *W₁* version, see J. H. Baxter, ed., *An Old St. Andrews Music Book* (Cod. Helmst. 628), St. Andrews University Publications, no. 30 (London: Humphrey Milford, Oxford University Press, 1931; repr. New York: AMS Press, 1973), fols. 17r–48v (13r–42v). And see also Julian Brown, Sonia Patterson, and David Hiley, "Further Observations on *W₁*," *Journal of the Plainsong and Medieval Music Society* 4 (1983): 53–80.

⁴⁶ Discussion of these has usually begun with, and seems to assume, a modal or mensural state; the function of rest—measured silence—has been seen as primary, the other functions as vestigial and peripheral. For a better approach, see Rudolf von Ficker, "Probleme der modalen Notation," *Acta musicologica* 18–19 (1946): 12; but Ficker's remarks on the pages following seem to lead to the problems mentioned in note 55 below. Frieder Zaminer presents a very elaborate, and to me confusing, discussion of the marks, in connection with the Vatican Organum Treatise, and independent of modal rhythm (*Der vatikanische Organum-Traktat* (Ottob. lat. 3025): *Organum-Praxis der frühen Notre Dame-Schule und ihrer Vorstufen*, Münchner Veröffentlichungen zur Musikgeschichte, 2 [Tutzing: Hans Schneider, 1959], 37–41).

mark *after* the tenor note (found throughout the *Magnus liber*) is a vestige of the mark of alignment that used to go through both staves: it shows the end of the unit in the two voices. If there was a syllable change just preceding this close, it will be shown by a syllable mark in the duplum—not, however, in the tenor, which being right above the syllable does not need a mark.⁴⁷ The Notre Dame idiosyncrasy of this notation is that the tenor continues to sound: the mark might be described as “close and hold” rather than “stretch and wait.”

Leonin also uses the more traditional arrangement, seen in example 5 at (b). Here the second tenor note coincides with the end of the duplum, both voices with marks of alignment. Then both voices start a new unit, and the new tenor note is also followed by a mark of alignment. As still another alternative, the second tenor note might be aligned with the start of the next unit in the duplum, *after* its mark. This happens at a syllable mark at example 5 (c), “-nus”; but it could happen in the middle of a melisma, and sometimes seems suggested in connection with a sequential figure in the duplum, as in *Non conturbetur* Ψ . *Ego rogabo*, “vobis” (W_1 fol. 19r [15r]). Allowing for what seems Leonin’s intoxication with elision, we can conclude that the mark of alignment is being pressed into service to help clarify some intense stylistic development; the mark may have several meanings, and only the context specifies which is applicable. In any case, the novel component of the meaning seems to be, “hold for the next point of coincidence.”⁴⁸

The options discussed, along with the usual ways of handling syllable change, seem to account for most vertical lines found in the organum purum of the *Magnus liber*. None of the marks implies a measured silence or, indeed, any element of modal rhythm. The needs of Leonin’s polyphonic style are met with traditional notational elements of twelfth-century polyphony. The second hypothesis presented—that ligatures can be taken

⁴⁷ In ten cases in W_1 , and often in F , a mark does show up before tenor notes; it presumably indicates, at least in some cases, a syllable change.

⁴⁸ Another traditional notation pressed into new service is the plica. Whether or not liquescence itself is involved—see the statistical discussion by David Hiley, “The Plica and Liquescence,” *Gordon Athol Anderson (1929–1981): In Memoriam von seinen Studenten, Freunden und Kollegen*, 2 vols., Musicological Studies and Documents, 39 (Henryville, PA: Institute of Mediaeval Music, 1984), 2:379–91—the plica carried over from its use in chant the idea of continuing on: a plica does not stand before a pause. As used in W_1 , the plica often ensures continuity over some kind of mark, usually a syllable mark, as in the very frequent succession *simplex plicata*—mark—binary ligature (see example 5d); here the plica makes it explicit that the mark should not be treated as a pause. I take the frequent use of plica within a long melismatic duplum extension (where liquescence is irrelevant), as at example 5e, to have a meaning derived from that just described, and to call for continuity over a subdivision.

as roughly equivalent to syllabic units of case 1a or 1b—could be applied directly to Leonin’s organum; or the hypothesis could be modified to reflect the novelties of Leonin’s style. Nothing, however, need be assumed concerning meter, mode, mensuration, or duration of individual notes (or pauses), any more than in previous polyphony.

