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Medieval Ornamentation

"Ornamental" Neumes and Early Notation*

Timothy J. McGee

Musical ornamentation is usually understood to be the more or less spontaneous addition of unwritten elements to a composition. In some traditions the locations for the ornaments are indicated by composer or editor, and in others the performer is left to add them according to tradition and learned convention, but in either case a distinction is usually made between basic melodic material and the ornamental additions. Such a separation is not so easily made with reference to music of the Middle Ages. There did exist in the earliest medieval notation a set of neumes that in modern literature are often referred to as "ornamental," but this is incorrect terminology. To use the word "ornamental" in reference to early neumes is to project onto them a modern perception of their place and function; the medieval musician would not have thought of them as different from any other neume. As David Hiley observed, far from being "added on" to the music, "[the ornamental neumes] are fully

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integrated into the notation of the earliest sources.”¹ In fact, we shall see that what in modern terms might be referred to as “ornamental” was simply the only way of performing certain melodic gestures; the sounds they represented were part of the structure, not an ornament on something more basic.

Theoretical treatises from the late Middle Ages contain information concerning how some neumes were to be executed, indicating performance practices that in some cases are quite different from assumptions made in previous investigations of the subject.² As described in the treatises, the types of sounds required for the “ornamental” neumes suggest a vocal style quite different from the “bel canto” of later centuries. A comparison of these performance instructions with the early written forms of the neumes demonstrates that the neume shape itself was intended to represent the performance practice. Performance information was contained both in the particular shapes of the individual marks that were the components of each neume (straight, curved, etc.) and in their assembly (ligated or detached). A systematic study of this graphic relationship between the shapes of the “ornamental” neumes and the intended performance practice leads to a clearer understanding of the purpose and intention of the forms of early notation.³

¹ David Hiley, *Western Plainchant: a Handbook* (Oxford: Oxford University Press, 1993), 361.

² Over the past century there has been much speculation about the performance of chant including interpretation of the ornamental neumes. The basic literature includes André Mocquereau, *Le nombre musical grégorien*, 2 vols. (Rome, Tournai, 1908, 1927); Gregory Murray, *Gregorian Chant according to the Manuscripts* (London: L. J. Cary, 1963); and Solange Corbin, *Die Neumen*, *Palaeographie der Musik* 1/iii (Cologne: Volk-Verlag, 1977). Summaries of the various theories can be found in Willi Apel, *Gregorian Chant* (Bloomington: Indiana University Press, 1958), ch. 2, and Hiley, *Plainchant*, ch. 4. More recent work along the lines of the present essay can be found in Lance W. Brunner, “The Performance of Plainchant: Some Preliminary Observations of the New Era,” *Early Music* 10 (1982), 317-28; and Paul Boncella, “Toward a New Recension of the Frankish-Gregorian Antiphonale *Missarum*,” unpublished typescript.

³ The word “neume” as used here means a notational sign, but this was not always its meaning. The word originally meant “chant phrase,” or a musical phrase without text. See Michel Huglo, “Les noms des neumes et leur origine,” *Études grégoriennes* 1 (1954), 58-59. The literature on subjects surrounding the study of the origin, dissemination, and interpretation of neumes is enormous. In addition to

Although the subject of early neumes in Europe encompasses a very wide set of traditions, the general intention of the shape of the neumes appears to have been similar in all of them, as will be seen below. As a method of controlling this investigation at its outset, therefore, initially I shall limit my remarks to refer to the staffless neumes in the St. Gall tradition (sometimes known as the Franco-Germanic tradition) from the 9th to the 12th centuries.⁴ Chart I includes the shapes of the relevant staffless neumes in St. Gall and other notational traditions as well as the usual form adopted in square notation.

The neumes I am referring to as "ornamental" can be separated roughly into two categories: liquescent and repercussive,⁵ although it will be seen below that there are many types and gradations within these categories, as well as neumes that fit both descriptions.

