

# Know Your Notator\*

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I think it would be most useful for me to give you a sort of rambling account of the background from which I have come to participate in this conference as a way of approaching some of the questions I've been asked. I'll start in the middle.

In 1988 I participated in a colloquium entitled "Transformations of the Word" at Vassar College in the State of New York. The contributions all took historical perspectives on the relations between orality and writing, all of them except for mine about language exclusively, mine about language and music. The proceedings are published in the journal *Language and Communication*, volume 9 (1989), edited by Roy Harris, Professor of Linguistics here at Oxford.

I called my formal contribution "The Beginnings of Music-Writing in the West: Historical and semiotic aspects." I would like to give you some idea how I was drawn to that subject, why I used the plural (beginnings) in my title, why I referred separately to historical and semiotic aspects, and something of the broad context of problems, phenomena, concepts, experiences, and thoughts that were generated along the way.

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\* Professor Treitler presented this paper at the *NEUMES 2006* Oxford Conference on Computerised Transcription of Medieval Chant Manuscripts, held at St Anne's College, Oxford (U.K.), 27-28 June 2006 (information about the conference is online at <http://purl.oclc.org/SCRIBE/NEUMES/conference2006/>). In this, he explores some of the principal themes of the conference: uncertainty of interpretation in transcribing source manuscripts; problems in classifying neume notation types; segmentation of a chant along textual criteria; and so forth.

Among the key points he raises are: that musical notation ought to be regarded as "notational text" (or, writing without words); that notational signs might represent not the song, but rather the singing of it ... or even something that has no real counterpart beyond the notation itself; and that the transcriber needs to "know" the notator. He warns against treating quilismas and liquescents as "ornaments" to other neume forms. He gives an example of the analysis Max Haas does on a corpus of chant.

In this slight redaction of Treitler's text, material that was added by me is in brackets "[...]" or in footnotes. The dothead-notation and diplomatic facsimile transcriptions were redone by me with assistance from Deb Lacoste; by editorial decision, the neumation was aligned above the vowels and captions added.

— *Louis W. G. Barton (ed.)*

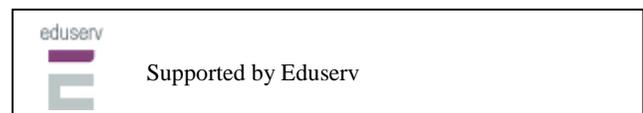
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I chose as the subject of my doctoral dissertation in musicology at Princeton University the tradition of monastic art songs on sacred and secular subjects that are preserved, often under the rubric "Versus", in southern French manuscripts of the 11th and 12th centuries. It is really the oldest tradition of European art songs to which we have access in notations that we can read, very closely related to the tradition of Troubadour songs. It is beautiful music and poetry, and its notated survivals give evidence of virtuoso singing.

The first task was to establish texts of the songs. I found twenty-five such songs that are represented with notation in at least two manuscripts, and no two sources for any song among them are identical in their notational texts. Even in the unusual circumstance where the several stanzas of a strophic song are fully notated, no two stanzas are notated identically, even when there are long melismas without words that would account for differences in musical settings. Versions sometimes seem to disagree so sharply that I wondered whether I should consider them versions at all. That question is often resolved on the criterion that they set the same poetic text (but we don't usually call all the settings of Goethe's poem "Nur wer die Sehnsucht kennt" versions of the same song. By the way, the question what might have counted as "the same" in medieval tradition is not easily answered, and certainly not by the habits and standards we apply today. I should think that might have some relevance for this Project. This question is an ever-present shadow over this subject. And then there is the hovering uncertainty whether an apparent notational difference between two versions is an intentional one—actually, since we have no better knowledge about a concept of "intention" for this period than we do of "same," I'd better put it, whether a notational difference can be assumed to have corresponded to a difference in performance. This is because the notational characters in the particular system used (staffless Aquitanian neumes) do not always come up to certain conditions that we tacitly impose upon sign systems that we would regard as notational if they are to identify the musical items they represent and to guide performances that can be recognized as performances of those items.

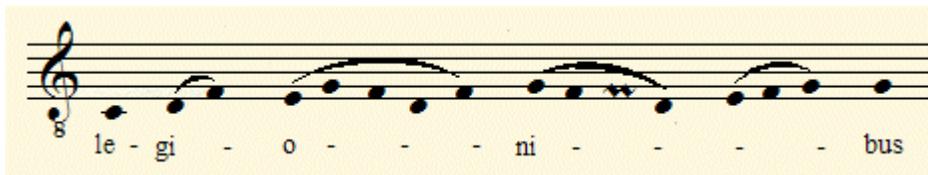
The American philosopher Nelson Goodman made those conditions explicit in his book *Languages of Art: An Approach to a Theory of Symbols* (second edition, Indianapolis 1976) and I'm going to make a little detour in my account to state them in abbreviated form. I would think they would be of interest for the NEUMES Project. In writing without words (of which notation is an instance) we can recognize signs and their referents and the relation between them which Goodman calls "compliance," such that the referent complies with the sign that refers to it. The functioning of notational systems requires basically two conditions.



