The "Premodal" Sign System of the Chansonnier de Saint-Germain-des-Prés

[19]

by

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"Quidquid agis, prudenter agas et respice finem"[1]

In the course of my work on the neume repertoire of the Chansonnier de Saint-Germain-des-Prés I discovered the key to a logical and consistent sign system, which allows us to interpret the tunes – supposedly notated without rhythm – with greater precision than was possible up to now. There are several indications that the principles of this system may constitute the general basis of all monodic notation in the thirteenth century. The principles may prove to be significant also for our understanding of Notre Dame polyphony, perhaps even of the St Martial repertoire; more on this at the end of this article. In what follows I wish to report on my research, which was limited, in the first instance, to the analysis of the signs in a single codex.

The Chansonnier de Saint-Germain-des-Prés (Paris, BN fr. 20050)[2] is the oldest surviving vernacular song book that contains musical notation; contrary to all the later trouvère/troubadour manuscripts, its melodies are not written in square notation, but in Lorraine neumes (Fig. 1). The codex was copied in the area around Metz; its older section with musical notation[3] was written already around 1235 (plus or minus five years), that is, at a time when the art of the trouvères was still flourishing. We are dealing with a compilation of songs that were actually still current at the time, classics as well as brand new pieces, not with a retrospectively created collection from the late phase of courtly song (*Minnesang*).[4] [21]

The impulse behind my research came from questions about musical practice. When we aim to recover the sounding reality of the songs, as well known, we are immediately confronted with the cardinal question of rhythm. Generations of scholars have again and again proposed new solutions to the problem of *Taktrhythmik*; in the nineteenth century these solutions involved – in roughly chronological order – arbitrary, mensuralistic, declamatory, and binary models, and then, in the twentieth century, modal, equalistic, expanded-modal, and finally non-rhythmic-declamatory conceptions. The dominance of the "free-declamatory" theory in the last twenty-five or so years is not imaginable without the guiding aesthetic image of equalistic Gregorian chant; although this is rarely stated explicitly, one can frequently detect it between the lines as an *a priori* assumption.

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[1] *Gesta romanorum*, cap. 103 (widely current Medieval adage, after Chilon, Herodotus, Plutarch, etc.).

[2] Facsimile: P. Meyer and G. Raynaud, *Le chansonnier français de Saint-Germain-des-Prés*, Paris 1892; [1]New York/London (Johnson) 1968. As trouvère manuscript it carries the siglum U, as troubadour manuscript the siglum X.

[3] Fols. 4–91.

[4] In what follows I will understand by "Minnesang" collectively the art of song of the troubadours, trouvères, and the German *Minnesanger*, including the lighter genres, to the extent that they are transmitted in the manuscripts.

[22]

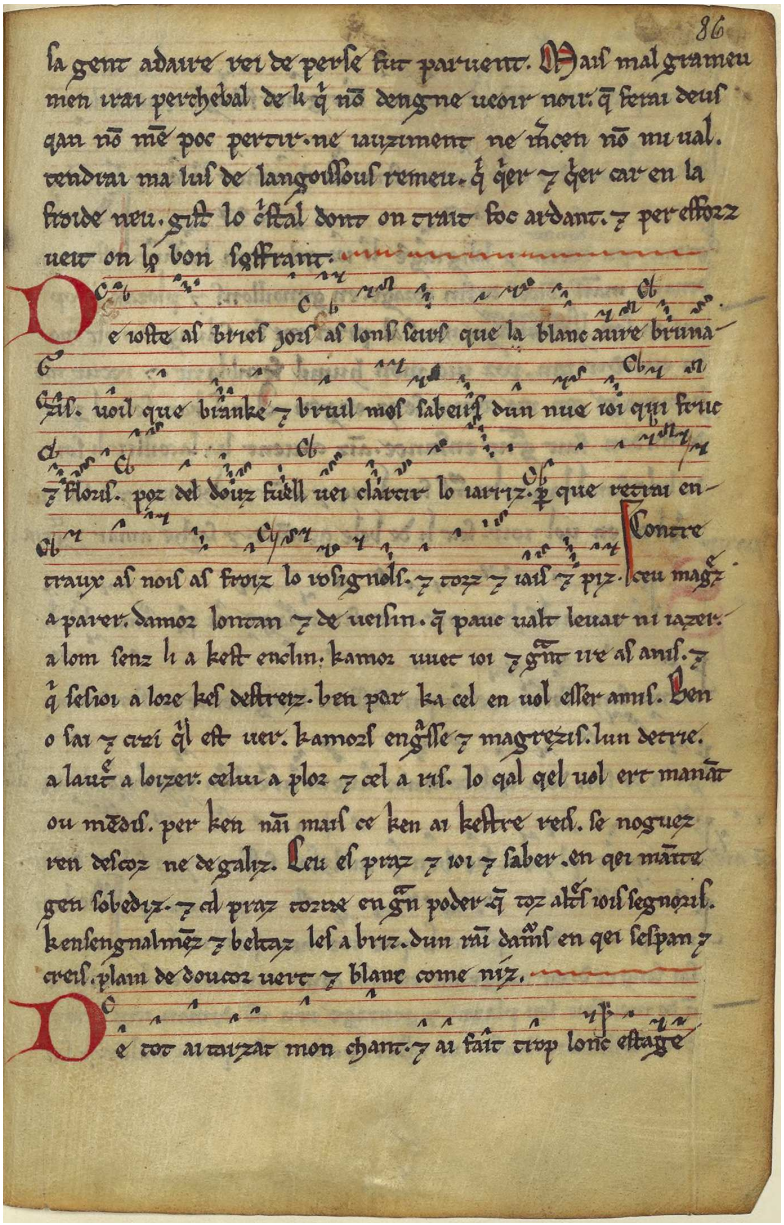

Fig. 1: Chansonnier de Saint-Germain-des-Prés, fol. 86r. [20]

At present the arena of the *Taktrhythmus* battles is filled with exhausted arguments in a mist of paralytic aporia. For that reason it would not seem an especially promising maneuver at the present time to launch a frontal attack on the question of rhythm. Yet a flanking maneuver may perhaps offer the prospect of a breakthrough.

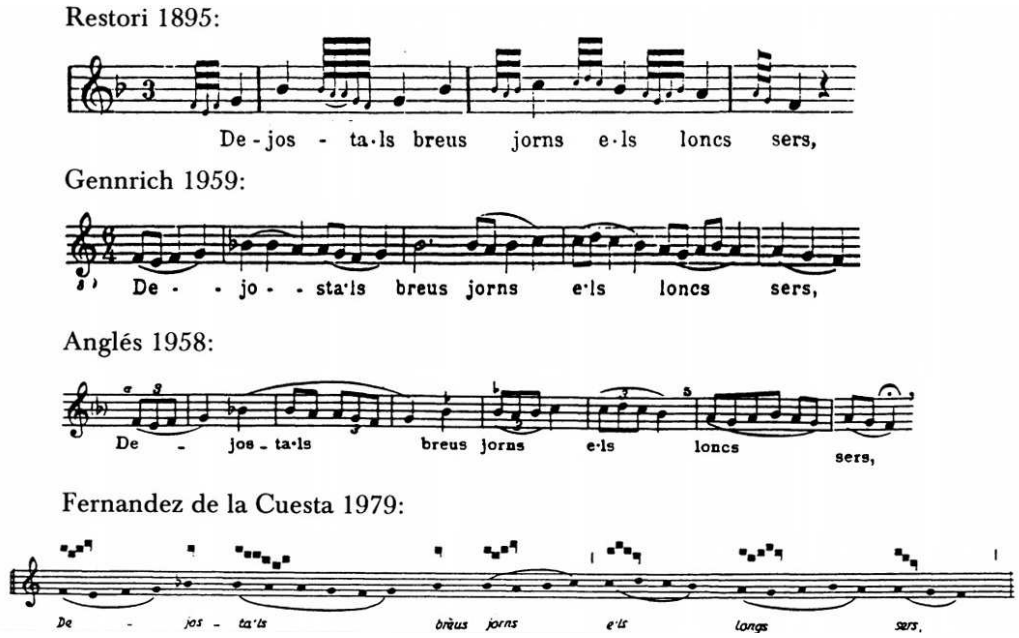

Fig. 2: Troubadour chanson in four transcriptions
(Peire d'Alvergne, PC 323.15; version of the manuscript R) [21]

What I have in mind is a return to the question of the microrhythm (*Feinrhythmik*) within ligatures. In courtly song research this question has tended to be regarded as a secondary one. Sometimes it might come up in the attempt to accommodate excessive numbers of notes in a preconceived regular rhythmic scheme, but frequently – as in the case of the declamatory conception – it seemed possible to leave it out of consideration altogether. Taking the reverse route, in this situation, that is, giving priority to the question of microrhythm, seemed to promise new insights; after its resolution it might be possible to enter the problem area of the *Taktrhythmik* from a new constellation of evidence.

In the first instance I did not seek bearings in Gregorian chant research. Since we cannot take as *a priori* accepted that there must have been connections between the written liturgical repertoire, on the one hand, and song notations as documents of a primarily oral culture, on the other, it seemed advisable to examine the area of courtly song in isolation.

Further narrowing down led me to focus on a single manuscript, whose notation could be explored systematically and in detail. Surprises were not to be ruled out.[5]

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[5] "In the semiotics of musical notation, which would concern itself with the functional relationships between the sign systems and what they signify while taking into account the situation of the person(s) to whom they signify, virtually everything remains to be done" (L. Treitler, *The Early History of Music Writing in the West*, JAMS XXXV, 1982, p. 238).

The old part of the Chansonnier de Saint-Germain-des-Prés contains the melodies for 114 songs; a count of all the signs (= syllables provided with neumes) yields a total number of 8,476 notational signs.

Of these, 59 % are single notes;[6] the remaining 40.55 % (3,437 signs) are ligatures of two or more notes, beginning with clivis and pes, up to seven-note ligatures. There are no figures containing more than seven notes.

[23] The more complex figures are exceedingly rare: altogether we find only five seven-note and eleven six-note ligatures. Five-note ligatures, of which there are only 59, can be regarded as exceptional as well. Taken together, the five-, six-, and seven-note ligatures make up less than 0.9 % of the total number of signs.[7] Even the four-note ligatures, as a group, do not constitute a greater share than 2.03 %.[8] The song melodies, then, consist of single notes and two- and three-note ligatures for a good 97 %.

These statistical data may suggest the degree to which melodic formation in troubadour and trouvère songs is different from the Gregorian repertoire; a separate approach, therefore, seems required also because of the different nature of the available vocabulary of melodic figures.[9] However, in the course of this discussion we will also encounter indications pointing to connections between these two repertories. For example, the constructive principles ruling the more complex signs, even the unica, are perfectly consistent. Besides, a detailed analysis does not yield any indication that the writing of the exceptional figures presented any kind of difficulty to the notators; on the contrary, the cursus of the script testifies throughout to ample experience. These facts would be inexplicable without some connection with ecclesiastical notational practice. But let us not preempt later conclusions.

For those concerned with practical issues, the first question must be: do the ligatures signify "melismas," that is, chains of notes of approximately equal weight and equal duration – or do they signify notes of different weight, possibly "ornamented single notes," in which case we would have to distinguish between structural and ornamental notes? A systematic analysis of the sign repertory of the Chansonnier de Saint-Germain-des-Prés makes allows us to answer this question.[10]

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[6] Puncta: 58.78 % (4,982 signs); bipuncta: 0.07 % (6 signs); liquescent puncta and liquescent bipuncta: 0.6 % (51 signs: 6 upward liquescent and 15 downward liquescent puncta; 13 upward liquescent and 17 downward liquescent bipuncta).

[7] 75 signs = 0.88 %.

[8] Including all those with bipuncta: 172 signs.

[9] There are further conspicuous differences; one example may suffice: the pes occurs exclusively as a figure for stepwise progressions (with the exception of two third-leap pedes in a later addition). There is no trace of pedes involving the leap of a fourth or fifth, as is so common in plainchant.

[10] The chain of reasoning that is reduced to its essentials here in sections I-IV can be found in a more richly documented exposition in my work *Der Chansonnier de Saint-Germain-des-Prés (Paris, BN fr. 20050) – Edition seiner Melodien mit Analysen zur "vormodalen" Notation des 13. Jahrhunderts und einer Transkriptionsgeschichte des europäischen Minnesangs*, 3 vols., Frankfurt am Main (Lang), 1995, in press. Of the altogether seven deductive stages, only the four that are codex-immanent will be sketched

I

A systematic classification of all the signs (Fig. 3), beginning with the punctum, and then proceeding with two-note figures all the way up to the most complex signs, may [25] serve as a basis from which to proceed. For the sake of visual clarity this table employs conventional transcription in neutral notation.