Hiley, Corbin, and Apel mentioned above, recent contributions include Eugène Cardine, *Semiologia gregoriana* (Sablé-sur-Sarthe, 1968), French transl. "Sémiologie grégorienne," *Études grégoriennes* 11 (1970), 1-158,, English transl. by Robert M. Fowells, *Gregorian Semiology* (Solesmes, 1982); Helmut Huckle, "Toward a New Historical View of Gregorian Chant," *Journal of the American Musicological Society* 33 (1980), 437-67, especially pp. 445-50; Leo Treitler, "The Early History of Music Writing in the West," *Journal of the American Musicological Society* 35 (1982), 237-79; Treitler, "Reading and Singing: on the Genesis of Occidental Music-Writing," *Early Music History* 4 (1984), 135-208; Peter Jeffery, *Re-envisioning Past Musical Cultures: Ethnomusicology in the Study of Gregorian Chant* (Chicago: University of Chicago Press, 1992). For a recent review of the literature on the origins of neumes see Michel Huglo, "Bilan de 50 années de recherches (1939-1989) sur les notations musicales de 850 à 1300," *Acta musicologica* 62 (1990), 224-59.

⁴ The sources of the St. Gall notation referred to here are mss. St. Gall 359; St. Gall 339; St. Gall 390-391; and Einsiedeln 121. All are published in *Paléographie musicale*.

⁵ In this categorization I am following Apel, *Gregorian Chant*, 104-108. My conclusions, however, are not completely in agreement with Apel's.

Chart I

	St. Gall	Aquitanian	English	Lorraine	Beneventan	Square
<i>virga</i>	/	/	l	/	l	7
<i>tractulus</i>	—	—	—	~	~	■
<i>punctum</i>	■
<i>clivis</i>	^ P	^ R	^ P	^ R	^ R	■
<i>pes</i>	✓ J J	!	! J	✓ P	J R	3
<i>plica</i>	2 v P	2 v	2 v	2 v	!	7
<i>quilisma</i>	✓	. r	. ✓	✓	✓	✓
<i>apostropha</i>	2	.	.	~	— !	■

	St. Gall	Aquitanian	English	Lorraine	Beneventan	Square
<i>bistropa</i>	”	rr	.. l ^h	.. ■
<i>tristropa</i>	””	... ^c	...	rrr	... l ^h	... ■■
<i>oriscus</i>	4	4 7	4	2	w 3	4
<i>pressus</i>	π π	· n	11 ^c	· 2 π 2	4	· π
<i>scandicus</i>	! j	· i	i	5 2 2	π	5 1
<i>salicus</i>	! 4 j	· i	j	j	j	· 5
<i>torculus</i>	∫ ∫ ∫	~ n · 2	∫ ∫	Λ ~ 2 ρ	π	· 4
<i>climacus</i>	1. ρ	· i	∫	≡	~ 4	7 4 4 4
<i>porrectus</i>	π	7	π	~ 2	π	π

Liquescent Neumes⁶

Liquescent refers not to an autonomous neume but to a sound variant of what in later centuries would function as a basic neume: *punctus*, *clivis*, *pes*, *climacus*, etc., the written difference being that the “basic” forms of the neumes normally involve *virgae*, *tractuli*, and *puncti* (straight vertical or slanted strokes, dashes, and dots), whereas the liquescent forms of these neumes have curved or imprecise lines.⁷ In later square notation the liquescent forms of the basic neumes were called plicated, although *plica* had a broader meaning, as discussed below.

Guido of Arezzo, in his *Micrologus* of 1028, describes the liquescent as lacking precise pitch: it consists of a “gliss” between two solid pitches. His description of the sound is that “the interval from one note to another is begun with a smooth glide and does not appear to have a stopping place en route.” He also states that it is possible to substitute a “full” sound in place of the liquescent which, as we shall see later, indicates that the actual sound of the liquescent is reduced in addition to not having a fixed pitch.⁸ Guido’s example (see Example 1), has a “G” to be sung with a full sound, followed by a liquescent sound that connects the first note to the “F” below it.