The concern—of Leonin or of the notators—to make alignment clear in spite of increasingly complex relationships of the two voices is shown by another striking novelty in notation. Tenor notes in the organum purum of the *Magnus liber* (in W_1) are written as single notes, without ligatures. What was seen in the *Liber Sancti Jacobi* as a tendency is in W_1 the rule. All the chants involved are classed as melismatic, and though the melismata are not involved here, most of the chant notes not in melismata would also be written in ligature in chant notation. A reason for this departure from traditional procedures has already been suggested: the alignment is immensely clarified; the two-note (or three-note) problem is simply edited out of existence. This unambiguous practice of the pragmatic Notre Dame notators, incidentally, shows us that the fourth possibility had become habitual.

The disuse of ligatures is the more remarkable in the case of discant clausulas in the *Magnus liber*.⁴⁹ The type of clausula that is putatively earliest—and putatively in “Leonin style”—has its tenor written in groups of single notes (Ludwig’s “simplices-Gruppen”); the groups are separated by marks of alignment that match marks in the duplum. The tenor of this kind of clausula is a melisma in the chant, where ligatures were used most consistently in the chant notation. Furthermore, the tenor notes of these clausulas are the only ones in the *Magnus liber* (in W_1) not to have marks after each one. The marks that are used after each group of tenor notes are simple marks of alignment. They are generally assumed also to mark phrases, but they are not signs for “close and hold.” The absence of marks after each tenor note readily distinguishes these clausulas from the surrounding organum purum of W_1 .

It is worthwhile trying to imagine these clausulas at the stage, or stages, in which the modal system was coming together. Though the two-note problem has been eliminated by the use of single notes in the tenor, these clausulas might still be thought of as successions of two-note problems, that is, two notes in the tenor against more than two in the duplum. In example 6, from *Viderunt* Ψ . *Notum fecit*, “dominus” (W_1 fol. 25r [21r]),

⁴⁹ For general discussions of the clausula, see Norman Smith, “The Clausulae of the Notre-Dame School: A Repertorial Study” (Ph.D. diss., Yale University, 1964); and Rebecca Baltzer, “Notation, Rhythm, and Style in the Two-Voice Notre-Dame Clausula” (Ph.D. diss., Boston University, 1974).

each successive tenor note can be understood as a "second note," aligned (according to the fourth possibility) to the end of a duplum ligature. These second notes are chained—just as the units in organum purum are chained through elision.⁵⁰ We can understand the notation of these clausulas without reference to any of the three factors identified for modal rhythm, that is, alternating long and breve, long equal to two breves, ternary long equal to a long and a breve. All we have to imagine is a succession of moderate, more or less equal units, resembling syllabic units but without syllables. Each unit would have one tenor note and one, two, or three (less often, four or five) notes in the duplum. Under the conditions assumed for earlier polyphony, the units with four or five notes (those eventually to involve duplex longs) would be stretched slightly.

Example 6. From R. *Viderunt* V. *Notum fecit* (W₁, fol. 25r [21r]).