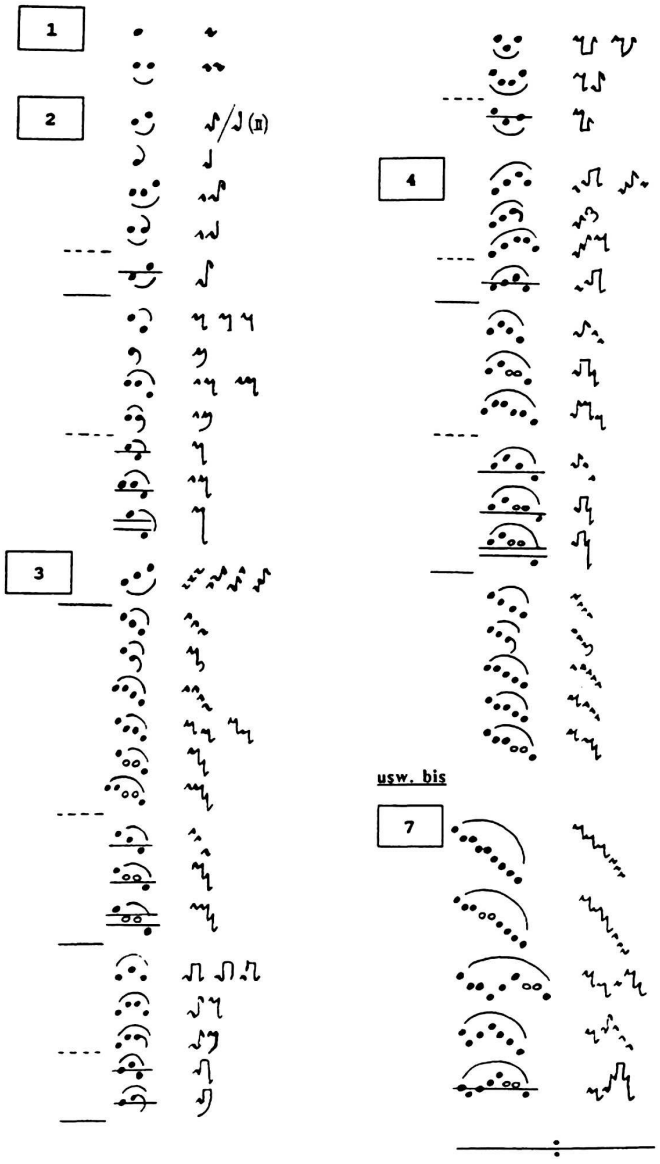


Fig. 3: The repertory of figures used in the Chansonnier de Saint-Germain [24]

here (the remaining three fall under the aspect of “traces of orality”: the *tenor* in Guido of Arezzo; brevis/longa and proprietas/perfectio in modal notation; recent song traditions in the British Isles).

Altogether we find – without graphic variants – 81 different note-figures when we take into account intervallic differences. If we ignore intervallic differences, then the sum total is 63.

In this labyrinth a pattern seems to emerge. The list of neumes shows a notable peculiarity with regard to the "doubled notes" (bipuncta: Fig. 4, arrow).[11] Altogether 27 of the 63 figures (43 %) contain these note-doublings (*Bipunktierungen*).

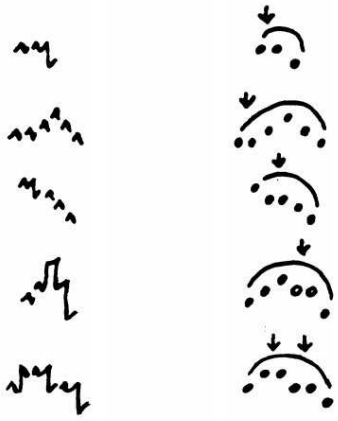


Fig. 4: *Bipuncta* (examples) [25]

In courtly song research, the existence of these bipuncta has tended to be commented upon, if at all, with a certain sense of despair. None of the rhythmic theories had any use
[26] for them; occasionally scholars would be content to explain bipuncta away as modes of performance. The phenomenon has not so far been subjected to systematic enquiry. The only point that is agreed upon is that bipuncta must in some way indicate length – but length in relation to what? At present it is generally assumed that the bipuncta (in accordance with the presumed "iconicity" of the notation) must be about twice as long as all other "pitches."[12] But two things are noteworthy about the bipuncta in the Chansonnier:

[11] I designate as *"Bipunktierung"* not only the successive occurrence of two puncta of the same pitch at the beginning of a neume, but generally the successive occurrence of two note signs of the same pitch in the course of a ligature. This includes, therefore, all cases of an "equal-pitch suffix": punctum + clivis, biclivis, clivis + climacus, etc.

[12] For Hendrik van der Werf, who is the chief representative of the free-declamatory doctrine, bipuncta are especially paradoxical; after expounding his theory of the approximately equal value of all notes, he adds: "However, the medieval scribes conveyed an important bit of information by writing a few pitches with double notes. ... From this we may conclude that some pitches were approximately, but not precisely, twice as long as the others" (in: S. N. Rosenberg, S. Danon, eds., *The Lyrics and Melodies of Gace Brulé*, New York/London 1985, p. 342. Similarly van der Werf in *The Extant Troubadour Melodies*, Rochester 1984, p. 13). The analysis proposed here will arrive at a different conclusion; there will an unequivocal answer also to the controversial question of repercussive or contracted performance (below, n. 34).

The Chansonnier de Saint-Germain-des-Prés contains exclusively *bipuncta*, never *tripuncta* or further repetitions.[13]

***Bipuncta* may be found at the beginning of a sign, or within the course of sign, but never at the end of a sign.**

Why never at the end? This curious finding allows two possible inferences:

1) The last note of a ligature[14] is never long. Or:
2) The last note of a ligature is generally long; it was not necessary to notate this, because it was a matter of "what was tacitly accepted in oral practice."

II

It is possible to decide this issue with the help of song endings. The last notes of song stanzas, as a rule, are long. This stands to reason from everyday experience; for the Middle Ages we may in addition point to the significance of the finalis as the goal and point of repose of songs – a fact which theorists described with rare unanimity. Fig. 5 shows what can be observed in the Chansonnier de Saint-Germain. [27]

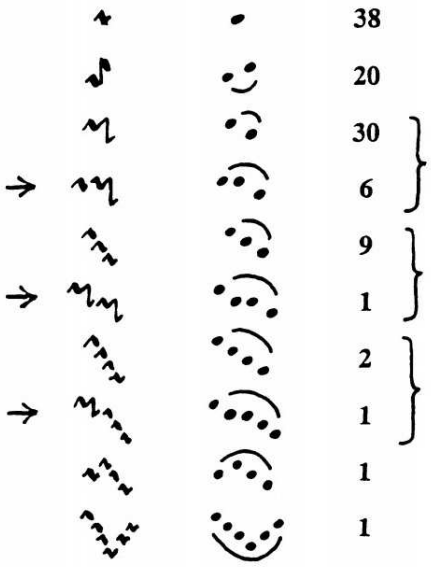


Fig. 5: Signs used for song endings in the Chansonnier de Saint-Germain [27]

[13] Multiple repetitions are frequently found in Gregorian chant and occasionally in passages *sine littera* in the Notre Dame repertoire.

[14] In what follows, "ligature" will be synonymous with "*Mehrtonverbindung*." A differentiation between ligature and conjunction is of no consequence for the syllabic figures at issue here.

Of the 109 completely-notated songs[15] in the codex, 38 end on a single note; this note is always written as a punctum, never as a bipunctum. The remaining 71 songs have a ligature on the last syllable:

Twenty songs conclude with a pes, thirty with a clivis, six with a pressus.[16] Ten songs conclude with descending three-note ligatures; nine of these show the normal form of the climacus, and in one case we are dealing with a biclivis elongated in the middle. Four songs conclude with four-note ligatures; one with a six-note figure.

Consequently, given that the notators of the Chansonnier de Saint-Germain never write a bipunctum for the final note, or characterize it as long in any other way, we may draw the following inference:

[28] **In those cases where the ending of a ligature is definitely long, the fact that it is long is not notated as such.**

The hypothesis of the long final note, as a case of "what was tacitly accepted in oral practice," thus receives substantial support (numerically speaking, in 71 cases).

The second inference concerns the three final signs that have a bipunctum at the beginning or in the middle (arrows in Fig. 5). Their fairly frequent occurrence (altogether eight times, that is, 11.3 % of the ligature endings) shows, on the one hand, that we should not understand the endings as melismas that arrive at the final point of repose by slowing down *ad libitum*; rather, relative note durations are carefully indicated even on the last syllable: pressus is distinguished from clivis, climacus from biclivis, and in the case of the descending four-note series, the normal from from the one whose second note has been lengthened (brackets in Fig. 5).

On the other hand, the final signs that involve bipuncta give a particularly strong indication regarding the length of the final note: immediately before the final, within the same ligature, long values are indicated by means of bipuncta – which would have created a paradoxical effect if the final note were to have been short, as the notation indicates *in appearance* only.

The principle of construction of the notators is brought into focus in the concluding figures: One can read from one and the same sign that long values have to be notated when they occur at the beginning or in the middle, but never when they occur at the end. Evidently it was somehow "known into" the ligature.

III

In order to rule out that this conclusion might be valid only for the special case of song endings, we must now examine ligatures at any other point in the melody. For this we may employ the method of comparing melodic parallels. The principle is shown in Fig. 6.

[15] There are five songs of which only the beginnings have been notated.

[16] The term stands for "doubled-note clivis." I prefer the designation "pressus," since it brings this very characteristic sign in the vicinity of the pes, clivis, climacus, etc., where it functionally belongs. In the thirteenth century there is no danger of terminological confusion with regard to the pressus.

Repetitions of melody parts within one and the same song are found especially in *Stollen* repetitions but also at various other points. Notators have never shown a particular concern to "normalize" such repetitions, and as a result one can observe numerous variants. For the question at issue here, the variants that are significant above all are those where single notes are found in the place of ligatures, or the other way round. When the single note corresponds to the final note of the ligature (as in Fig. 6, asterisk), then this would confirm the hypothesis of a general and self-evident melodic center at the end; if the parallels follows no apparent pattern, then this would speak against that hypothesis.

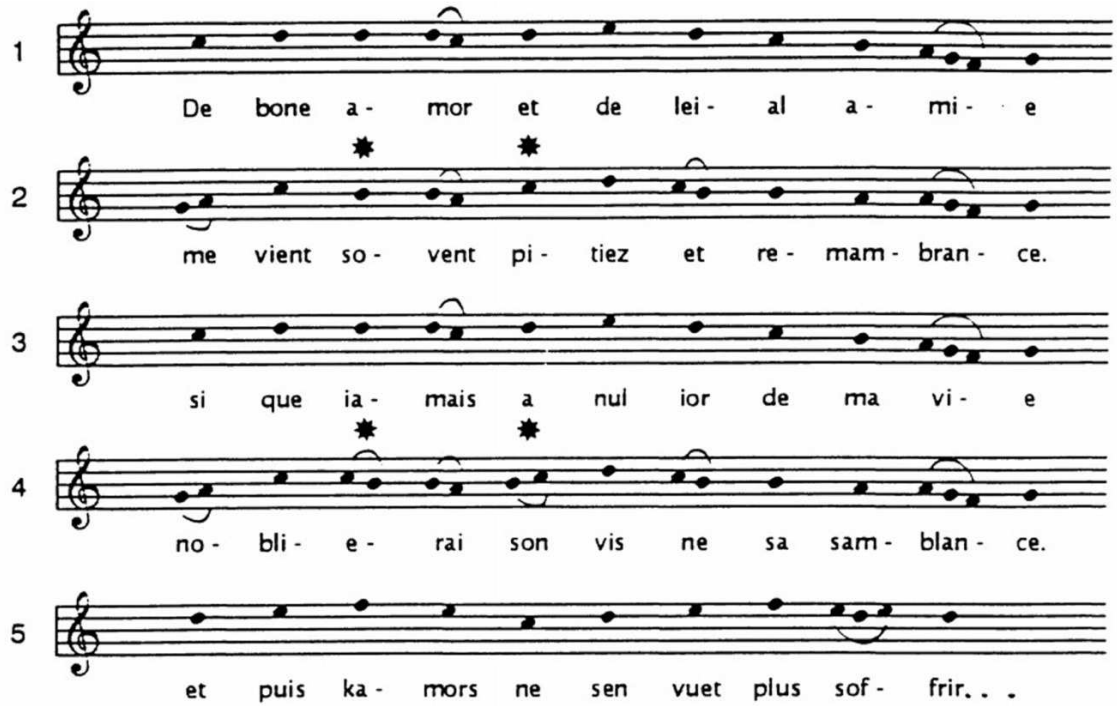
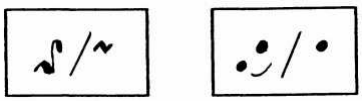


Fig. 6: Variants in *Stollen* repetitions (in neutral transcription)[17] [29]

To throw light on this question I have examined all comparable passages in the 114 songs. Here are the results:[18] [29]

1) Pes/Punctum:



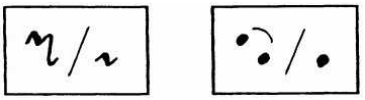
11 passages support the final-note hypothesis,
2 (exceptional cases) speak against it

[17] Chansonnier de Saint-Germain, fol. 10r (Gace Brulé, RS 1102).

[18] In what follows I have presented only the multiply occurring variants, and have omitted singly occurring cases. For this, see C II 5 of my edition (showing all variants, inclusing shifts of passages, etc.).

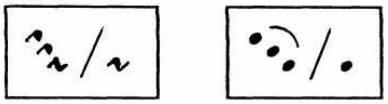
[30]

2) Clivis/Punctum:



For: 22 passages. Against: 4 passages.[19]

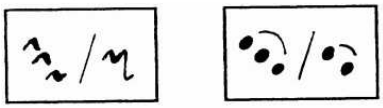
3) Climacus/Punctum:



For: 3 passages. Against: none.

The preponderance of passages that confirm the hypothesis is significant; the number of exceptions remains within the range of variation that might have been expected.[20] Of further interest are the following results of the comparison of variants:

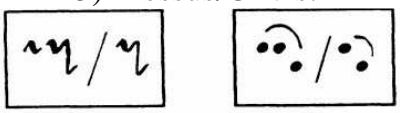
4) Climacus/Clivis:



For: 2 passages. Against: none.

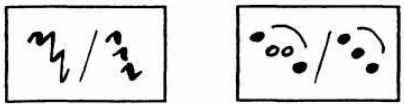
[31]

5) Pressus/Clivis:



11 times, each time on the same note location.