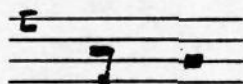
⁶ For the study of liquescent neumes see Heinrich Freistedt, *Die liqueszierenden Noten des gregorianischen Chorals*, Veröffentlichungen der gregorianischen Akademie zu Freiburg, Heft 14 (Freiburg, 1929); Johannes B. Göschl, *Semiologische Untersuchungen zum Phänomen der gregorianischen Liqueszenz: Der isolierte dreistufige Epiphonus praepunctis, ein Sonderproblem der Liqueszenzforschung*, 2 vols., Forschungen zur älteren Musikgeschichte 3 (Vienna, 1980); David Hiley, “The Plica and Liquescence,” in Gordon A. Anderson, *In Memoriam*, 2 vols., Musicological Studies no. 49 (Henryville, Ottawa, Binningen, 1984), vol. 2, 379-91; and Andreas Haug, “Zur Interpretation der Liqueszenzneumen,” *Archiv für Musikwissenschaft* 50 (1993), 85-100.

⁷ Haug, “Liqueszenzneumen,” discusses the liquescent sound from both a literary and vocal point of view as a “semivocal.”

⁸ “Liquescent vero in multis voces more litterarum, ita ut inceptus modus unius ad alteram limpide transiens nec finiri videatur. Porro liquescenti voci punctum quasi maculando supponimus hoc modo: [Example 1.] Si eam plenius vis proferre non liquefaciens nihil nocet, saepe autem magis placet. Et omnia quae diximus, nec nimis raro nec nimis continue facias, sed cum discretione.” Guidonis Aretini, *Micrologus*, ed. Jos. Smits Van Waesberghe, *Corpus scriptorum de musica*, no. 4 (Rome, 1955), 175, 177.

Rather than simply sliding the voice down a step, however, the location of the tiny liquescent mark indicates that the voice is to slide from "G" to "D" before moving to "F."⁹ As we shall see below, the entire execution of the liquescent was to be done without separate articulation. In this example the "G" is articulated, but once the gliss is begun, it slides first to "D" and continues on to "F" without interruption.

Example 1. Guido of Arezzo, Liquescent musical example.



Further details about the application of the liquescent sound are found in the *Metrologus*, a 13th-century amplification and elaboration of Guido's instructions. According to the *Metrologus*, the liquescent is a constricted sound to be applied only to specific consonants and vowels and to certain intervals.¹⁰ The treatise provides

⁹ The example here is from a version of the treatise in which the examples are written in square notation. Many of the early copies represent the example with the letters G – D – F. For a complete list for this example see Guidonis Aretini, *Micrologus*, pp. 176-77.

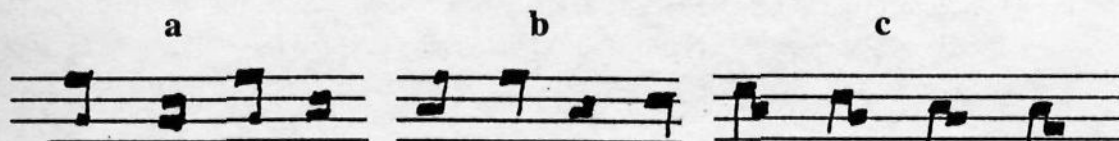
¹⁰ "Liquescent autem in multis voces more litterarum, id est consonantiarum, ita ut inceptus modus unius ad alteram limpide transiens nec finiri videatur. Porro liquescenti voci descendendo punctum quasi maculando supponimus, aliquando super consonantias ut reg, dig, leg, ag, vim, vem, tum, tem et super consimiles sonando usque ad proximam vocem vel notam iuxta se vel supra se hoc modo: [example 2. a] ascendendo vero hoc modo [example 2. b] Et si proxima nota subsequens inferior se fuerit, tunc non est liquescens, sed duae notae sunt post hanc liquescentem hoc modo: [example 2. c] Aliquando sequitur alia nota inferior se similiter fiet et post has notas. Super vocales vero non faciat liquescentem vel strictionem nisi tantum super au, eu, luy, ley, et ey. Quando vero super a e i o vel u, sic formatur: [example 2. d] Tunc vero ultima pro duabus reputatur vocibus. Et si eam, scilicet liquescentem plenius vis proferre non liquefaciens nihil nocet, saepe autem magis placet. Et omnia quaecumque diximus nec nimis raro nec continue facias, sed cum discretione." *Expositiones in Micrologum Guidonis Aretini*, ed. Joseph Smits Van Waesberghe (North-Holland Publishing Co., 1957), 89-91.