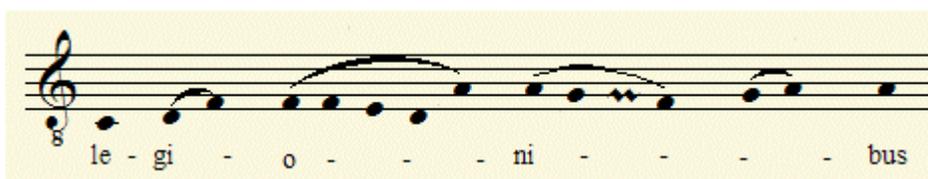
**1. Semantic finite differentiation:** both signs and referents must be disjunct, discreet. They must not fade into each other or overlap, like "dog-trainer" and "Englishman," which is why these conditions cannot apply to any natural language.

**2. Unambiguity:** the compliance relation is invariant. What referent  $x$  is referred to by the sign  $y$  is always the same.

I can illustrate the sort of conundrum that I ran into with this pair of transcriptions: (Examples 1a and 1b).



**Example 1a.** "Literal" transcription (excerpt) of the trope *Psallite omnes* for the introit *Os justi*, as written in MS Paris 1120.

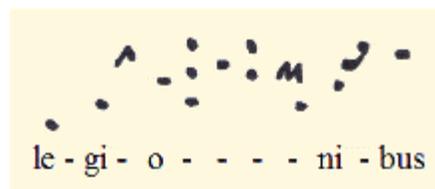


**Example 1b.** "Literal" transcription (excerpt) of the trope *Psallite omnes* for the introit *Os justi*, as written in MS Paris 909.

Both passages have the same texts and the same succession of neumes, each comprising the same number of notes with the same pitch contours (slurred groups and single notes correspond to neumes). Two exceptions: the repetition of the fourth note in Paris 909; the fifth neume has three notes in Paris 1120, two in Paris 909. The neumes are Aquitanian, which is to say that they are heightened—movement of the melodic line up and down corresponds more or less to the higher and lower placement of the elements of the neumes on the page. The transcriptions differ with respect to the interval distance from one note to the next, and that corresponds to the differing vertical placements of the elements of the neumes on the page. That is, my transcriptions assume that the heighting of the neumes respects both direction and interval distance in the melody. They are "literal" transcriptions (I'll come back to that later). Now I'm going to take an interpretive leap and try whether I can justify that assumption. On the basis of my familiarity with the melodic idiom I will claim that the version of Paris 909 is absolutely conventional and even routine for a cadential phrase in a melody in *D*: the beginning with the tone below the tonic, the outlining of the trichord *d-f-a*, the leap from the tonic *d* to the dominant *a*, and the cadence on *a*. I haven't bothered to show the original notation, I'm satisfied with the coherence and plausibility of the transcription and the phrase it shows. It is the other version that can arouse suspicion. If the version of Paris 909 is normative, there is something questionable about version of Paris 1120. Either I believe that the notator had in his mind's ear the melody I've transcribed from Paris 909, in which case I have to explain why he "heighted" the neumes but not in exact correspondence with the movement of the melody, or I believe there was a version of the melody in circulation—perhaps only in the notator's mind—that did not proceed according to the norms of the Paris 909 version of the idiom. Just a comment on the first alternative: I'm not positing a stupid person. It takes some effort on our part to imagine **not** taking for granted the principle of correspondence between vertical height

and pitch location within a tone system, the premise of our own notation, to imagine working under such a conception as new.

Let's see whether I can defend the version of Paris 1120 as I've transcribed it. I've provided a diplomatic facsimile of the original (Example 1c), to show that the notation is carefully and consistently heightened, leaving little doubt about the transcription as a "literal" reading of the notation. Now if we compare the two phrases as wholes, in place of the consistent articulation of the



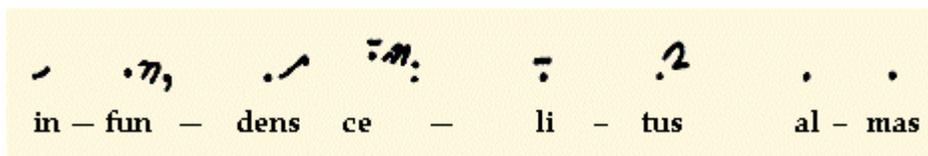
**Example 1c.** Diplomatic facsimile of source of Example 1a.

trichord *d-f-a* in Paris 909 we have an alternation of the contrasting thirds *d-f* and *e-g* in the version of Paris 1120. That can account for the fact that this version does not repeat the *f* in the third neume. But what of a phrase that begins *c*, contrasts the thirds *d-f* and *e-g*, and ends *g* in the midst of a piece in *D*? Perfectly normal in the style as a contrasting phrase that creates tension against the tonic, to which it is eventually resolved. It is also quite common in the transmission of a single phrase that there will be just this kind of variance. So I have to drop my suspicion and believe the notator of Paris 1120. Or do I? Is it just a coincidence that the passage in both versions has the same number of neumes, with the same number of notes in each, and each with the same contours in both versions but with different intervals? Wouldn't that be a strange compulsion? Perhaps it is not so strange if we think of it as a phenomenon of rapid and imprecise copying.