With the help of the context sketched out here for early polyphony, we can understand the alignment of voices in these clausulas, as well as their large-scale rhythmic movement, without using any of the three modal factors. Then we are in a position to appreciate more precisely the effect of the modal factors at the moment they were applied. When that moment was, and how the factors were applied, are questions that, for the present at least, are for conjecture. The development of a new kind of rhythmic movement in music must have involved heavy input of artistic intuition and imagination, things not easily analyzed or documented. The three

⁵⁰ The dichotomy *cum littera*–*sine littera*, which has been applied to early polyphony (Sanders, "Sine Littera and Cum Littera"), should, I feel, be restricted to Notre Dame polyphony. It seems to me that the dichotomy can be understood in a very specific and straightforward way: in *sine littera* notation the next tenor note has no new syllable and can go with the last note of a duplum ligature; in *cum littera* notation the next tenor note has a new syllable and cannot go with the end of a duplum ligature.

modal factors could have been applied singly, their relationships worked out over a period of years; or they could have come together all at once in a single master stroke. Other factors may have played a role, such as the accentual patterns in the Parisian sequence emphasized by Fassler.⁵¹

Distinguishing Leonin's handling of the new rhythms from Perotin's, and with Leonin's rhythms in mind, I believe the most definitive factor to have been not the purely modal alternation of two values,⁵² or the measurement of a long by two breves, but rather the exactly equal "ternary" longs. Once established, this long value would provide the framework within which the other two factors could become stabilized. And it is precisely this long value that seems to stand closest to the isosyllabic context I have been sketching. All that would have been required was to replace the flexible, variable "beat" derived from the isosyllabic context with a compellingly regular one. This beat, represented exactly by the single notes in the tenor, would regulate the notes of the duplum according to the now usual way of aligning the end of each ligature with the next tenor note.⁵³ A small change, but what a decisive one! Imagine the

⁵¹ Fassler, *Accent, Meter, and Rhythm*, 188–90. Leo Treitler, "Regarding Meter and Rhythm in the *Ars antiqua*," *The Musical Quarterly* 65 (1979): 524–58, suggested another way in which modal rhythm could have formed within the discant style. I agree with a basic and important principle that he enunciated (p. 554): "the periodic organization of musical time...proceeded from the larger articulation to the smaller." In this case I would identify the larger articulation as the syllable, the smaller the individual duration in modal rhythm. I disagree, however, that "in the time of the *ars antiqua*...consistent accentual meters were a normal aspect of syllable-counting verse," and I do not think that accent—by itself or in conjunction with consonance, as he described—was the formative factor for modal rhythm.

⁵² This pure modal state is not well represented in these clausulas in "Leonin-style"; they often require an inordinate amount of *fractio modi*; or, in those with three or more notes in the duplum for a tenor note, of *extensio modi*. These clausulas suggest that the pure modal alternation of long and breve was a posterior development—or a parallel one in organum purum; at any rate, not the primary, formative one.

⁵³ My position here seems to be diametrically opposed to that of Friedrich Ludwig and my logic of interpretation to proceed exactly retrograde to his, which represents the modal interpretation. He writes, "Da sich hier der T. an der Ausprägung eines strengeren Rhythmus, wie ihn die Oberstimme hier stets haben, beteiligt und sich diesem strengeren Oberstimmen-Rhythmus hier unterordnet, erklingen seine Töne hier zu einer regelmässigen rhythmischen Folge geordnet, die in 3facher Weise rhythmisch gegliedert sein kann: 1) Der T. geht in wesentlich gleichartigen langen Noten. Dann ist er in lauter Notae simplices geschrieben" (*Repertorium organorum recentioris et motetorum vetustissimi stili*, vol. 1, *Catalogue Raisonné der Quellen*, Part 1, *Handschriften in Quadrat-Notation*, [Halle: Max Niemayer, 1910; repr. as *Musicological Studies*, vol. 7, Brooklyn, N.Y.: Institute of Mediaeval Music, 1964], p. 43, italics mine). I argue, "the tenor is written in *notae simplices*; we can imagine it to go in equal values; these create a strong rhythm which controls the movement of the duplum, which—at the discretion of the singer—can go in alternating long and short values."