examples of the liquescent that are somewhat different from the single example in Guido; I reproduce them as Example 2. Examples 2a and b, for syllables with consonants ut, reg, dig, leg, ag, vim, vem, tum, tem, etc., indicate that the liquescent sound usually is to ascend or descend directly to the pitch of the next full note, rather than to go beyond the next note and return, as does Guido's example. Of the four liquescent examples in Example 2a and b, three indicate direct motion to the pitch of the next full note, but in the second set of pitches in 2a the liquescent dot is marked a step below the next full pitch, thus indicating that, at least in descending intervals, there was the choice of direct or indirect liquescent motion. The author of the *Metrologus* explains the circumstances for a compulsory use of the indirect liquescent motion, as seen in Guido's example: a liquescent is not performed directly between the notes of a descending diatonic interval (although this is possible for ascending passages, see Example 2b, second liquescent). In order to liquesce in a descending scalar passage it is necessary to move beyond the next note with the liquescent sound and then return, as in Example 2c. The technique also was optional for descending intervals of more than a tone, as described above. Although not described in the text, Example 2c also shows that the indirect technique is employed to liquesce between notes on the same pitch (see Example 2c third pair, where the liquescent descends a second and returns to the same pitch for the first note of the next pair). The writer also states that other, lower intervals can be used as the point of liquescence in these situations. This last point must include the interval of a fourth used in Guido's example as well as the seconds and thirds found in example 2c, but there is no information as to how much larger a liquescent interval can be.

According to the *Metrologus*, liquescent sound also can be performed in conjunction with vowels and with syllables that have the diphthongs au, eu, luy, ley, and ey. When pure vowels are involved, however, once the liquescent sound has arrived at the next written pitch, that pitch is to be repeated, thus making a clear articulated separation between the two neumes as in Example 2d.







Example 2. *Metrologus* liquescent musical examples.

a, b, c, for descending liquescent notes on syllables ut, reg, dig, leg, ag, vim, vem, tum, tem, and similar consonances and diphthongs. d, liquescents on vowels.








Clivis and Pes

The liquescent shapes for the two-note neumes *clivis* and *pes* (also called *cephalicus* and *epiphonus*)  , and for the three-note neumes *climacus* (*ancus*) , *torculus* (*pinnosa*) , *scandicus* , and *porrectus* , all have a curved final mark for the indefinite pitch of the gliss, as described above. As per the above instructions for the application of a liquescent, the correct syllables would have to be present, and following the liquescent neume there would have to be at least one additional note that would serve as the destination of the gliss. As demonstrated above in conjunction with Example 2, depending upon the interval and direction, these liquescent forms could consist of a direct gliss between two fixed pitches or a gliss of indirect motion that moves to a more distant pitch before returning to the next written note, as in Guido's example (see Example 1).

Plica

The word "plica" was often used after the 13th century to describe the liquescent forms of the basic two-note neumes, but the word actually had a broader application. *Plica* is described in the treatises as either a one- or two-note neume. It always involves two sounds, but in some treatises it is considered to be the inflection, either ascending or descending, of a single note.¹¹ As the following dis-

¹¹ For example, it is described as an inflected one-note neume by Jerome of Moravia (meaning that it consists of a full sound and a partial sound), but as a two-note neume by the anonymous author of the *Summa musicae*. See Simon M. Cserba,

cussion will make clear, both descriptions are correct to some degree; the difference lies in how one considers a second, ornamental sound that is added to a fixed pitch. Some aspects of the *plica* are identical to the liquescent forms of neumes described above, but whereas the other liquescents were thought of as connecting two fixed pitches and were linked to specific text syllables, the *plica* was a decorative ending to a single pitch and could be applied to any breve or longa, including those without text. In a continuous melodic line the two types would often sound alike, and therefore it is not surprising that there is no difference between the early written form of the *plica* and those of the liquescent *clivis*, and *pes*. In early notation the descending *plica* is identical to the liquescent form of the *clivis*, while the ascending *plica* resembles the liquescent *pes*: *plica* , *clivis* , *pes* .