6) Biclivis/Climacus:[21]



4 times, every time on the same note location.

[19] See the following note.

[20] Variants like, for example, Punctum c/Punctum b, are encountered quite frequently. – Regarding the four deviations in the clivis/punctum variant: the clivis has a particular "tendency to variation" because it aims toward the (low) structural note from the position of the *high note*. Every practical attempt shows that a short high note before the structural note (clivis) stands out "more prominently," or receives greater emphasis than a brief low note (pes). In the four passages in question we find the additional special circumstance that we are dealing with liquescent neumes throughout; the complete clivis sign here represents the less frequent liquescent form. It is not just this commonality, but especially the ratio 4 : 22, which shows that these are exceptions from the rule – the rule being the dominance of the final note.

[21] The ligated-abbreviated form of the biclivis (in the system, below Fig. 11, sign no. 5.1; cf. note 38) is not identified as a special sign in conventional neutral transcriptions; either it is treated like the climacus (three note-heads) or like the written-out biclivis (four note-heads). To distinguish these for the time being, while using neutral transcription, I have used void note-heads in the abbreviated passages (thus also in Figs. 3 and 4).

The two *bipunctum* variant groups 5) and 6) provide an especially strong indication in favor of the long value of the endnote. Ought one not assume (in the case of the pressus and biclivis) that the additional weight on the bipunctum would have caused variants to place weight precisely on the penultimate and not on the final note?[22] Instead of this we find the "fundamental sign" variant throughout (that is, clivis or climacus), whose weight rests on the final note, as can be shown in systematic fashion.

So the final note – or so we may conclude from this – carries the chief weight also in the pressus and biclivis.[23] This is not, to be sure, apparent from the graphic appearance; it is only the known long value of the final note that allows a correct interpretation (more on this below, IV c). The result of our third step, then, is as follows:

The tacitly understand long value of the final note, in oral practice, is confirmed as the general principle of ligature construction in the Chansonnier de Saint-Germain.

Detailed comparison of individual figures yields further conclusions: [32]

The chief note (or structural note) at the end of the ligature is a "long," the notes preceding it are "shorts," or ornamental notes, unless they are turned into bipuncta and thereby also characterized as chief notes.

Contrary to graphic appearance, the use of bipuncta does not provide greater weight to the note in question than the implicit weight given to final notes. Both indicate – the final weight as a tacit oral assumption, the bipunctum as a graphic way of highlighting – the structural notes of ligatures. Signs with bipuncta thus contain at least two or (if there are two bipuncta in one ligature) three structural notes.

The final notes of ligatures have the same rank as single notes (syllable-carrying, unornamented notes).

NB: "longs" and "shorts" are not to be understood in terms of a proportionally fixed relationships. What it means is rather a difference in functional emphasis, which may be expressed in note duration, accentuation, or both – a continuum of uses that the notation seeks to convey with a flexibility that does justice to musical practice yet is nevertheless still quite precise.

As a matter of fact, it does seem that we are dealing with a fundamental law of oral song. Guido of Arezzo already describes a *tenor* (extension of note duration) on the final notes of every *syllaba*.[24] With regard to the early notation of sacred music, the discipline of "Gregorian Semiology" has been working slowly and carefully on the significance of the final note, which tends to be understood, under the key term of "syllable articulation,"

[22] For example, for pressus ccb punctum c, biclivis cbba clivis cb.

[23] Apparent confirmation: the double variant in Song No. 95 (fol. 51r), line/syllable 2.3/8.3/10.5: pressus ggf / clivis gf / punctum f.

[24] *Micrologus*, Chapter 15. Discussed at length in Part C II 2 of my edition.

as the melodic goal of the ornamented progression.[25] Here we are dealing, just as in the case of secular song, with a principle of emphasis accommodating speech, in which syllables would naturally be reinforced at the end and would thus feature a slight slowing-down or emphasis that led towards the next syllable: "Flo-o-**o** – re-e-**et** si-i-**il** –
[33] va ...," "O du schöner We-e-**es**-terwald." Due to changes in musical writing this principle is no longer self-evident today.

IV

The results obtained so far by comparative means receive impressive confirmation from the comprehensive systematicity of the signs.

The suspicion that there might be a hidden principle of organisation or construction at work in the sign labyrinth of the Chansonnier de Saint-Germain-des-Prés took on increasingly firm shape during the analyses. What was notable above all was the graphic assuredness of the notators; combined signs, often quite rare figures, were constructed with evident consistency, and appeared with identical construction in locations that were far apart. Yet there was not as yet a plausible explanation as to the principle according to which the elements were put together in so consistent a fashion. The written tradition of the entire song corpus could not have provided a prior foundation: all troubadour/trouvère manuscripts yield the unanimous conclusion that these were compiled from heterogeneous sources.

Did there then perhaps exist a generally practiced "musical orthography" for the notation of orally transmitted or newly created song tunes? One prior consideration seemed to argue in favor of that possibility: around 1200 the quantity of "new music" in Northern France grew on an unprecedented scale; this repertoire was in part dependent on notation (composed polyphony) and in part considered worthy of notation (monophonic conducti and others). Applied in the first instance to the art of educated clerics, this notation-worthiness soon comprised the secular art of song of the nobility (trouvères, troubadours), which achieved classic status around the same time and was frequently connected with the sacred musical art.

This massive new task was bound to prompt a change in the function and quality of musical writing: up to then it had served chiefly for the copying[26] of the liturgical repertory that had been transmitted and canonized in written form (writing > writing), but the new challenge now was the notation of "new" music (ear > writing). At the same time it seems that the number of scribal workshops and notational specialists multiplied. Given

[25] Cf. the contributions of R. Fischer, *Die rhythmische Natur des Pes* (pp. 34–77), J. B. Göschl, *Zum rhythmischen und ästhetischen Problem der Silbenartikulation bei aufsteigenden Neumen* (pp. 179–221), N. Albarosa, *Aspetti dell'articolazione sillabica sui neumi discendenti* (pp. 222–37), in: *Festschrift Eugène Cardine*, St. Ottilien 1980, as well as the publications of the three authors in: Beiträge zur Gregorianik I (1985), pp. 43–102, II (1986), pp. 5–25, and III (1986), pp. 52–72. But the chant specialists still distance themselves from the understanding of song figures in the sense of performative ornamentation as it is manifested in recent traditions.

[26] Including transcriptions and redactions.

these prior considerations, it stood to reason that musicians would have endeavored to develop, as much as possible, a practicable (uncomplicated), general, and easily distributed system of signs.

The key to this hypothetical systematicity was not easily found, however. In pursuing [34] that key, several possible classifications of the neume corpus presented themselves, from a simple listing according to sign lengths (see Fig. 3), via groupings according to graphic elements, to the outlines of unified "genealogies."

1) Impossibility of a system of suffixes.

Let us first sketch one attempt whose results seemed to come close to the actual state of affairs yet in the end proved fruitless; this may serve to establish immediately that it is not possible to find a consistent system of organisation if one projects the wrong principle. The endeavor was to find a system of organisation in which the notational figures would be characterised in terms of the *beginning of the ligature*.[27] By progressively appending more and more elements at the end of the sign – following, in other words, the principle of the suffix – it should then be possible to obtain coherent patterns of ramification branching out all the way to the complex signs (Figs. 7 and 8).

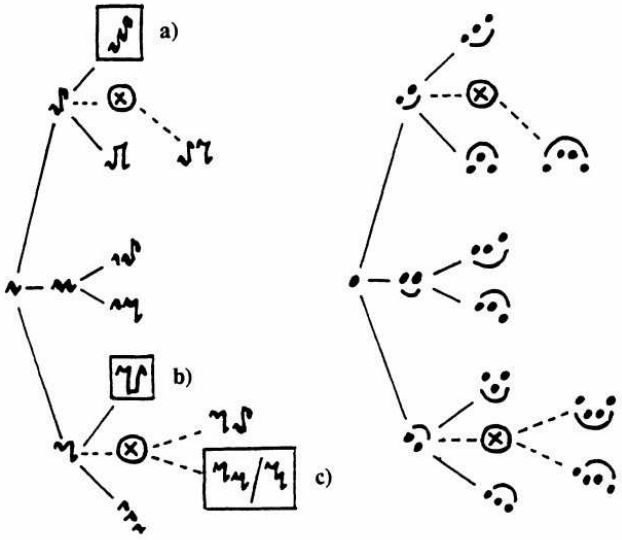


Fig. 7: Basic ramification pattern[28] of an attempted "suffix system" [34]

[27] The characterisation of signs in terms of their endings seemed up to then as (tacitly) self-evident and is mirrored, for example, in Gregorian terminology: the designations "climacus resupinus" ( ), "pes subpunctis" ( ), etc., betray an interpretation of the larger signs as "basic neume plus suffix."

[28] For the sake of visual clarity I have not constructed here the entire scheme with its further ramifications. Fig. 8 shows the examples of scandicus (a), porrectus (b), and the biclivis (c); the connection points are framed by boxes in Fig. 7.

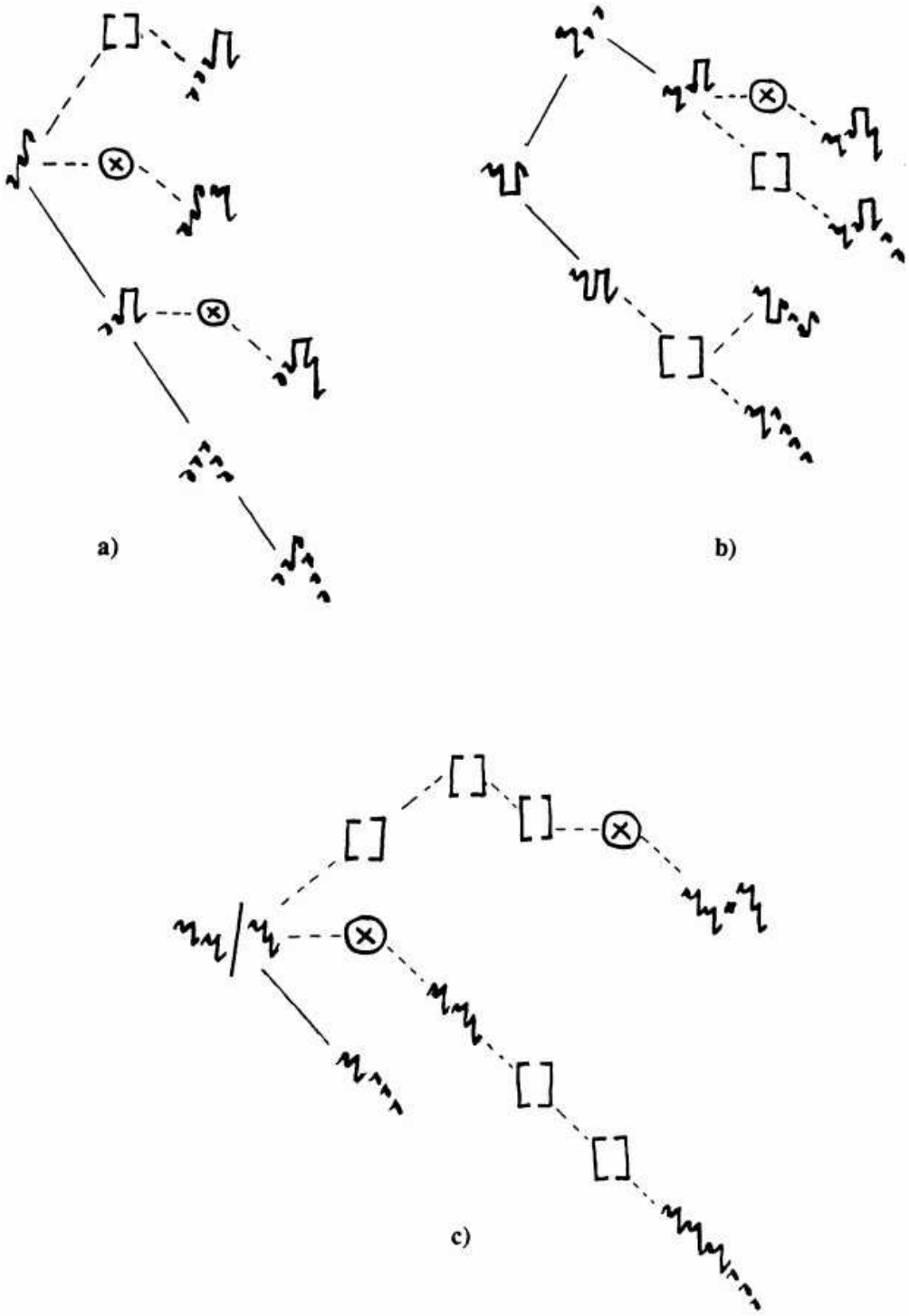


Fig. 8: Inconsistencies in a system of suffixes:
suffix branches of the scandicus, porrectus, and biclivis [36]

Although there appeared logical connections in places, there were fundamental flaws that seemed hard to dismiss. The principle of ramification, which was generally binary in nature (upward/downward), was persistently violated by the bipuncta signs. It became necessary to posit hypothetical intermediate links featuring a double final note (⊗ in Figs. 7 and 8).[29] Several branches consisted predominantly of “missing links”: signs that are theoretically possible in terms of their construction but nevertheless remain unattested (marked with square brackets [ ] in Fig. 8). This was especially jarring in the ramification pattern of the biclivis (Fig. 8c). [35]

Signs that evidently belong together graphically appeared randomly scattered across several different branches – notable especially with the signs that have the conspicuous torculus element ; see the various different positions in Figs. 8a and 8b (further incidental occurrences can be found in the branches not shown here).[30]

2) The Sign Tree according to the final-note principle

It was only the growing realization of the central importance of the final note that led to the idea to approach the system of signs the other way round: from the ending, by attaching before it successive *prefixes*. The result is shown in Fig. 9.