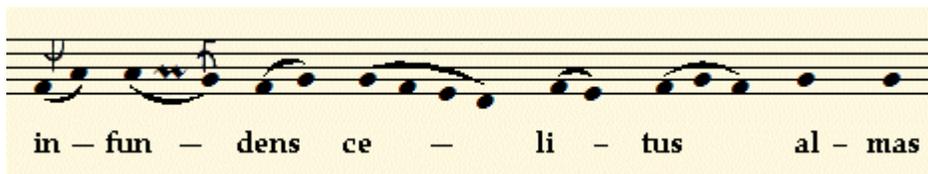
If I compare a passage from Paris 1240 with a transcription of its counterpart in Paris 909 things look both similar and different (Examples 2a and 2b, on the next page).

Again the same number of neumes, the same number of notes within each neume, and each neume with the same contour, this time without exception.

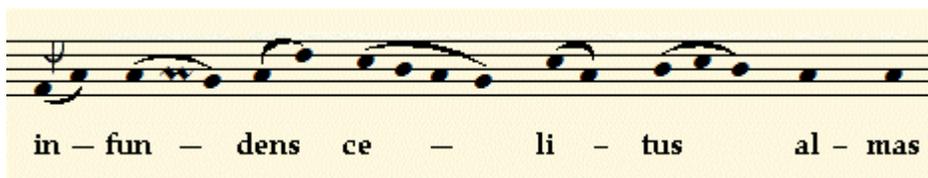
The transcription from Paris 909 shows a melody in the plagal *G* mode, the mode of the whole chant, and that is confirmed by all of the other sources for this melody, except for Paris 1240.



**Example 2a.** Diplomatic facsimile of trope verse *Discipulis flammis* for introit *Spiritus domini replevit irbem terrarum*, in Paris 1240.



**Example 2b.** Transcription from the trope verse *Discipulis flammis* for introit *Spiritus domini replevit irbem terrarum*, in Paris 909.



**Example 3.** "Literal" transcription of the source of Example 2a.

The transcription from Paris 909 shows a melody in the plagal *G* mode, the mode of the whole chant, and that is confirmed by all of the other sources for this melody, except for Paris 1240.

If I read the notation of 1240 "literally" on the premise, as before, that these are heightened neumes, it looks like Example 3.

This time I can't make the same kind of case for the coherence of the melody in accordance with a modal idiom (I should comment that this kind of juggling of the transcription against the background of the idiom was always at play). So of the two alternatives to which the preceding example led me, I have to choose the first. I can only believe that the notator of Paris 1240 had in his mind's ear or eye the melody I've written down from Paris 909, and I have to explain why he "heighted" the neumes but out of line with the movement of the melody. I'll evade that obligation and, just to convince you that it is not inconceivable that a notator writes in an explicit system but produces a nonsense I'd like to show you an show you a specimen of a very neat and precise hand, writing a very explicit notation on the staff some three centuries later (Example 4, on the next page).

This picture is taken from an Italian manuscript of the fifteenth century originating in Cividale del Friuli. It is a notation of a widely disseminated sacred song, given here in two parts on facing pages. As a paleographic item it presents certain interesting and anomalous features. First, there are the designations of the two parts as *Tenore* and *Supranus*. This is common terminology for the time, and it is consistent with the style of the letters in which those words are written down. But considered in their semantic meanings, those words do not give good descriptions of the vocal parts for which they are labels, since both parts occupy the same vocal range and cross frequently. Second, in the *Tenore* part, especially, there are vertical strokes that resemble the marks for rests in mensural notation. But if they are read as such they will produce distortions in the declamation of the words, not to mention strange rhythmic effects. The *Supranus* part is written in notational signs corresponding to the longs, breves, and

semibreves of mensural notation. But as the notes of the *Tenore* are all square and there are exactly as many of them as in the *Supranus* the presumption is that the two voices sang note against note, and the notational figures cannot have been meant to be read as the mensural figures they resemble. If one tries one can only produce a nonsense. The notation only mimics the mensural system, without indicating what that system was designed to convey to performers. In fact the example is a piece of *cantus planus binatim*, plainchant in two parts, in which 'plain' means unmeasured. It is a paleographic anomaly.