Information regarding performance of the *plica* is found in several treatises. The anonymous author of *Ars musicae mensurabilis secundum Franconem* and Lambertus in his *Tractatus de musica* both state that a *plica* (that is, the second sound) must be formed in the back of the throat with the epiglottis. Walter Odington's description of the *plica* adds that it is a semivocal, that is, a half sound.¹² He elaborates this by saying that it is a "tone and the inflection of that tone," by which he may be referring to the use of a small inflection of pitch, for example, a quarter-tone. Lambertus mentions the addition of a subtle vibration in the performance of the *plica*, and the anonymous author of the *Breviarium regulare musicae* states that the *plica* receives exactly half of the value of the written neume, i.e., the fixed pitch and the *plica* inflection receive equal divisions of the time unit.¹³ Closely related to the performance described above for

ed., *Hieronymus de Moravia, O. P.: Tractatus de musica*, Freiburger Studien zur Musikwissenschaft 2 (Regensburg, Verlag Friedrich Pustet, 1935), 181-82; and Christopher Page, ed., *The Summa Musice: a Thirteenth-Century Manual for Singers* (Cambridge, Cambridge University Press, 1991), lines 523-40.

¹² For a discussion of the semivocal see Freistedt, *Die liqueszierenden Noten*, ch. 2.

¹³ "De plicis in figuris simplicibus. Plica est nota divisionis eiusdem soni in gravem vel in acutam, et debet formari in gutture cum epygloto." Anonymous, *Ars musicae mensurabilis secundum Franconem*, ed. Gilbert Reaney and Andreas Gilles, *Corpus Scriptorum de Musica* (Rome, 1971), 44. "Fit autem plica in voce per compositionem epiglotti cum repercussione gutturis subtiliter inclusa." Lambertus (Pseudo-Aristotli), *Tractatus de musica*, in Edmond de Coussemaker, *Scripto-*

the liquescent neumes, are the non-liquescent forms of both *clivis* and *pes*. The *Summa musicae* describes the *clivis* as having a dark and inflected sound on the second pitch, a description close to that of the *plica*. And in describing the non-liquescent *pes*, the same treatise states that once the upper note of the neume is reached the singer should abandon the actual pitch by changing it to a liquescent sound,¹⁴ meaning that the second note starts as a full sound and then becomes a *plica*. In actual performance, therefore, the "basic neume" forms of *clivis* and *pes* already contain aspects of the fully liquescent forms. The notational symbols for the non-liquescent forms differ from the liquescent in that they have *virgae* reflecting the presence of a fixed pitch as opposed to the indefinite curved mark used to signify the liquescent gliss. The description of the non-liquescent forms of these two neumes indicates that inflected sound and the addition of glissing were a basic part of the medieval singing technique—elements that were exaggerated when indicated by the liquescent neume forms.

Quilisma

The *quilisma* is a liquescent sound represented by a wavy or jagged line connecting two ascending (and occasionally descending) notes a

rum de musica medii aevi, 4 vols. (Paris, 1864, repr. Hildesheim, 1963), vol. 1, 273. "Plica est inflexio vocis a voce sub una figura. Solae longae et breves sunt plicabiles. Plicarum alia ascendens, alia descendens, quae in plano <cantu> vocantur semitonus et semivocalis." Walter Odington, *Summa de speculatione musicae*, ed. Frederick F. Hammond, *Corpus scriptorum de musica* (Rome, 1970), 129. "Secundo de notis solitariis plicatis est dicendum. Unde notandum est quid sit plica secundum magistrum Franconem, capitulo secundo musicae suae: plica est nota divisionis eiusdem soni in grave et acutum. Et secundum Walterum Odyngton, libro sexto, capitulo secundo: plica est inflexio vocis a voce sub una figura. Ex hiis definitionibus pono eis quartam conclusionem. Conclusio. Omnis nota praeter simplicem est plicabilis. Propter plicam nec augmentatur nec minuitur tempus alicuius notae a tempore eiusdem note plicatae." Anonymous, *Breviarium regulare musicae* (Willelmus), ed. Gilbert Reaney, *Corpus scriptorum de musica* no. 12 (Rome, 1966), 26-27.