All the figures arrange themselves into the outline of a Sign Tree. Proceeding from the punctum, the single note sign, we position in each case a note *before* it. This prefix note may be on a higher pitch, the same pitch, or lower pitch; at every point, therefore, there are three possible branches.[31]

[38]

Prefixes with equal pitch lead to bipuncta; their existence follows directly from the logic of the ternary ramification system.[32] One observes the economy with which notators use this logic to fashion the double notes with the indication “structural note” (length).

All branches are perfectly consistent until the fifth generation, without the need to posit connecting links that were left out in practice; only at the end do we encounter four large figures whose genealogically prior signs are not attested in the chansonnier (dotted lines). The notational precision extends even to details: the graphic micro-elements, as a rule, are used for the construction of larger figures, and the characteristic endings of the signs remain graphically consistent; this can be demonstrated by the example of any of the branches.[33] The system of rules of the notators can be summarized as follows:

---

[29] The two hypothetical signs in Fig. 7 would have been: “ ” ( ) and “ ” ( ). However, there are no bipuncta at the end of any of these signs.

[30] It remained inexplicable, for example, why the two bottom signs in the scandicus branch (a) did not show the torculus element.

[31] Not that the three possibilities are always necessarily realized; for the non-existent ones there are certain practical-utilitarian grounds that must be normative: the figures in question would have been either generally wrongly proportioned and unvocal – as can be easily demonstrated through trial and error – or they were incongruous with the date and geographic area of the style.

[32] Bipuncta at the beginning become internal bipuncta through the addition of prefixes above or below. The addition of an equal-pitch prefix at this point would be foreign to the system.

[33] The torculus family appears especially consistent, as well as the branch of the “torculus pressus” ( ) within the pressus family; the identity of the basic figures remains recognizable throughout the

Rule I (basic principle): the last note of the ligature is always the structural note; it is "long." The preceding ligature notes are ancillary notes (ornamental notes); they are "short." The structural note of a ligature has the same rank as a syllable-carrying single note (simplex).

Rule II (exception to I): If one of the notes that precede the structural note is to be designated as structural ("long") as well, then it is to be notated as a bipunctum.

The distinction here between "longs" and "shorts" concerns exclusively the relationship between ligature notes to each other, that is, of notes that belong jointly to *one* syllable; it does not apply to the relationship between syllables. The notation represents only "micro rhythm," not macro rhythm of measures.

Should one wish to characterize the notation in semiotic terms, then the terminology of Charles Sanders Peirce presents itself, which was introduced by Leo Treitler in neume
[39] scholarship. Peirce/Treitler distinguish between iconic (visually depicting) and symbolic (signifying by convention) signs; accordingly, the notation of the Chansonnier de Saint-Germain can be characterized as *iconic with two non-iconic components* ("final notes and bipuncta signal chief notes").[34]

In medieval music theory, on the other hand, one looks in vain for a description [of this principle]. We today are often disappointed when it comes to explanations of things that were self-evident long ago – and this notational principle is so simple that it scarcely needed a formal exposition. The Sign Tree, too, was one that no notator would have needed to map out in writing; after all, the graphic consistencies take shape "of their own accord" in all branches. Yet we do encounter some indications when theorists write about more complex issues, and then refer back to normal practice – as when, for example, Franco quite emphatically derives the graphic shapes of his ligatures from *musica plana*.[35]

---

successive prefix expansions. It is noteworthy as well that these shapes occur exclusively within their own families: intrinsic proof of the consistency of the Sign Tree. Further confirmation is obtained when we consider the function and position of related figures in pieces that are far apart. The sign  (expanded porrectus), for example, is found only on accented syllables, and predominantly also on accented rhyming syllables; its two augmentations and  (which occur altogether twelve times) likewise are found only on accented rhyming syllables.

[34] L. Treitler, *The Early History* (n. 5), pp. 239–40 and passim. We cannot discuss here whether the long value of the final notes should be classified under the symbolic or the indexical (Treitler's third) category. However, the question as to how the bipuncta are to be performed, which had remained unresolved until now (see n. 12), receives an unequival answer. Since bipuncta serve as a *symbol of chief notes* (of the same rank with single and final notes), the possibility of an "iconic" (in this case: doubly iterated) interpretation must be rejected.

[35] CS I, p. 124 a/b: the normal shape of the ligatures (= cum proprietate, that is, short–long), according to him, was "a plana musica data," and: "ligatura cum proprietate essentialiter differt ab illa, quae est sine, ut rationale animal ab irrationali." Regarding the universality of the system of the Sign Tree, see the final section of this article; for *musica plana*, see also n. 56.

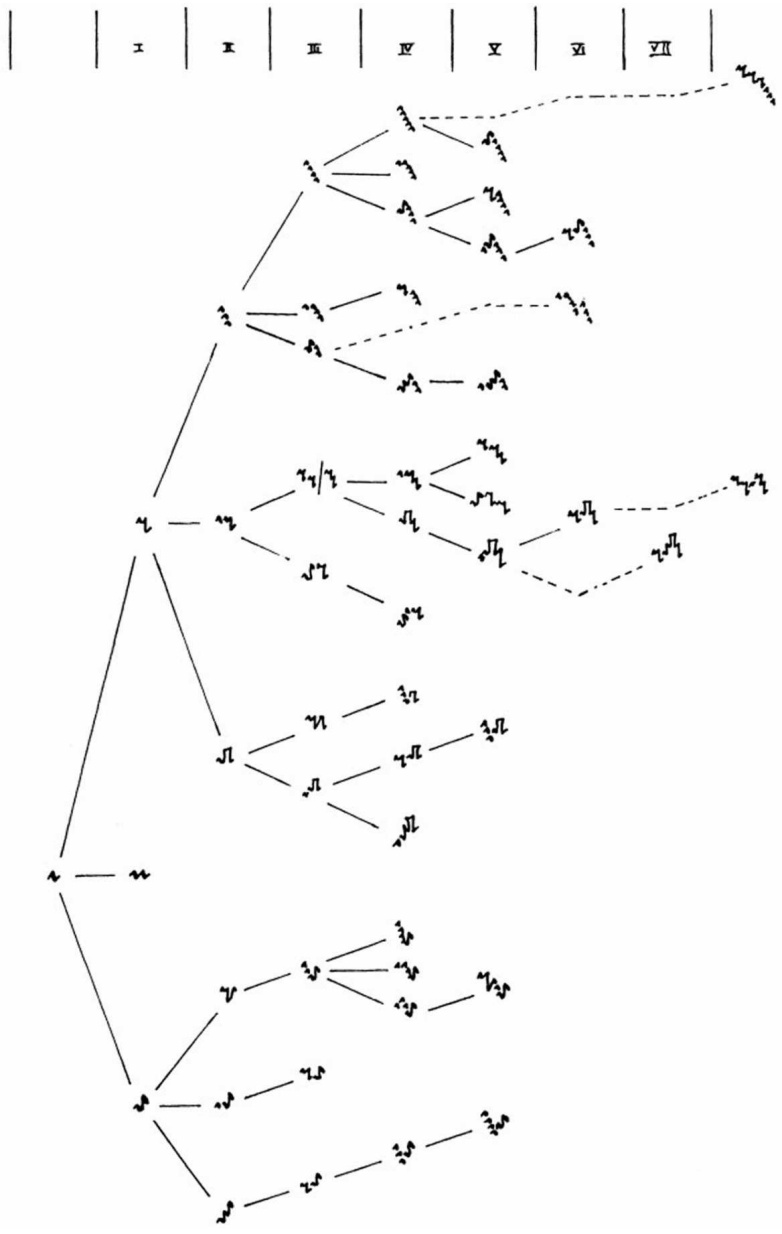


Fig. 9: The Sign Tree of the Chansonnier de Saint-Germain (prefix principle) [37]

3) Structural transcription as emended neutral transcription

To facilitate the discussion, I would first like to convert the Sign Tree into modern notation, and to present supporting arguments for this representation. If one uses the system of rules of the notators as a basis, we must differentiate between structural and secondary notes. This cannot be done in conventional neutral transcription: the latter represents a purely iconic interpretation, and does not take into account either the "tacitly understood final long value" or the symbolic function of the bipuncta. Example:

The clivis (short–long) would be transcribed "neutrally" as:

The pressus (long–long) would be transcribed "neutrally" as:

[40] In order to treat the structural notes, both tacitly understood and bipuncta, as equals, one would have to notate the final notes also as double note-heads (clivis: ; pressus:). In that case, however, there would be a discrepancy with single notes – which could be resolved only by notating these with double note-heads as well ( ).

Fig. 10: Comparison of Neutral and Structural Transcription (examples)

The solution can only exist in going back one step: structural notes should be transcribed, like the single notes, with the standard sign (stemless note-head), but we should find a "lighter" sign for the secondary notes. The most practically convenient figure has proved to be the void lozenge. I will call the system of transcription based on these two signs *Strukturtranskription* (structural transcription; Fig. 10).

[41] Structural transcription follows the pattern of the notators' conception and transmits in exact manner those two tacit understandings which – although originating already from a developed song and notation tradition – were treated *systematically* only by them: the final long value and bipunctum. If we are to transcribe this music at all, then we should also "convert" these two particularities.

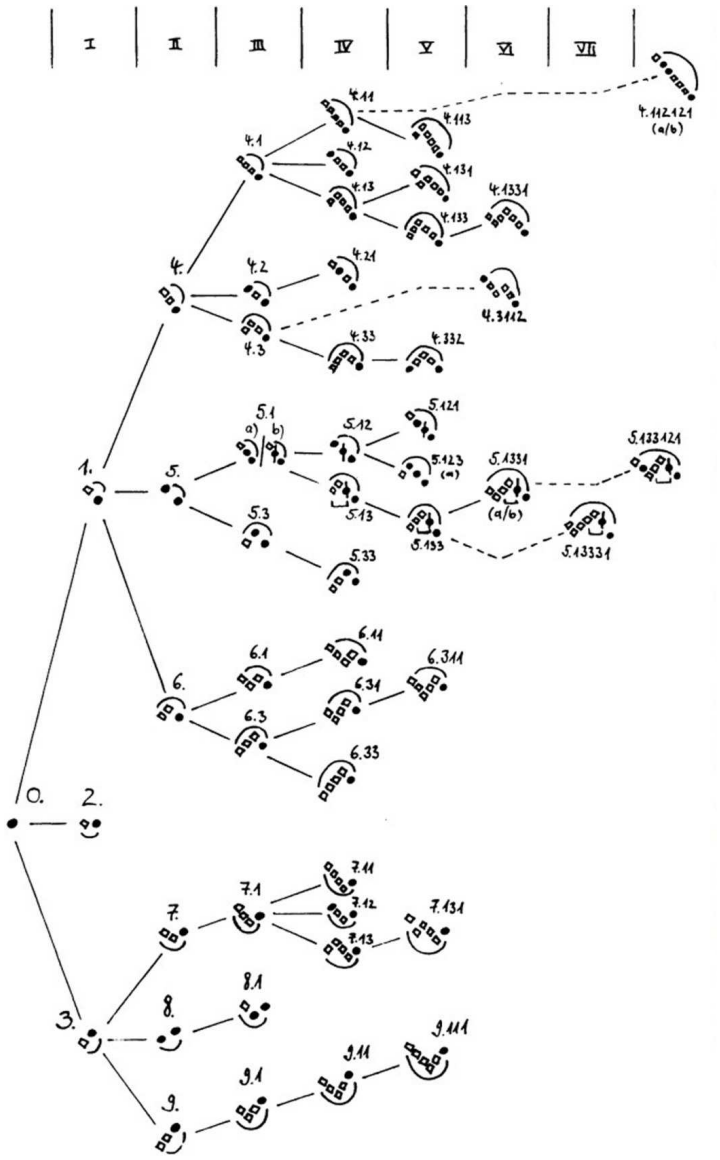


Fig. 11: Sign Tree of the Chansonnier de Saint-Germain
in structural transcription [43]

Neutral transcription, on the other hand, can only remain the emergency solution so long as all manuscripts have not been properly examined with regard to the sign systems they employ. But when it is argued, in favor of neutral transcription, that it represents nothing but a faithful quasi-facsimile, then this is not only unhelpful but actually inaccurate: for it is the ligature forms that "speak" most eloquently in the original that are levelled in the neutral picture. In this way erroneous modern associations may occur that are hard to avoid consciously.[36]

[36] Equalistic note durations, arbitrary melismatic freedom, repression of the final long value, excessive emphasis on bipuncta in relation to final and single notes [even though these have the same value].

The signs of structural transcription are unambiguously identifiable and have all the plasticity that is needed here. Yet since they still represent an abstraction – just as was the case with the original signs – it seems commendable to keep a certain "oral," indeterminate surrounding field in mind when working with it. The principle of the final long value, in particular, should not be understood too rigidly. For the determination of its relative weight it is important to consider whether the sign occurs on an accented or unaccented, short or long, syllable.[37] The same is true for the bipunctal structural notes. Similarly, not all ornamental notes are the same: notes that mark beginnings or turns in the ornamental motion will tend to sound more accented and aurally prominent than passing notes – a natural tonal "micro order" that needs not be laid down in the notation, since it will operate of its own accord in practice.