That raises the question, what does it mean that such written artefacts—this one is not unique—were produced? What is signified by the *fact* of their production? In their mimicry of the forms of notation used in centres of high musical culture they seem to say something like the following: 'The sacred chant contained in this book is presented in the lofty forms of the great musical centres, of which it is worthy, and the possession of it brings honour to this establishment.' But the notation tells us that singers would precisely *not* have relied on it for performance, but on their oral tradition.

The essential lesson is this: in a communication system in which messages are conveyed through conventional signs, neither the analysis of the intrinsic properties of the signs, nor the analysis of the contents that they conventionally convey, necessarily exhausts the meaning that may lie in an item. Factors that must also be taken into account include the circumstances of both sender and receiver of the message—their competence, their experience, their interests, their functions—, the circumstances under which it is sent, and the channels through which it is sent. The classic and indispensable exposition of this principle is the essay "Linguistics and Poetics," by the great linguist and critic Roman Jakobson. Notations like the one from Cividale, and neumatic notations in general, show Nelson Goodman's standard to be as faulty—or better, to state as much a false ideal—with respect to music, as is the "picture theory of meaning" with respect to language that has prevailed in Western culture at least



**Example 4.** Cultural affectations in music writing: square-neume notation with “Tenore” and “Supranus” parts and mensural signs.  
Source: Berlin, Deutsche Staatsbibliothek, 40592, fos. 179v–180r (cf., Vecchi and Gallo, *I più antichi monumenti sacri italiani*, Bologna, 1968).

from the time of St. Augustin’s *Confessions* to that of Ludwig Wittgenstein’s *Tractatus logico-philosophicus*.

Reflecting this onto Aquitanian notation, it is all very well to locate it in a taxonomy, but you have to know your notators, source by source. At what level, if any, is “Aquitanian neumes” a uniform taxonomic category?

This reminds me of two questions that Louis Barton put to me in our correspondence before this conference: First, “According to your table in *WV&P* [Leo Treitler, *With Voice and Pen: Coming to Know Medieval Song*; Oxford University Press 2003] on p. 358, a Nevers source (Paris 9449) is symbolic and adiaستمatic; but another Nevers source (Paris 1235) is iconic and diastematic.”<sup>1</sup> (I should explain briefly: I characterize as “symbolic” a sign that denotes its referent by virtue only of convention—any sign will do, as long as there is agreement about it and it is insulated from all other signs; I characterize as “iconic” a sign that denotes its referent by virtue both of convention and an isomorphism between sign and referent—a stop sign vs. a kangaroo crossing sign. This is borrowed from the semiotics of

the philosopher Charles Sanders Peirce. Middle Byzantine neumes are diastematic and symbolic. The only Western medieval notations that are diastematic and symbolic are letter notations. All Western diastematic notations are iconic. (I’ll come back to this distinction later.) Returning to Barton’s question, does the situation of the two Nevers sources imply that—in the general case—diastemy and iconic/symbolic distinctions are in conflict with conventional classifications like ‘Nevers’? Not at all. There is a time dimension to take into account. Paris 9449 is written in the 11th c., Paris 1235 in the 12th, no doubt by a different notator. Louis has commented that, unless one uses radiocarbon dating, the dating of MSS is unreliable.<sup>2</sup> If that is so, the whole enterprise of paleography—not only of musical notation—is out the window. The shift in Nevers—along with other places—concretizes a general shift in the early history of music writing, and it is a benefit of the semiotic differentiation that it puts this history into relief. Louis goes on: “Ought we to make names like

<sup>1</sup> “According to your table in *WV&P* on p. 358, a Nevers source (Paris 9449) is symbolic and adiaستمatic; but another Nevers source (Paris 1235) is iconic and diastematic. This would imply that—in the general case—diastemy and iconic/symbolic distinctions are in conflict with conventional classifications like ‘Nevers’. Ought we to make names like ‘Nevers’ non-exclusive across branches of the hierarchy, or should we say that (at least for our purposes) the diastemy and iconic/symbolic distinctions cannot be made at a high level in the classification hierarchy?”

<sup>2</sup> “Regarding the use of dates (or historical periods), we are, indeed, recording date-range (or specific date, if known) as part of the metadata that appear with each transcription. I have been advised that, except for radiocarbon dating or when a MS contains a liturgical feast that has a known date-of-introduction into the liturgical calendar, the precise dating of MSS is quite problematic. I believe that part of the end-result from analysis and encoding of many sources might be the inference of more reliable dates. Unless you would advise otherwise, however, I don’t think that date-range is a good criterion by which to ramify our classification of notation types.”