effect of launching into a clausula with this new marching rhythm and without the accommodation, the stretching and holding at the end of each unit. This, it seems to me, would have been the change most apt to initiate the momentum that led ultimately to the great works of Perotin.⁵⁴

Equal longs such as these have often been used, subject to discussion, for syllabic portions of Notre Dame conductus.⁵⁵ If the argument presented here is realistic, should it not have taken account of the conductus? There are reasons for and against. On the one hand, the polyphonic conductus is the Notre Dame genre that most clearly and directly continues the habits of the Aquitanian versus; the similarities are substantial and have often been discussed. On the other hand, the Notre Dame conductus repertory developed over a number of decades, simultaneous with the developments in organum and discant by Leonin as well as Perotin; the fully developed conductus is in certain respects very different from the Aquitanian versus, and the differences involve, among other things, aspects of truly modal rhythm—the kind used by Perotin. It is true that certain conductus can be dated, but as yet that has not taken us

⁵⁴ The problem of appoggiaturas, raised by Bukofzer in his review of Waite, *Rhythm*, and more recently by Sanders, "*Sine Littera* and *Cum Littera*," needs to be placed within the context sketched here—specifically within the development of the discant clausula. Arguments have typically begun with cases in discant involving clear contrapuntal situations and unambiguous modal notation, then have applied the conclusions to adjoining passages of organum and eventually to all organum—as if what was true of discant was true also of organum; but the thrust of recent research leads in another direction. Even more specific methodological problems are involved in these too general assumptions. Variant readings, of course, show only that there are variants, not that one of them is correct; arguments from variants have tended to ignore the possibilities that (1) both readings are acceptable as options, or (2) they represent successive stages of stylistic development. It seems to me that the disputed appoggiaturas in discant (of any type) need to be treated under (2), reflecting the progressive impact of the new rhythmic regularity. The principal case at issue—cadential binaria in organum purum—seems to me to belong to the earlier stage of rhythm, in which I find that the appoggiatura is in no way an "optical illusion" (Bukofzer, p. 236) or a "jarring anachronism of style" (Sanders, p. 220). On the contrary, I see these appoggiaturas to be the most concise statement of the general principle of interval movement in early polyphony, from dissonance to consonance within the unit. As for the initial appoggiatura, I take Roesner's option, "to regard Anonymous IV's recommendations as idiosyncratic or of only local, non-Parisian origin" (Edward Roesner, "The Performance of Parisian Organum," *Early Music* 7 [1979]: 180). Recorded performances that avoid the dissonance by delaying the entrance of the tenor (as recommended by Anonymous IV and Roesner) seem to me singularly ineffective and unmusical.

⁵⁵ General discussion in Sanders, "Conductus," esp. pp. 442–69; cf. Janet Knapp, "Musical Declamation and Poetic Rhythm in an Early Layer of Notre Dame Conductus," *Journal of the American Musicological Society* 32 (1979): 383–407.

far towards a diachronic layout of the whole repertory.⁵⁶ In contrast to the conductus repertory, the *Magnus liber* in its earliest extant state in *W₁* gives us a consistent, stabilized set of pieces, located at a well-defined point in the chronology.⁵⁷ The developments leading to the *Magnus liber* surely have their parallels in the development of the conductus. We need not, however, assume that the influence was all on the *Magnus liber*: there are other instances of a new development taking place in a relatively new genre, and only subsequently being applied to update an older, more established one.

⁵⁶ Ernest Sanders, "Style and Technique in Datable Polyphonic Notre-Dame Conductus," *Gordon Athol Anderson: In Memoriam*, 2:505–30.

⁵⁷ But see Edward H. Roesner, "The Problem of Chronology in the Transmission of Organum Duplum," *Music in Medieval and Early Modern Europe: Patronage, Sources and Texts*, ed. Iain Fenlon (Cambridge: Cambridge University Press, 1981), 365–99.