The question whether notators may have normalised what was originally a rich multiplicity of sounds is hard to answer with certainty. Every notational system imposes a grid upon the sounding reality that will tend to show up only select parameters and necessarily magnifies these. The system discussed here represents pitches and vocal ornaments. With regard to neither can we determine the possible loss of detail or the degree of normalisation. What needs to be kept in mind, however, is that the utmost care
[42] was lavished on the representation of ornaments; this must obviously be respected, in our scholarship as well as in practical performance.

The entire sign system of the Chansonnier de Saint-Germain is shown in structural transcription in Fig. 11.[38] The numerical classification employed here allows us to reconstruct every figure on the basis of its code, even without seeing the notation. The "numerical terminology," which can be derived equally well from a direct reconstruction of the logical and internally consistent writing system, might prove of future help in the scholarly discussion of neumes.[39]

[pp. 42–46 omitted from this translation]

[37] The three notes of the climacus, for example, could appear as rapid triplets on a short unaccented syllable, in which the first/highest note would sound most prominently. Yet this is not a matter of violating the principle, but rather of its practical dilution in a borderline area.

[38] Concerning such divergent graphics, liquenscences (a subsystem with an analogous "liquescence tree"), and others, see my edition; the latter also presents detailed analyses of all the signs, with suggestions for practical performance. – In the present connection I would only like to draw attention to the double form of the biclivis (5.1 a/b), a conscious differentiation of two clearly distinguished song figures, which present a singular exception to the otherwise well-observed principle of the unambiguousness of the positions. The practical relevance of the two figures was apparently so great that it was not feasible to systematize them in a unifying manner. I have marked the ligated b type, as well as its expansions, with a crossed-out head at the ligated place. More on this below, under Fig. 12/n.49.

[39] 0 means punctum, 1 through 9 the multiple-note "basic neumes" (for reasons of systematicity the bipunctum receives the number 2). The other numbers indicate, separated by full stops, the expansions of the "character neumes" 4 through 9; the principle of the basic sign 1 to 3 has been applied here in analogous fashion: after the full stop, 1 means a higher, 2 an equal, and 3 a lower prefix. The series of numbers read from left to right refers to the sign read from right to left.

The question whether the Sign Tree represents a system unique to the Chansonnier de Saint-Germain, or whether it formed the notational basis also of other contemporary manuscripts, must be answered in favor of the latter possibility. Everything indicates that this must have been "the" generally current manner of notation at least in the thirteenth century. On this point a survey of monody, plainchant, and polyphony may be in order. [46]

Let us begin with secular song. But for the one exception of the Chansonnier de Saint-Germain, all known troubadour/trouvère manuscripts are written in square notation. How compatible are Metz neumes and square neumes? By the late twelfth century, Metz notation was already in retreat vis-à-vis square notation, which came rapidly spreading from the West.[45] More and more scriptoria adopted the latter, with the result that the two notational dialects existed side by side for several decades. The exchange between scribal centers – and not least between the collectors of courtly song – required notations to be immediately translatable. In this connection the existence of "Metz polyphony" may not be without significance.[46]

Partial analyses and random samples in various manuscripts have indicated that the tell-tale clues to the Sign Tree can be frequently observed: bipuncta, but never final bipuncta; never tripuncta. A complete sign analysis of the Arsenal codex, the most comprehensive trouvère manuscript, whose reliability has made it the preferred source for scholarship in this area (Paris, BN, Bibliothèque de l'Arsenal 5198; siglum K), brought certainty in this regard.[47] It originated in the second half of the thirteenth century, and contains 482 tunes; its notation may count as typical of the premensural square notation of the trouvère manuscripts. [47]

The approximately 35,000 signs in K arrange themselves in a Sign Tree which bears close resemblance to that of Saint-Germain, not only in principle but also in its details. That there are some large ligatures, most of them occurring only once, that are found in either K or in Saint-Germain but not both, can be easily explained as due to differences of song repertory and of chronology, geographical location, and musical style; each manuscript, then, exhibits an "individual choice" from among the possible positions in the Sign Tree. The principles of ramification and sign construction in K, however, are completely identical to those of Saint-Germain; the graphic consistency of the sign endings in their various branches is maintained just as much in K as it is in Saint-Germain.

[45] J. Hourlier, *Le domaine de la notation messine*, in: Revue Grégorienne XXX, 1951, pp. 96–113 and 150–58.

[46] Six motets in Boulogne-sur-Mer, MS. 119, as well as the sequence *Verbum bonum et suave* in Douai, MSS 90 and 274.

[47] Facsimile: P. Aubry and A. Jeanroy, *Le Chansonnier de l'Arsenal*, Paris 1909 (with partial modal transcription by Aubry).

To enable direct comparison with Figures 9 and 11, I will not display here the individual Sign Tree for K, but rather that of Saint-Germain in the note shapes of K (Fig. 12).[48]

There is one detail that calls for comment. The graphic differentiation between the three-note ligatures and has so far been treated as inconsequential scribal variation – even though that differentiation testifies, to all appearances, to consistent use and principle-bound distinction. With the help of the Sign Tree it can be determined that must be understood as an abbreviated form of the biclivis (Sign 5.1 a/b). Here is how we may imagine the three signs to have sounded in music:

[49] It is the Metz manner of writing that puts us on the trail of this interpretation; once it is found, it acquires plausibility also for the more abstract square signs.[49] This important differentiation is sadly ignored in neutral transcriptions, at least in so far as they do not supply additional symbols of the original note shapes.

"Pre-modal" ligatures in the sense of the Sign Tree can also be found in the rare trouvère manuscripts and fragments of the later period that already apply "semi-mensural" notation, as for example the Chansonnier Cangé (Paris, BN fr. 846; siglum O). The ligature system remains traditional as long as it delimits itself to single notes with and without tail; special experimental signs may be added on occasion. It is only when – after the example of Franco – ligatures are adopted in the mensural structure that the Sign Tree becomes obsolete: bipuncta lose their function and disappear, to make way for ligatures "cum opposita proprietate," etc.[50]

[48] I have left open only the problematic combination 4.112121, which is found in only one song in Saint-Germain, and which evidently presented great difficulties of construction to the Metz notators. I hope to represent the Sign Tree of K in its concrete individuality on a future occasion.

[49] Cf. n. 38.

[50] The troubadour manuscript R (Paris BN fr. 22543) is notated in this way; whether it does so consistently, and with what specifics, remains to be established. An overview of the signs is provided by E. Aubrey in *A Study of the Origins, History, and Notation of the Troubadour Chansonnier Paris, Bibliothèque nationale, f.fr. 22543*, Diss., Univ. of Maryland 1982, pp. 134–36.

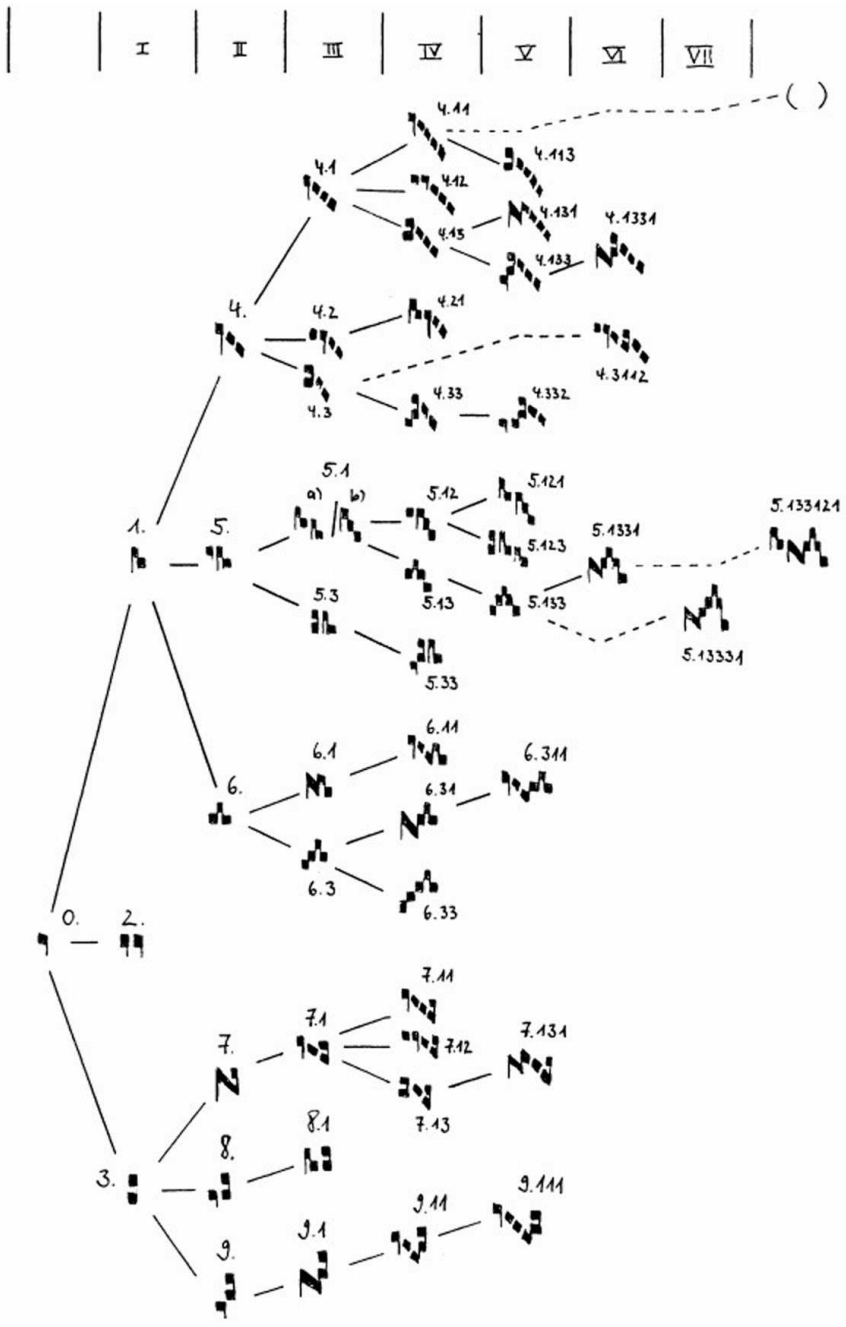


Fig. 12: The Sign Tree of the Chansonnier de Saint-Germain, transliterated in square notation (graphic shapes after K) [48]

The universality of the Sign Tree, across wide chronological and geographic distances, is confirmed by a surprising finding: the system is still used by the notators of the Jena Songbook (Jenaer Liederhandschrift), which originated around 1350 in the eastern part of Germany.[51] This is remarkable not only because of the distances of time and place, but also because this is the only known example of square notation in this area; the exemplars must have been written in German notation, allowing us to conclude that there was direct compatibility even with these.

The deciphering of the micro-rythmic system yields new perspectives for research into Minnesang and its performance. Even richly ornamented melodies now reveal their tonal structures:

[50]

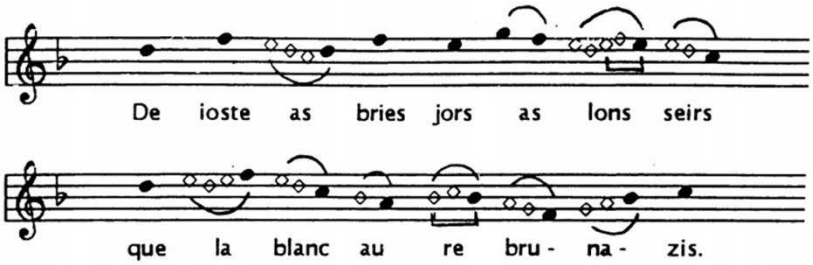


Fig. 13: Beginning of the chanson of Peire d'Alvergne (cf. Figs. 1 and 2) in the version of the Chansonnier de Saint-Germain (structural transcription)[52]

The structural notes provide a reliable basis for the performative elaboration of the songs, and may allow us to uncover the intricate structure of text declamation, macro rhythm and ornamentation.[53] Melodic analyses, so often based until now on (literally) "wayward" premises, could profit from this, too.

Yet structural transcription tells us nothing about syllable emphasis, metric patterns, and rhythmic measures – any more than does the original notation. These may not be elucidated until the second research stage. But the elucidation of this area (variable within stylistic boundaries) is at least no longer hampered by inadequate readings of the ligatures. The generally accepted axiom that ligatures would have expanded the value of a syllable falls away. In actual fact only a few large ligatures cause such expansion. About 95 % of all syllables are ornamented only lightly or not at all, and thus

[51] Comprehensive analysis shows that the chief notator (72 melodies) was most familiar with the system. The notator of the Wizlaw Corpus added later on (18 melodies) seems somewhat less confident in certain details; the notator of the second addition had even less experience, as far as one can tell from the one melody (fol. 55r-v). I will address the Sign Tree of J, too, on another occasion.

[52] The transcriptions in Fig. 2 present the versions of the Chansonnier R (cf. n.50), which originated *c.*1300 in southern France. R notates the melody a fifth lower than St.-Germain; otherwise the two versions are – notwithstanding the geographic distance and a chronological divide of two generations – remarkably similar, also with regard to ornamentation (the first syllable is unornamented in St.-Germain: significantly this happens to be the final note of the ligature in R).

[53] The microtonal differences in weight of the ornamental notes, discussed above in IV. 3 (n. 37), should be observed.

"indeterminate" with regard to their value, that is, they may appear in both long and short metric positions; only 5 % suggest greater length because of more elaborate ornamentation. Verse construction, therefore, is not hampered or disrupted by the music at all, but is evidently supported and structured along with it.