"Nevers" non-exclusive across branches of the hierarchy, or should we say that (at least for our purposes) the diastemy and iconic/symbolic distinctions cannot be made at a high level in the classification hierarchy?" If I have understood this, the answer is no and no; these propositions arise only because of the neglect of the time parameter. My interest in representing some part of the historical world and the NEUMES Project's interest in taxonomy ought not to be at cross purposes.

Second question: is melodic contour the lowest common denominator of all neumatic notations?<sup>3</sup> I had to answer "no," and when Louis asked me to identify the lowest common denominator, I could offer nothing more than this: an interest in writing signs—I might say diacritical marks that have some reference to some musical aspect(s) of a language text with which it is associated, or I could say an interest in making the musical aspect of a language/music medium visible, thereby separating it out from the joint conveyance through the written word alone. But notice that I may be already violating the word "**lowest**" common denominator because of the neumatation of classical texts that I've just mentioned.

We have tended to think of musical notation as a conveyor of information, asking what was conveyed, how, to whom, and for what purpose, under what circumstances, and with what assumed reader competence. The focus has been on the contents conveyed by the notation, whether or not they were conveyed in performance. But as a communication act, writing might not have depended only on its content for its effect, or its meaning as a communication act. It may have depended, at least in once sense, on the act of writing itself. In an essay published in 1997 ("Music and Writing: On the Compilation of Paris Bibliothèque Nationale, Lat. 1154," *Early Music History* 16, pp. 55-96) Sam Barrett boldly suggested that an understanding of the early history of music writing calls for "an appreciation of the written status of notational signs ... the earliest notations should be understood not only in terms of their transmission of information, but also in terms of Carolingian aspirations for, technical procedure within, and response to the act of writing... The intention of the notation (of a poetic text) may be explained by its own activity and status as writing ... marking out the written text as adding visually significance and weight to its symbolic status and rhetorical force."

We are used to assuming, or at least aiming for, an identity relation between notational image and music, between script and sound, for which the conditions were stated by Nelson Goodman.

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<sup>3</sup> "Is it a sound principle that the 'lowest common denominator' in data representation for Latin (unheighted, heighted, and clefted) and Byzantine neume notations is melodic contour, where this contour might be vague (just up/down directionality) or specific diastemy? An early proposal in the NEUMES Project was to represent, at the lowest level, the scribe's pen movement ('pen down', 'pen up', etc.); as a practical matter, we have found this strategy of representing 'pen movement' to be difficult or infeasible with Latin notations; with Byzantine notations, it seems to be even more troublesome. If there was a stable oral tradition of chant (including regional or historical variation, and the particularity of actual 'performances'), these oral traditions are lost to scholars today; is it, therefore, a realistic expectation that the fundamental comparative unit of data representation should be melodic motion?"

This habit is strong enough to resist contradiction by phenomena of music writing throughout history, because it is reinforced by the practice of composers who are our models for music—Haydn, Mozart, Beethoven (a practice, by the way, whose compliance with Goodman's model tends to be exaggerated). When it is projected onto the music of the Middle Ages it can be a source of confusion, disagreement, and irresolvable paradox. Such a paradox is presented by the situation that I illustrated with my first two examples. The many instances of that sort of situation that I encountered inspired in me a suspicion that singers working from such notations would not necessarily have rendered them in the same way each time, which is to say that they would not necessarily have rendered them "as written," they may not have read them "literally." (Again the haunting question: would 11th-century musicians have had concepts of "same," "as written," and "literal" that correspond to ours?) But it was only by reading them "literally" myself that I came to suspect that. And how could I assure that notators were notating—according to our standards of verisimilitude—what their idea of the song was? And how can I base all these conclusions on my readings of the scores as they present themselves to me, since I'm in the dark about what I might call their truth value? The strange feeling of this conundrum about the score and its contingent-yet-autonomous state vis-à-vis the state of the music and vice-versa has been caught for me by a passage in Italo Calvino's book *Se una notte d'inverno un viaggiatore* (*If on a winter's night a traveler...*).

"At times I think of the subject matter of the book to be written as of something that already exists: thoughts already thought, dialogue already spoken, stories already happened, places and settings seen; the book should be simply the equivalent of the unwritten world translated into writing. At other times on the contrary (and here is what we have not sufficiently entertained about music writing), I seem to understand that between the book to be written and things that already exist there can only be a kind of complementary relationship; the book should be the written counterpart of the unwritten world; its subject should be what does not exist and cannot exist except when written, but whose absence is obscurely felt by that which exists, in its own incompleteness. I see that one way or another I keep circling around the idea of an interdependence between the unwritten world and the book I should write. This is why writing presents itself to me as an operation of such weight that I remain crushed by it."

Returning to my dissertation, I dealt with the editorial problem by presenting a transcription—as "literal" as possible—of every song in the corpus as it appears in every manuscript. Later I came to wonder, are there alternative ways of thinking of the relation between score and performance? Charles Seeger suggested the duality of prescriptive and descriptive notations, the second being a protocol of a performance.

The first European notation of any music was certainly descriptive. But I have suggested that scores like those of my monastic songs served as *exemplifications* for performances, although they may also have been *descriptive* and *prescriptive*. John Butt, in his excellent book about "historically informed performance," *Playing With History* (University of California Press, 2002) has taken up this concept, writing, "Chopin and Schumann quite clearly viewed their notational and performance markings as offering examples of the way the piece might go rather than fixed prescriptions." By no means did he pick out those composers as exceptions, but rather finds such relationships

between score and performance from the Renaissance to the present. I've published an extensive study affirming this characterization of Chopin's practice in the *Journal of the American Liszt Society* 51 (2002) under the title "Early Recorded Performances of Chopin Waltzes and Mazurkas: The Relation to the Text." We have been too much habituated to the practices of Haydn, Mozart, and Beethoven, and of Schoenberg and Webern. In this connection it is worth Umberto Eco's book, *The Open Work*.

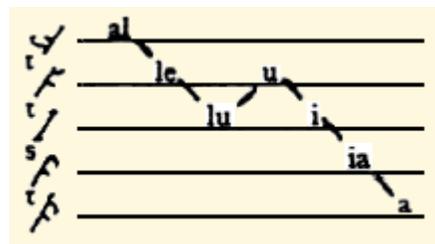
I think we can get some help with the paradox about representation and what is represented from an observation about pictorial representation that has been made by both Nelson Goodman, in the book already mentioned, and E. H. Gombrich, in *Art and Illusion* [Princeton University, 1969]. It is only when we have recognized what has been represented that we know we are looking at a representation. Here is a clear demonstration by way of an unusual bit of notation. Some years ago, on July 14, I dined with friends at the restaurant La Duchesse Anne near Woodstock, New York. At the bottom of the menu were these syllables:

*la laa la laa laa laa laaa la laa la laa laa laa laa la laaa*

What on earth do they denote?<sup>4</sup> If you don't recognize what they represent, you don't know that they are a representation. Two other things about this notation are important for an understanding about early medieval notation. First, what we've already noticed amounts to the recognition that it cues us to something we already know; we couldn't read it otherwise. Second, the choice of notational signs suggests that it represents, not the song, but the singing of it.

It is an unnatural and gargantuan ambition, what we expect of musical notation, to capture what is changing and fleeting in palpable and enduring signs. And it has its consequences. Walter Benjamin put it hauntingly that "The finished work (das vollkommene Werk) is the death mask of the inspiration." ("Die Technik des Schriftstellers in dreizehn Thesen," *Gesammelte Schriften* iv/I 107, Frankfurt 1981). It is surely that sentiment that inspires (or in the case of music ought to inspire) the love of sketches for their own sake, not only for their potential as evidence for the genesis of finished works.

Goethe spoke of this: "Worthy sketches by great masters, these bewitching hieroglyphs, are most responsible for the love of art... Here it is not a matter of drawing, proportion, character, expression, composition, finish, but rather a sign for all those which appears in their place. *Der Geist spricht zum Geiste*: mind speaks to mind" (Propyläen II, ii, 1799). The communication of musical notation is intersubjective. I'm drawn to this passage, first, by Goethe's choice of the word "hieroglyphs", which speaks of the arcane and the enigmatic. Musical notation is always enigmatic, for one has only to be willing to question it to realize how far from clear it is, what its references are and what the nature of its representation is. And I'm drawn by the last sentence, *Der Geist spricht zum Geiste*. If you would think back for a moment to my characterization of the notational transmission of my medieval monastic songs in the light of what I've just been talking about, I will characterize those notations now as sketches, without implying that they are sketches for something like finished works.



Example 5. Scalar tonal matrix from *Musica Enchiriadis*.<sup>5</sup>

The article on "Notation" in the *New Harvard Dictionary of Music* begins this way. "Notation: Any means of writing down music." Please excuse me if I wonder "What is 'music'?" in that sentence. That is, just what is it that would be written down? There can be different answers, as we have already seen. But as we read on, at least for "current Western notation" the subject of "Notation" is a relationship between signs and sounds, the latter analyzed as comprising the components pitch, duration, timbre, and loudness.

So it is sound that is written down by notation, on this definition, overcoming the enormity of the ambition. It is worth comparing this with a definition in a kind of dictionary that lies deep in our heritage, the *Etymologies* of Isidore of Seville, dated to about 600 AD: "Music is the art of measurement consisting in tone and song. It is called music by derivation from the muses (who) inquired into the power of songs and the measurement of pitch. The sound of these, since it is a matter of impression upon the senses, flows by into the past and is left imprinted upon the memory... Unless sounds are remembered by man, they perish, for they cannot be written." This has been taken—mistakenly—as evidence there was no notation in Isidore's time. I think there was not, but not on his evidence. He was simply stating a truism: one can't write down sounds.