The results show that the melodies are not "melismatic," but – apart from singular large ligatures – syllabic, or "ornamental syllabic." With this insight it should be possible to rediscover the metric art of the troubadours and trouvères. The same is true of German Minnesang and the extensive Latin song repertoire. Questions raised in connection with modal conceptions will need to be taken up again, without settling for the older schematic [51] answers.[54] It is also important to take into account the new insights into oral declamatory practice, without setting out to derive from this a psalmodic "free declamatory" style. The starting points for new research are there; collaboration between philologists and musicologists would be desirable.[55] A solution to the "problem of rhythm" seems within reach.

I would like to touch only briefly on the questions that now pose themselves with regard to plainchant. Here, Gregorian semiology has already established the importance of ligature endings ("syllable articulation") for older notations, but no system has emerged so far from the complex neume repertoire.[56] When would the system of the Sign Tree have been developed and perfected – in the context of a rationalisation of neumatic notations? The Sign Tree, as it is found in "scholastically" perfect form in the chansonniers of the thirteenth century, could provide a helpful comparative yardstick for the elucidation of this transitional process.

For the assumption that perhaps we are dealing here with a system specifically for secular music can be safely ruled out. The notators of song manuscripts were clerics or had at least learned their craft in the church school. Are we to assume that the same ligatures would have denoted vocal ornaments in the secular sphere, but chains of notes in equalistic *cantus planus* in chant? Would the term *planus* (for example in Franco) not have applied sooner to unmeasured *notation* than to "plain" performance? Did a *cantus planus style* really originate as early as is now generally assumed? What regional time

[54] H. Tischler's catalog of arguments in favor of a metric-rhythmic reading should no longer be ignored, but critically discussed; the weakness of individual points does not invalidate the entire catalog (*The Performance of Medieval Songs*, in: Revue Belge de Musicologie XLIII, 1989, pp. 225–42). For the importance of accentual rhythm with simultaneous fluidity of rhythmic models and only subsequent determination in notation, see L. Treitler, *Regarding Meter and Rhythm in the Ars Antiqua*, MW LXV, 1979, pp. 524–58 (as well as Tischler, *A Propos Meter and Rhythm in the Ars Antiqua*, in: Journal of Music Theory XXVI, 1982, pp. 313–29). Cf. also the role of accentual-rhythmic articulation in song verses in the *Parisiana Poetria* of Johannes de Garlandia, to which M. E. Fassler draws attention in *Accent, Meter, and Rhythm in Medieval Treatises "De rithmis,"* The Journal of Musicology V (1987), pp. 180–90.

[55] A preliminary sketch towards a metric-declamatory conception can be found in my article *Singen auf dem Pferderücken. Indizien zur Rhythmik der Troubadours*, in: *Soziolinguistik und Sprachgeschichte – Querverbindungen. Brigitte Schlieben-Lange zum 50. Geburtstag*, Tübingen 1994, pp. 229–59.

[56] See n. 25.

shifts might we have to take into account? How could the system of the Sign Tree,
[52] whose principal aim was the differentiation of customary song figures, have been developed under the auspices of such a style? Would the troubadours, for example, who had sung "oral ornaments" throughout their lives, have had to relearn everything in old age, when they spent their last years in the monastery (as some Vidas report)? Would it not be more plausible to assume, with Wolf Frobenius, that "the conception of chant as a *cantus planus*, predominant since the late thirteenth century [! RL] ... is the counterpart to the theory of mensural music"?[57] Perhaps this might even be on the early side, if we take seriously what Johannes de Grocheo reports; around 1300 he does not at all describe a "plain" liturgical performance practice current in progressive Paris, the center of mensural experiments: the Kyrie eleison was apparently sung after the manner of the *simplex cantilena*, the Responsory and Alleluia in the manner of the *stantipes* or *cantus coronatus*, etc.[58]

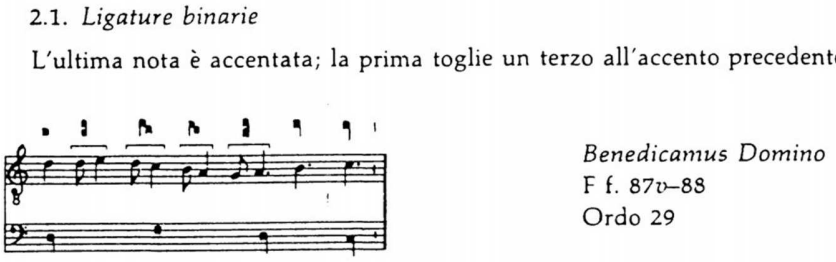
On the other hand we are familiar with the phenomenon of the "defunctionalization" of the ornament; we encounter it already in the melismas that Notker supplied, note for note, with text, and converted into sequences. In the same way, clausulas later became motets, and the segments of chant melismas function entirely as freely disposable musical material, which serve the motets as tenors in any old rhythm. All this concerns the realm of written composition; of course, we cannot conclude from this that an oral ornamental practice could not have existed at the same time. What is instrumentally performed in this way are significantly mostly long, strange, or no longer fashionable melismas, not the characteristic vocal figures of the dimension of the syllable, as they are found in the songs of the chansonniers. We will have to keep both strands in mind, oral as well as defunctionalised ornamental practices, and will have to demonstrate where, how long, and in which pieces of the repertoire the practice of plainchant would have interpreted the notations handed down in the sense of ornamental practice.

Finally: polyphony and modal notation. On this topic there have been three studies in recent years that occupy themselves, from different angles, with the final weighting of ligatures; they invite an unavoidably brief discussion from the perspective of the system of the Sign Tree. In 1989, Luigi Lera examined the connections between premodal and
[53] modal ligatures, and attempted to establish a "grammar of Notre Dame notation." In 1990, Christian Kaden arrived at the thesis, based on the final weightings of modal ligatures, that there is a decisive "gothic" innovation in the "vectoriality" of Notre Dame rhythms. In 1992, Theodore Karp presented analyses in his edition of the polyphonic St Martial repertoire which showed that there is significant correlation between consonant sonorities and the final notes of ligatures.

[57] Article "Longa-brevis" in: *Handwörterbuch der musikalischen Terminologie*, Wiesbaden 1973.

[58] E. Rohloff, ed., *Die Quellenhandschriften zum Musiktraktat des Johannes de Grocheio*, Leipzig, no date (conclusion of treatise).

Luigi Lera's work[59] is based on the insights of Gregorian semiology. Proceeding from those insights, he arrives at the conclusion "that the concept of neumatic final-note articulation does appear to be capable of carrying the whole edifice of Notre Dame notation on its own."[60] Lera suspects that the flexible concept of syllable articulation was lost already by the time of the development of the motet, and made way for a rough reinterpretation: henceforth the final note of every ligature was only *accentuated*.[61] On this basis he proposes a modal-rhythmic system of two-note ligatures, three-note ligatures, and so on (Example: Fig. 14).

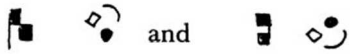

2.1. *Ligature binarie*

L'ultima nota è accentata; la prima toglie un terzo all'accento precedente.

Benedicamus Domino
F f. 87*v*–88
Ordo 29

Fig. 14: Lera, page 157

Lera's work is greatly to be credited for its insistence on the immediate connection between the "rhythm-less" ligature and its graphically identical modal descendant, where the long values and emphasis of the final note have never been in doubt. But doubt may be in order with regard to some essential points. In the first place we are not dealing with a situation where the modal ligature cleanly succeeded the pre-modal one, but rather one [54]
in which they coexisted for a long time. This is apparent not only from the song manuscripts, which used the system of the Sign Tree until into the fourteenth century[62] – but in the Notre Dame manuscripts themselves, sometimes even within one and the same piece, "premodal" and modal notation are used; more on this shortly. The compatibility of the two is easy to understand from the perspective of the system of the Sign Tree: the following signs"



mean in "premodal" terms, without specificity, "secondary note plus structural note" (= short appoggiatura before the structural note).[63] Concretely this may mean: a) "short plus

[59] *Grammatica della notazione di Notre-Dame*, in: AcM LXI (1989), pp. 150–74. He is careful to characterize his results as "forzatamente provvisorie" (p. 174).

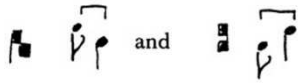
[60] Page 174, translation RL [RW].

[61] Page 157, 156.

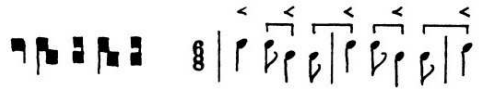
[62] The trouvère manuscripts M and T even contain motet appendices (with modally notated tenors).

[63] Apparently this was the original meaning of *proprietas* and *perfectio*; for the terminology (proprietas as that which is owned, not what is characteristic) cf. C II 6 of my edition of the Chansonnier de Saint-Germain.

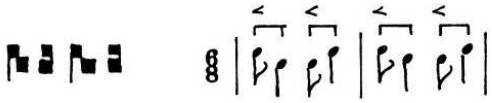
long" (unproportionally) or b) "unstressed plus stressed note," or both. But then this open micro-rhythmic principle is being spread out – in passages *sine littera* – to the level of the macro ("beat") rhythm, subjected to a durational pattern and reinterpreted as "brevis plus longa" in the ratio 1:2.



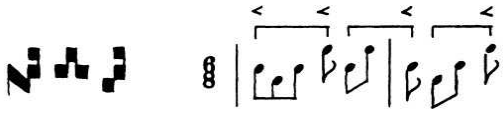
The graphic shape of the signs remains the same in both "temporal dimensions." The two original meanings of the structural note are also adopted in the modal broadening. The first mode uses both meanings, long duration and stress:



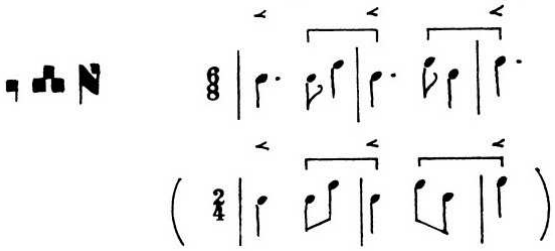
Other modes use only one of the two meanings, thus the second mode only the long value:



[55] The sixth mode uses only the stress, not the long value:



The three-note ligatures in the third mode, too, betray their immediate origin in the system of the Sign Tree. The model  () is defined in proportional terms as brevis-brevis-longa; the structural note retains both its long value and its stress, which now carries the measure accent:



In every case we are dealing with an originally unmeasured model, limited to the level of syllables, that is transferred, by means of a proportional grid, to the "level of beats" and thus with the uniform and objective articulation of the progression of time.[64] The modal

[64] Departures from the model of the structural note (initial long values in three-note and four-note ligatures) can be observed at the beginnings and after rests. They serve to make the mode distinguishable and may have been introduced in a more advanced stage of development. The model, I suspect, could once again have been provided by everyday practice: the "natural" lengthening of the initial note for the coordination of singers (tuning). F. Ludwig already regarded this rhythmic departure as "something artfully laid down as fixed and yet retractable at the same time," that would have been added at a later stage (*Repertorium organorum recentioris et motetorum vetustissimi stili*, t. I/1, Halle 1910, pp. 47–48,

broadening of dimension is evidently to be understood – without denying its far-reaching consequences – as an exceptional additional indication for the otherwise fundamentally "normal" square notation: an indication that applied only to particular passages or voices *sine littera*. [56]

In the literature on modal notation, this Janus-face quality is mostly treated in oddly veiled fashion. It has long been known, for example, that one gains nothing from modal ligature meanings in conducti. Although scholars like to transcribe texted ligatures by "modal analogy" (= , with longs at the end),[65] no-one makes the effort to apply them in way to articulate measures, as is characteristic of modal ligatures; that would obviously make no sense. Conductus rhythm cannot be derived from the ligature, but rather – just as in the case of courtly song – from the poetic meter. The Notre Dame manuscript F (Pluteus), which originated at around the same time as the Chansonnier de Saint-Germain (or at most a decade later) contains, significantly, three Latin parallel versions of melodies of the chansonnier – one monodic and two in three parts. Corresponding contrafacts exist for the melodies of other chansonniers. If one studies the sign repertory of the monophonic and polyphonic conducti in F, it quickly becomes clear that the system of the Sign Tree, including the typical occurrence of bipuncta (which have no function in modal signification, and thus drop out),[66] has been applied there. The graphic shapes in F match those of the trouvère manuscript K very closely (cf. Fig. 12).

Lera's Notre Dame examples are almost exclusively taken from passages or voices *sine littera*. Does he want to delimit his notational grammar to these or does he also mean to include texted passages? The distinction is not explicitly discussed; but one suspects from a small example with syllabic text placement (p. 169) that Lera wants to apply the modal-proportional ligature interpretation in general. The aporias that would result from this are left undiscussed.

[57] Such aporias become especially obvious in motets. Here, the tenors are notated modally, but the upper voices in normal square notation without modal indication. The

43, 45). Ludwig's famous digression impresses even today for the unsurpassed clarity with which the principles of modal notation are described (pp. 42–54). In the light precisely of the system of the Sign Tree, his discussions do retain their full validity, even in details: it was established correctly, for example, that three-note groups are notated as two-note ligatures with plica when the final note is unaccented (p. 46) – once again involving a grid projection onto the Sign Tree model. The only corrigendum in Ludwig's explanation concerns his evaluation of "premodal" notation, and even here his *Formulierungen* are scarcely debatable. When he writes that "primitive square notation [...] did not even involve an awareness of the formal distinction between long and short notes" (p. 50), then this is inaccurate only for bipuncta; the long value of the final note is in fact expressed, not in a formal distinction but an interpretive one. Finally, the comment "Two-note ligatures were always given the meaning: short-long" (p. 44) needs to be replaced only by "One adopted now with the ..."; in every other respect, Ludwig's discussions are so spot-on that it seems almost as if he had known the model of the Sign Tree.

[65] The transcriptions of the two-note ligatures, on the other hand, are mostly rhythmically inconsistent.

[66] The only "unsystematic" sign variants – according to my analyses so far – concern the occasional thickening of squares (elongations): in relation to the punctum, whose lightly and heavily elongated shapes (the latter: maxima); in relation to the pes the variant with elongation of the lower note, which is mentioned also in the *Discantus positio vulgaris* (Cserba, p. 190) and which confirms the length of the final note in the pes.

rhythmicization of the upper voices is determined by fitting the sounds and syllables to the tenor, definitely not by interpreting the ligatures on each syllable in a modal sense. Since the overall rhythms seem to order themselves effortlessly into "modal" 3/8 groups, there has been little reason so far to point out the two quite different worlds to which the graphically identical ligatures belong. This has led to a paradoxical practical consequence for several decades: in customary transcriptions it is only in the tenor that the principle of final accentuation – highlighted by Lera – is realized, whereas the texted ligatures retain the rhythmic accent consistently on their initial notes (Fig. 15).

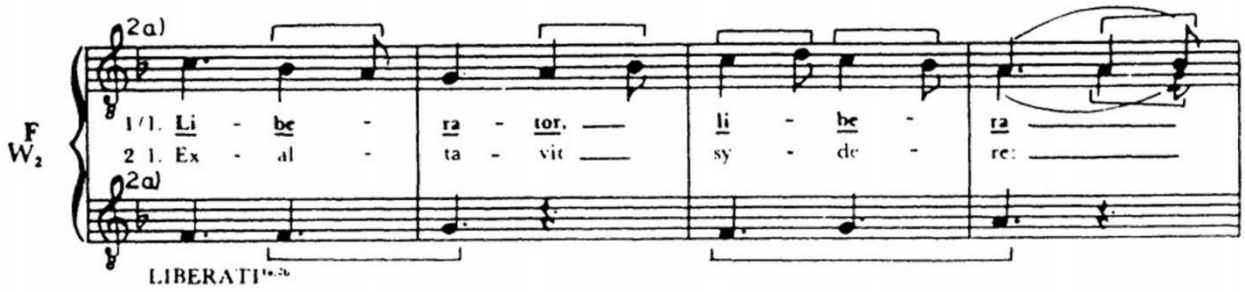


Fig. 15: Generally current double ligature interpretation in motets: F, fol. 414r (Tischler)[67] [57]

An odd contradiction: the accent is supposed, in the modal reinterpretation of the ligatures, to have suddenly jumped to the end? The system of the sign tree shows that the weighting of the final note is certainly not a modal invention; the weak point in received conceptions, then, seems to lie rather in the strict accentuation of the beginning of the texted ligatures.

We cannot offer here an easy and general solution; yet it would be worth establishing what would be the result if we interpreted the texted passages in the sense of the Sign Tree, that is, with an understanding of the ligatures *cum littera* as vocal figures that have ornamental prefixes. The relevant criterion could be the technique of harmonization. Conventional transcriptions bewilder again and again with the multiplicity of dissonances on downbeats (Fig. 16a).

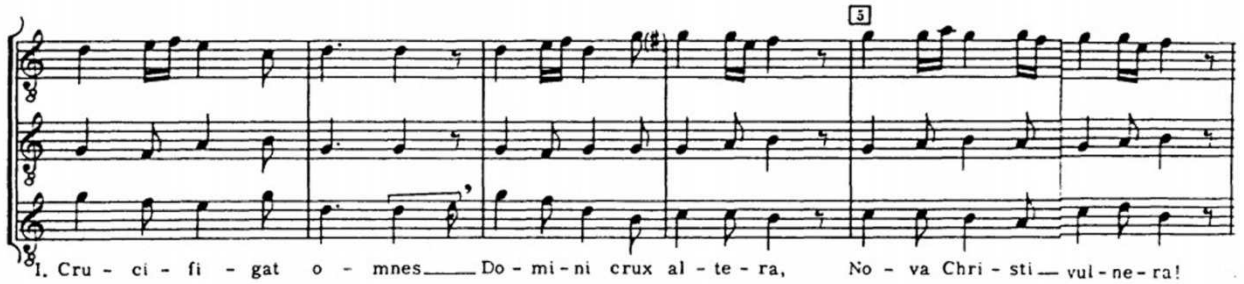


Fig. 16a: W_1, fol. 78v (Anderson)[68] [58]

[67] From: H. Tischler, *The Earliest Motets*, Yale University Press 1982, vol. 1, p. 548.

[68] From: G. A. Anderson, *Notre-Dame and Related Conductus, Opera Omnia*, Institute of Mediaeval Music 1979ff, Part 1, p. 106/7. The version in F differs from that in W_1 only on the syllables "-ni crux" in the lower part (Fig. 16b).

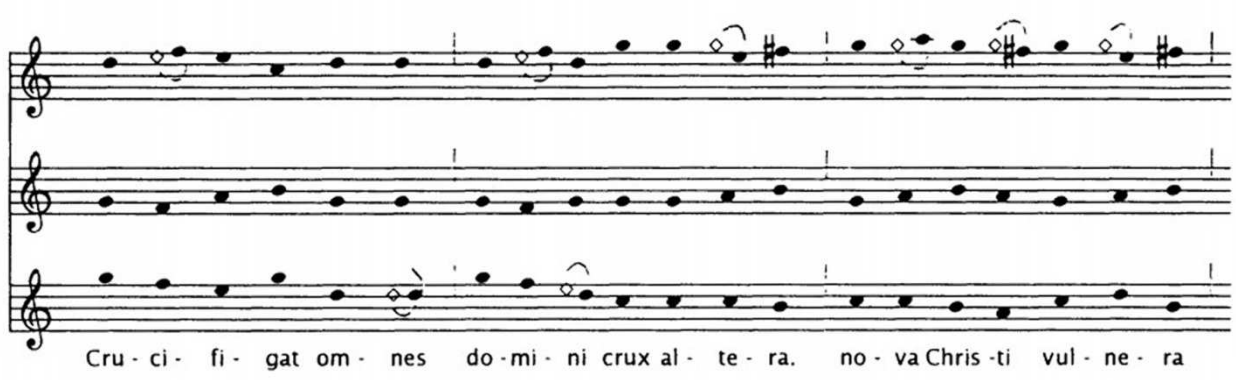


Fig. 16b: F, fol. 231v (structural transcription) [58]

[58]

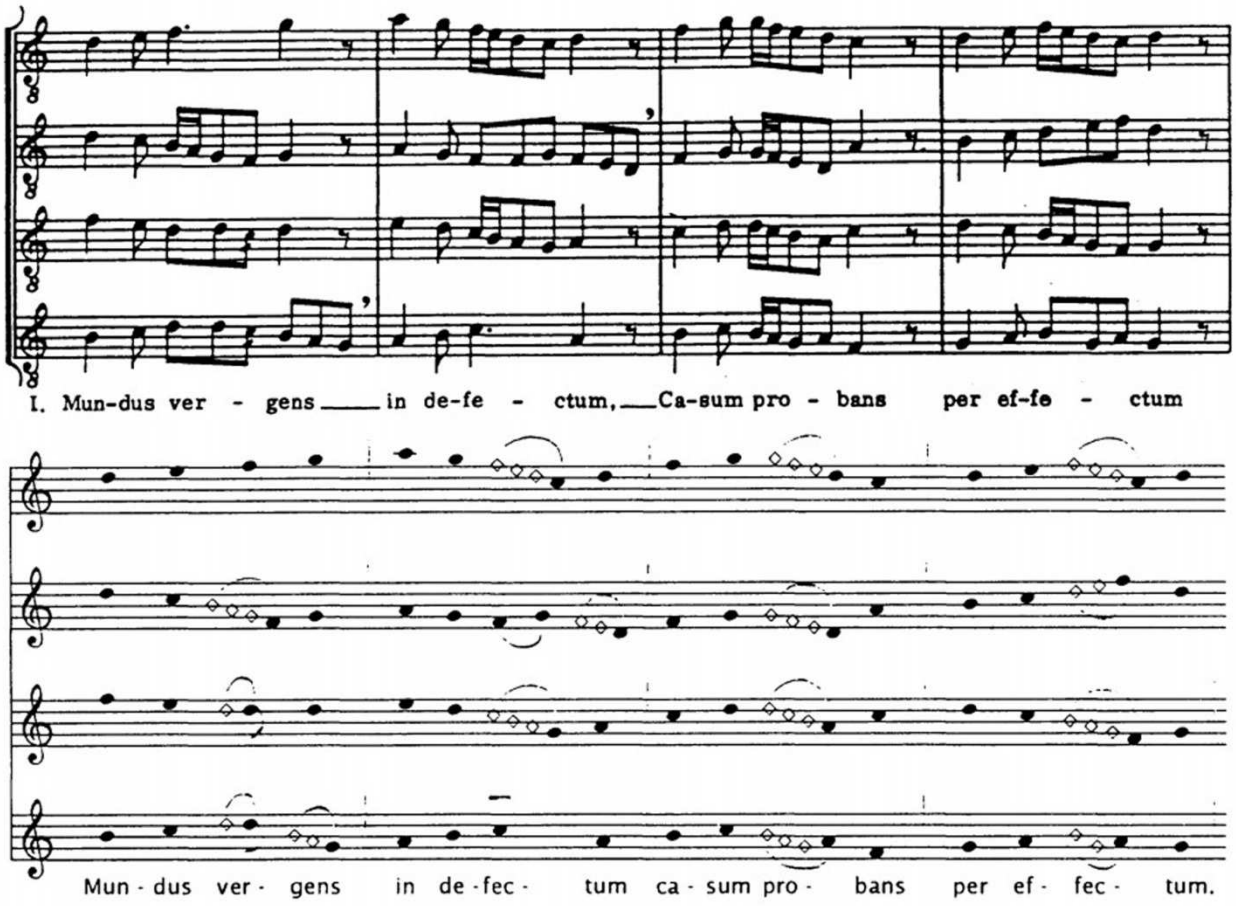


Fig. 17: F, fol. 9r in modal transcription (Anderson) and structural transcription[69] [59]

The conductus example shows that the clivis ligatures here are evidently to be understood as ornamentations: short appoggiaturas before the chief note. It should be noted that in the ornamental conception the question of stress remains open: the system of

[69] Anderson, *loc. cit.*, p. 40. In the lower voice-part the punctum on "-fec-" shows the slightly thickened shape (cf. n. 66) which corresponds to the bipunctal pes in the triplum.

the Sign Tree does not define whether the appoggiaturas are stressed or unstressed. This allows singers the freedom of a flexible alignment of the micro-rhythmic figures. Neither is it the task of performers to concern themselves with the tempo of the ornamental notes – since the notation does not imply proportional durations. In any event, the harmonic structure will, in the case of ornamental interpretation, take concrete shape (Fig. 17).

Yet how do we explain the cases, also existing in the Notre Dame repertory, in which it is dissonances that appear on the final notes? The question is partly resolved by the possibility, intrinsic in the notation, of rendering ornamental notes with stress and final
[59] notes without stress. What complicates the sitaution for us is the fact that undoubtedly composers often wrote dissonances intentionally, even on downbeats. The question which sounds were truly intended and which appear to us as dissonant only because of faulty transcriptions, can hardly be ascertained for now; because of the uncertainties with regard to micro and macro rhythm we are still a long way from understanding the harmonic techniques and the aesthetic of the Notre Dame period.

Yet I do not want just to explain away the occurrence of final-note dissonances. It is quite conceivable that – despite the traditional notation – the ornamental principle was observed more in some pieces and less in others. I have already pointed above to a
[60] centuries-long parallel trend towards the defunctionalisation of ornaments. Through attentive analysis one could possibly distinguish different parallel layers. In view of the advanced scriptuality [*Schriftlichkeit*] of the polyphonic centers[70] it cannot be ruled out that the ornamental conception – on the grounds of voice coordination and in the wake of the modal-rhythmic shift of dimension – already underwent modification among certain circles of musicians. Yet the opinion of Lera, that the pre-modal meanings of the ligatures had already been forgotten by this time, must be decidedly countered; we should reckon with the beginnings of a process, in the course of which local practice releases itself partially from the principles which still form the basis of the notation. One could extrapolate the model: the softening of the system of the Sign Tree, which occurred in the experimental kitchen of polyphony, could then be pinpointed as the concrete cause for the situation which prepared the ground for mensural notation.[71]

To elucidate these connections, intensive enquiries into the harmonic techniques of the Notre Dame period will be necessary. A number of statistical materials have recently been published by Christian Kaden.[72] We are not concerned here with a discussion of

[70] The geographic diffusion of such centers is made plausible by H. van der Werf in his article *Anonymous IV as Chronicler*, Rochester, New York, 1990; in van der Werf it is the comparison of variants that suggests a differentiation of source layers.

[71] In view of the increasing uncertainties and optional choices, younger composers must have welcomed the new mensural lack of ambiguity – despite all the constriction and fixation within rhythmic grids that older musicians would understandably have experienced as delimiting, and whose ligature shapes they branded as "unnatural" (Jacques de Liège, *Speculum musicae*, CS II, p. 417b).

[72] *Modalrhythmus und "Konkordanzperspektive". Soziale Strukturen in der Polyphonie der Notre-Dame-Epoche*, in Musiktheorie V, 1990, pp. 221–235. Expanded version: *Gotische Musik. Polyphonie und Baukunst um 1200 als Paradigmen sozialer Orientierung*, in C. Kaden, *Des Lebens wilder Kreis. Musik im Zivilationsprozeß*, Basel etc. 1993, pp. 104–39. The page numbers cited in what follows refer to the latter version.