Another early formulation worth taking at face value is given in a chapter that is transmitted, now as the opening, now as the final chapter of one of the founding documents of medieval European music theory, the *Musica enchiriadis*, *Handbook of Music*, dated to about 900: "Just as letters are the elementary and indivisible parts of articulated speech, from which syllables and in turn verbs and nouns are formed to create the text of finished discourse, so too are the pitches (ptongi) of sung speech, which the Latins call notes (*soni*) are themselves basic elements, and the totality of music is encompassed in their ultimate realization. From the combination of these notes intervals are created, and from the intervals, in turn, scales (or tone systems). Pitches, however, are not just any kind of note but those which are suitable to melody by legitimate spacing between themselves... in their rise and fall" (he means the half-steps and whole-steps of the diatonic scale). What is worth taking at face value is that the author's analogy is between the hierarchically arrayed elements of speech (letters, syllables, etc.) and those of song (notes, intervals, etc.)—i.e. speaking and singing, not the spoken text or

<sup>4</sup> Answer: La Marseillaise.

<sup>5</sup> The glyphs in the left margin are explained in Treitler's paper "The 'Unwritten' and 'Written Transmission' of Medieval Chant and the Start-Up of Musical Notation," *The Journal of Musicology*, vol. 10, nr. 2 (Spring 1992), p. 183. These are 'Dasian' signs, indicating the positions of tones within the tonal system. Understanding them is not crucial for the present paper.

the song; the action or process, not the object. When he provides a graphic example, it is a persuasively iconic representation of speech rising and falling (Example 5). We see here a display of the medieval concept of melody as the singing voice in motion as it declaims the syllables of language, and of notation—through its performative aspect—as the representation of that act, graphically isomorphic with that motion. I'll just mention two other reasons for this understanding, without being able, for lack of time, to demonstrate them. The first is the prominence in medieval writing about music of the concept of *accentus*, accent, not the modern idea of rhythmic accent but a concept borrowed from the grammar of antiquity referring to the rise and fall of the voice in speaking. The second is the central presence in medieval notations, from the beginning, of a performative aspect; we've just seen that in the notation of the *Musica Enchiridionis*. It is equally present in Western neumatic notations—in graphic representations of the direction of voice movement, and in signs denoting voice production, vowel and semi-vowel execution, pitch inflection, nuances of duration. They should not be thought of as anything but core aspects of the notation, which is a representation of singing. (This emphasis is meant as an alternative to the conception of such neumes as liquescents and quilismas as "qualifiers" or "ornaments," a conception which betrays the bias that representation in the pitch parameter was regarded as the primary task of notation.)

I said that all Western neumes incorporate a measure of graphic representation of the direction of voice movement. Byzantine notational signs do not. I've characterized this difference as one between iconic and symbolic representation, again, borrowing the semiotic conception of the American philosopher Charles Sanders Peirce. Kenneth Levy has characterized it as the difference of analogue and digital representation. Either way, it is fundamental for a taxonomy of notations of every time and place, and behind it is the equally fundamental difference between a semiotics and a paleography of notations. Louis Barton asked me to explain this further today, but there isn't time. It is set out in my book *WV&P*, with a survey of sources on this principle. The idea of a performative aspect of musical notation may be easier to grasp if we compare the neumes with the system of punctuation signs which were adapted in the invention of neumes. Punctuation signs are for us marks denoting the articulation of the structure of written language. In their medieval role they were guides to the performance of spoken language, indicating pauses and elevations or descents of the voice (in the Beneventan script, to take a most striking case, the question mark was written above the place in the sentence where the voice would be raised to indicate the interrogative sense.) Both then and now they contribute to the understanding of the meaning of what is spoken or written. But what has occurred in between is an abstraction, a decontextualization from the performative.

I'll conclude by addressing one other important question that Louis Barton put to me. He asked "Is it musicologically feasible to identify sense units [in the words and music of chants] in a consistent manner?"<sup>6</sup> This is a question about basic constituent

units of which a chant is composed, one that focuses on the semantic dimension of language—specifically syntactic groupings. In his fundamentally important paper "Toward a New View of Gregorian Chant" (*J. American Musicological Society* 33, 1980) Helmut Hucke wrote "The basic principle of composition in Gregorian chant is the division of the text into units defined by sense; the melodic phrases correspond to these text units." This is certainly correct, both as a principle of composition and as the premise of an analytical procedure. We find exactly this principle explained in the latter sense almost a thousand years earlier in the treatise "De musica" by one Johannes (*WV&P*, p. 46, note 12). It is a basis for a critical interpretation of individual chants, and that is how Hucke proceeds. But it cannot be a basis for the identification of sense units "in a consistent manner." That is we cannot assure that any sentence will fall naturally into sense units in a way that everyone will agree about. Consider this text:

*Rise, up, \ and, be, enlightened \ Jerusalem \ for, the, glory' of, god \ has, risen' over, you \.*

It is the text of the verse of a Gregorian gradual. In the setting of texts for the gradual verse there are usually at least three phrases—i.e. sense units—each of which begins with a more-or-less embellished recitation and ends with a melisma. I've marked the text where I might place a melisma ('), and where I would not (.) and where a Gregorian composer or singer actually did mark sense units with melismas(.). His choices would have depended on word and sentence accents, emphases that he wanted to make, how much he wanted to show off his vocal abilities, and who knows what else. You can see that one can't generate rules for identifying sense units consistently.

An empirical approach to the analysis of chants as strings of text/melody units—but not "sense units"—that is not open to such interpretive flexibility has been introduced by Max Haas, in his book *Mündliche Überlieferung und altrömischer Choral: Historische und Analytische computergestützte Untersuchungen* (Bern, 1996). His unit is the "Silbenstrecke," something like syllable span—the segment of melody that is sung to a single syllable, anything from one note to a long melisma. Analysis of a chant in terms of such units is a simple empirical discovery procedure not open to interpretation or differences of judgment. Its heuristic value emerges only from the result of such analysis of whole corpuses of chants. In contrast to sense-unit analysis, there is nothing illuminating about the Silbenstrecke analysis of a single chant. Haas has taken his model for this method of corpus analysis from "Taxonomic structuralism" in linguistics. As his title indicates, his corpus is the entire body of Old Roman Mass chants, taken liturgical category by category. The reason for that choice is indicated in the first part of his title: his analysis is aimed at refining what we have long understood about Old

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marked in the data)? I imagine that comparative analysis of sources by algorithm might traverse *NEUMES*-transcribed sources by their 'sense frames', and compare one source against another by aligning their sense-frames. Do you expect this approach would be useful and musicologically feasible, such that it ought to be fundamentally part of the data structure? Or, is such division into 'sense-frames' infrequently needed, and so it could be just an add-on to the basic data structure?"

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<sup>6</sup> "In a standardized markup scheme for chant transcriptions (viz., in the data), is it musicologically feasible to identify sense units in a consistent manner, so that the data can be divided into sense units (i.e., for the beginning and end of sense units to be

<b>Example 6. Summary of Syllable Occurrences (Übersicht über die Silbenstrecken), after Haas.</b>				
<i>Gattungen</i>	Total number of syllables ( <i>Silbenstrecken</i> )	Total number after discounting repetitions ( <i>Individuen</i> )	Of the Individuens, the number that occur only once ( <i>nur ein einziges Mal vorkommende Silbenstrecken</i> )	in % ( <i>gerundet</i> )
Introitus	6792	827	438	53
Gradualia	5809	1292	860	67
Alleluia-Verse	3146	583	343	59
Tractus	2041	335	169	50
Offertoria	11090	1546	905	59
Communiones	5970	1071	626	58
Total	34848	3755	3341	-

Roman chant as an oral practice. But perhaps his approach to the identification of constituent units may be useful for this Project.

Example 6 [adapted from Haas, *op. cit.*, p. 76] summarizes the rough data from his book. This should be sufficient to give you a sense of the significance of the method, but the data are subjected to very sophisticated analytical procedures that I can't possibly summarize here.

Even at a glance you can get an impression of how limited the material really is, something about the Old Roman tradition of which we have long had a general idea, and which we have understood in the light of its long oral tradition.

As an example, for the, Introids, 6,792 Silbenstrecken, 827 different individuals, 438 occur only once, leaving 389 occurring more than once. Thus 389 different melodic segments account for the settings of 6,354 of the syllables in the Old Roman Introids. (I've subtracted the 438 that occur only once.)

Taking the totals, 414 melodic segments account for the settings of 31,507 syllables in the entire corpus of Old Roman Mass chants. On the basis of such results, Haas moves from

Silbenstrecken to formulas, and produces the most detailed account yet of the formulaic character of the Old Roman chant, which, as I say, he associates with the fact of its long period of oral transmission. The next question is about the context of each syllable span: what comes before, what comes after. And from this analysis Haas evolves a rigorous definition of "formula." There is a summary on page 23 of *With Voice and Pen*.

Interestingly enough, this takes us back to sense units, the analysis of which Huckle introduced as evidence of "oral tradition." I would put it that both of these properties are clearly what made the oral transmission of chant possible, but as they probably survived into a period of written transmission we are not obliged to conclude that all chant traditions that display them were necessarily products of oral traditions. It's just not an issue for this Project.

What seems more relevant is the empirical nature of Haas's research protocol and the emphasis of both approaches on specific corpus analysis, which is in the spirit of my earlier admonition that you have to know your notator.

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