Kaden's exciting and far-reaching (if at times not convincingly motivated) theses on the relations between music and social history. I will limit myself to his statements regarding the harmonic "consonance perspective" [*Konkordanzperspektive*] and the relation between premodal and modal ligatures.

Kaden's attempt (p. 137) to identify the Gothic period as a "time of progress" ("from 1200 onwards one lives with time's arrow," ibid.) is based on the analysis of sonority progressions in polyphony. He examines which sonorities are found at the beginnings and endings of ligatures, and this according to a simple progressive scheme: dissonance < third < fourth, fifth < octave, unison (p. 123). For the discant parts of the Magnus Liber [61]
he arrives at the conclusion that "almost two out of every three ligatures are arranged 'towards a better ending'" (pp. 125/6).

This is not the place to discuss whether the proposed scheme of "harmonic increase" (p. 124) is really a reliable tool to demonstrate "the heightening of sonority itself" (p. 127).[73] Yet the result does seem to confirm the thesis of the final weight of the ligatures. Yet the parts of the repertory that were examined concerned music *sine littera*, and hence ligatures with a concrete modal additional indication; their final accentuations and lengths are in any case not under contention, for which reason the consonance finding does not come as a total surprise. Notre Dame parts *sine littera*, on the other hand, are not taken into account; the difference between them is not even discussed explicitly.

More interesting, in the present context, are Kaden's statistics regarding early polyphony before Notre Dame (Musica enchiriadis, Saint Martial, Chartres, etc., pp. 129–33). The musical examples show that here, too, it was only the texted passages that were studied. For our question, whether consonances are found *at all* in significant numbers at the endings of ligatures, the statistics have to be interpreted slightly differently.[74] For all repertories the result is that consonant ligature endings represent the normal case with about 85–95 %, and that dissonances are the exception. This allows us to perceive – by analogy to the chant studies of semiologists – the early transregional existence of the principle of the final note, and encourages enquiries into the preliminary stages and concretisations of the system of the Sign Tree in the notation of older polyphony.

Is the "moment of vectoriality" (p. 119), in the directionality of ligature endings, therefore really the invention only of the Gothic period? Kaden himself expresses doubt (p. 128). His comparison between older polyphony and the polyphony of Notre Dame must be weighted already towards a "consonance increase" in order to support the novelty thesis to some degree; the heterogeneity of the repertorial parts (*sine* and *cum*

[62] [73] Heightened effects, after all, can also be achieved through progressions towards "less" consonance or dissonance.

[74] The percentages in Kaden's column for consonance increase (<)indicate for the most part consonances on ligature endings. In the column for consonance decrease (>) there is a great number of cases to be in which the ligature ending shows only a "lesser consonance." The third column, which shows unchanging consonance (=) confirms the final consonance rule. Unfortunately once cannot obtain exact numbers from this, since the composite "melismatic" neume groups would require a methodology of their own. The significant frequency of final consonances is however quite evident. Even more exact results, in this regard, are obtained in the St Martial analyses of Th. Karp; more on this shortly.

littera) prompts additional reservations. Even less convincing are Kaden's reflections on the origins of ligatures. His dependence on Riemann and on Gregorian semiology (ibid. and p. 119) seems rather to prove the contrary of his thesis, just as the – justifiable – conclusion, made with an appeal to Luigi Lera: "rhythmic ligations meet a legacy from a problematic tradition, the legacy of the older group neumes" (p. 115). In response to the question what would have changed about the ligatures one finds only the erroneous comment that modal two-note ligatures apparently showed, "but now in contradistinction to their neumatic predecessors," predominantly the reading short-long; for this, Kaden is forced to refer to the outdated position of Solange Corbin, as yet uninfluenced by the semiologic approach (p. 117).

In order, then, to elaborate "the novel" in the Notre Dame school, one would need more precise methods. It does seem entirely conceivable that around 1200 there was a *new dimension* of compositional "goal-directedness" that manifested itself. But for now elementary questions of notation await a resolution, and further-reaching hypotheses should have to orient themselves on a sonorous picture in performance practice that does justice to new rhythmic/harmonic conclusions. Consonance analyses would be urgently needed, especially in the texted parts of the repertory.

While this is still pending for Notre Dame, and Kaden's analyses allow only an approximate estimation for the older repertoire, we do now have exact statistics for the St Martial compositions. These indicate that the ornamental ligature principle carried the distinction of a self-evident fundamental law in the polyphony of the twelfth century, and may even have been observed more strictly in contemporary practice than later in the Notre Dame environment. In his edition of the complete polyphonic corpus of St Martial, Theodore Karp has elevated the final accentuation of ligatures to a principle, thereby arriving at somewhat idiosyncratic transcriptions.[75]

The point of departure for his reflections is the observation that one obtains a multiplicity of consonances if one aligns the final notes of ligatures (rather than the first notes, as had been customary); this is documented with extensive tables.[76] Karp's
[63] statistics offer a precise juxtaposition of all sonorities that arise from the beginning and final note conceptions. The results surpass all expectations: when one applies the final note conception, 94.03 % of sonorities are consonant, against 5.97 % dissonant sonorities (total average).[77]

[75] *The Polyphony of Saint Martial and Santiago de Compostela*, 2 vols., Oxford University Press 1992. The fundamental thesis can be found already in earlier studies by Karp: *St. Martial and Santiago de Compostela: an analytical speculation*, in AcM XXXIX, 1967, pp. 144–60, as well as *Text underlay and rhythmic interpretation of 12th c. polyphony*, in IGMW, Report of the eleventh Congress (Copenhagen 1972), Copenhagen 1974, vol. 1, pp. 482–86.

[76] Vol. 1, pp. 11–23, with Appendix A, pp. 199–206. Incidental observations of this kind already led H. Husmann, in 1953, to the decision to base St Martial transcriptions emphatically on final consonances: Artikel *Cantus firmus* in MGG, vol. 2, col. 788.

[77] Summary of statistics 1, 2, 4, 5: RL. With the initial note conception one would obtain a ratio of 73.09 % consonances against 26.91 % dissonances. The figures for the final note conception correspond very closely to those obtained from a comparison of single notes (Karp's Table 3): 95.78 % consonances against 4.22 % dissonances.

Unfortunately, Karp's conclusions from this promising start do raise questions: when he interprets the strings of notes immediately in 3/8 groups, then this is a projection which is not suggested at all by the notation itself. To what kinds of aporias this leads becomes apparent when Karp is forced, as a further consequence, to separate and split up the text radically from the ligatures (Fig. 18 a/b).[78]

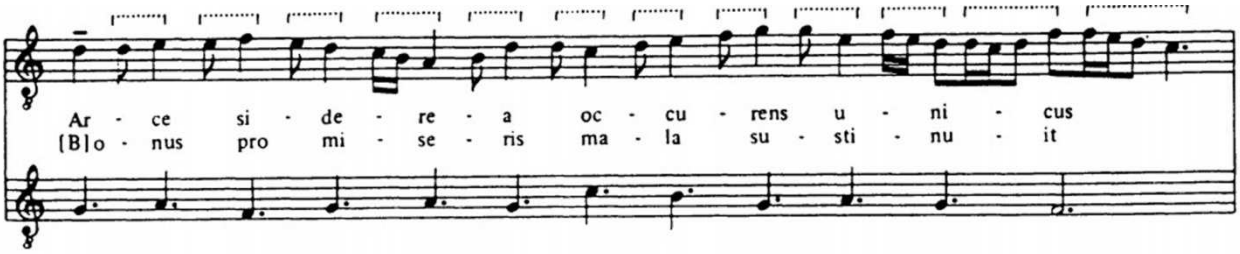


Fig. 18a: Paris, BN lat. 3549, fol. 156r (Karp) [63]

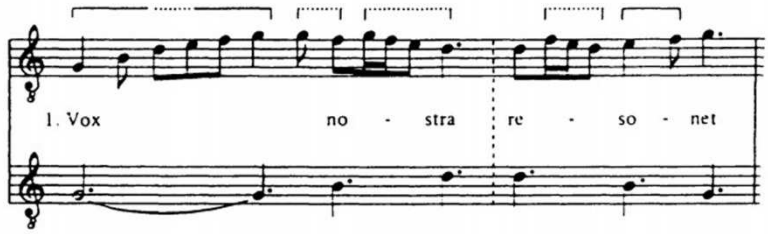
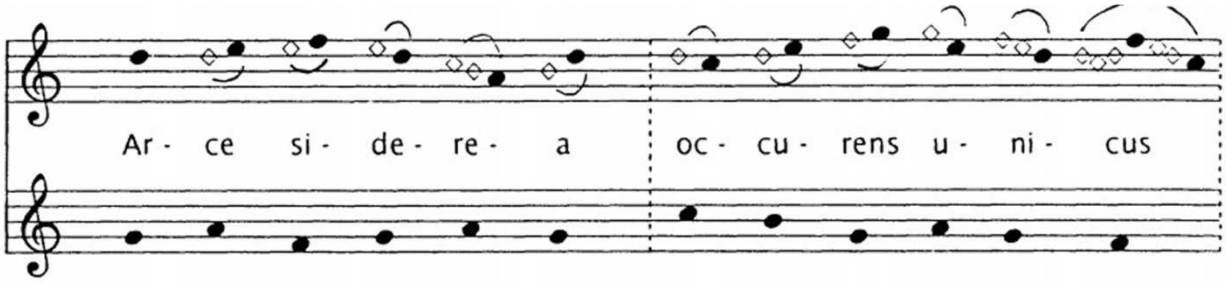


Fig. 18b: Codex Calixtinus, fol. 187v (Karp) [63]

Once again it would be worth interpreting the ligatures according to the ornamental principles of the Sign Tree. Instead of modal 3/8 groups we arrive at a decorative syllabicism, whose macro-rhythm is to be conveyed in relation to the meter. Yet as long as the sign repertory of the notators has not been consistently analysed, the tentative transcriptions in Fig. 19 a/b must remain unconfirmed. [64]



[78] Vol. 2, pp. 24, 213.

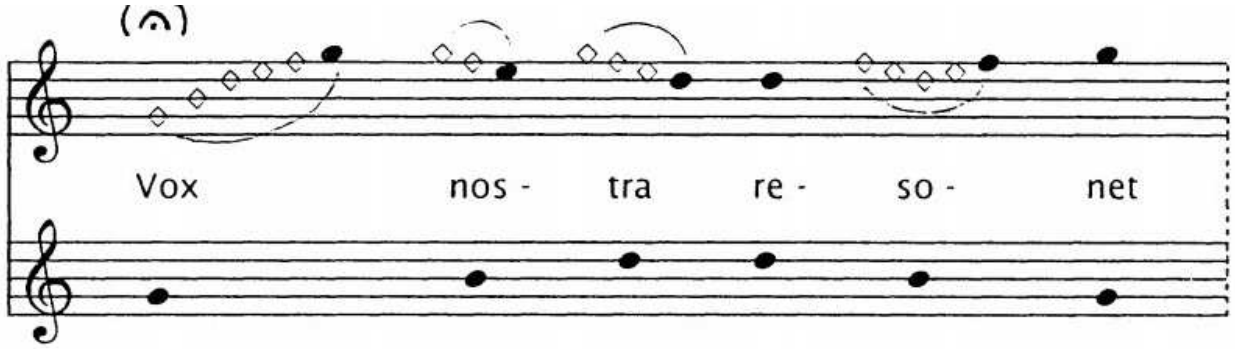


Fig. 19 a/b: Structural transcription[79] [64]

If the ligatures are understood as quick movements in the sense of oral song styles, then there will be no need for interventions in the relationship between text and music. Details of ornamental coordination are left to singers. These details also include the "question of the upbeat" (ornamental notes before or together with the parallel single note of the other voice? In the latter case, both before or on the "beat"?). This becomes a problem only in music notation structured in measures; oral song practice tends to shape such cases in a more flexible way.[80]

[65] While Karp's rhythmic-textual conclusions fail to persuade, then, his harmonic analyses have yielded material that underlines the structural function of the final ligature notes in impressive fashion. Yet without an understanding of the oral ornamentation practice, the principle of the final note may lead to distorted results, as Karp's theory shows.

The wide area of the notational developments before and parallel with the innovations of objective-proportional time measurement remains a *terra incognita* for now, for whose exploration we should undertake sign analyses of single manuscripts and their respective notators. It is only on the basis of such analyses that reliable and informative transcriptions seem possible to begin with. The system of the Sign Tree, as it has emerged in the Chansonnier de Saint-Germain-des-Prés, could serve as a secured bridge head for future research expeditions, and contribute above all to the recovery of the sound world of the music from this period.

[79] In ex. b there is a climacus (typical writing) on "nos-," not a clivis. Cf. P. Wagner's transcription in *Die Gesänge der Jakobsliturgie zu Santiago de Compostela*, Freiburg 1931, p. 116.

[80] The edition of H. van der Werf (*The Oldest Extant Part Music And The Origin of Western Polyphony*, 2 vols., Rochester, New York 1993) seems in this regard more helpful than Karp's St Martial edition. Although the personal aesthetic conception of the author is far removed from an oral ornamental practice (see the suggestions for performance in vol. 2, p. XXII), his neutral transcriptions do allow one to read the final note principle into them; yet the facsimile remains indispensible. Questions of voice coordination can be studied profitably in the well-known traditions of Georgian or Corsican polyphony, however one chooses to value their historical relevance (on the state of research, see S. Ziegler and A. Traub, *Mittelalterliche und kaukasische Mehrstimmigkeit. Neue Überlegungen zu einem alten Thema*, in Beiträge zur Musikwissenschaft XXXII, 1990, pp. 214–27).