¹⁴ "Clivis dicitur a cleo, quod est "inclino," et componitur ex nota et semi-nota, et signat quod vox debet inflecti . . . Pes notulis binis vult sursum tendere crescens; Deficit illa tamen quam signat acuta liquescens. Vult notulis binis semper descendere clivis, obscurumque sonum notat illius nota finis. Praecedit pausam vel stat pausantis in ore, Ac si perfecte notule fungatur honore." Page, *The Summa Musicae*, lines 525-54.

third or fourth apart. its interpretation has been the subject of several different theories, some based on suppositions drawn from its notational shape, and others from its resemblance to the *kylisma* in Byzantine chant.¹⁵ The earliest-known mention of *quilisma* is in the late 9th century by Aurelian of Réôme, who described it as being a "tremulous and rising sound." The *Summa musicae* observes that the word means "bending," and that it is written with up and down marks.¹⁶ Fortunately, some details about the correct performance of a *quilisma* can be ascertained from the simile drawn between *quilisma* and the ornament known as *tremula*, by both Aribio Scholasticus in his *De musica*, and the anonymous author of the *Commentarius in Micrologum*.

According to these and other writers, the *tremula* is an unwritten ornament applied to certain notes under specific circumstances.¹⁷ It is clearly described in the *Commentarius* as "alternating strong and weak pulses of the same pitch, as if trembling." In modern terms this is usually referred to as an "intensity vibrato," since it changes volume but not pitch as does the more common vibrato. In context Aribio and the author of the *Commentarius* were attempting to separate the *tremula* from a similar unwritten ornament called a *morula*, an ornament that consisted of the rapid alternation of sound and silence on the same pitch, similar to Giulio Caccini's *trillo*. In order to explain the difference between these two, in addition to the verbal description, the *tremula* was likened to the *quilisma*.¹⁸ The graphic

¹⁵ The theories are summarized in Apel, *Gregorian Chant*, 113-15.

¹⁶ "Versus istarum novissimarum partium tremulam adclivemque emittunt vocem." Aureliani Reomensis, *Musica disciplina*, ed. Lawrence Gushee, Corpus scriptorum de musica no. 21 (Rome, 1975), 15. "Quilisma dicitur 'curvatio,' et continet notulas tres vel plures quandoque ascendens et iterum descendens, quandoque e contrario." Page, *The Summa Musicae*, lines 523-40.

¹⁷ For a lengthy discussion of "tremula" in various treatises, see my forthcoming monograph, *The Sound of Medieval Song* (working title).

¹⁸ "Morula dupliciter longior est vel brevior, si silentium inter duas voces. Eodem modo morula dupliciter est brevior, si taciturnitas inter duas simpla est ad aliam taciturnitatem inter duas voces. Quod dicit: aut tremulam habeant, puto intelligendum sic esse: Tremula est neuma quam gradatam vel quilisma dicimus, quae longitudinem, de qua dicit duplo longiorem cum subiecta plana virgula denotat, sine qua brevitatem, quae intimatur per hoc quod dicit: vel duplo brevior, insinuat." "Et non solum morula morulae conferra-

representation of the *quilisma*, as can be seen in Chart I, is a waving line, which has always been interpreted as a sign for a waving sound, although there has been some question as to whether or not the waving involved a vibrato-like change of pitch. From the association of the *tremula* and *quilisma* in the two treatises, we can now be certain that the *quilisma* was intended to be a volume pulsation as it slides between the two stable written pitches without stopping en route. This would mean that the *Summa musicae* phrase about the *quilisma* "ascending and then descending" is a reference to the shape of the mark and the volume of the sound rather than to a vibrato-like pitch change.¹⁹


Repercussive Neumes

"Repercussive" refers to those neumes that consist of two or more marks on the same pitch sharing a single syllable. There are a number of these in early chant notation, some of which are all on a single pitch, and others that involve the repetitive marks in conjunction with neumes on other pitches. The one graphic element that unites all of them and separates them from the liquescent neumes is that the individual strokes of repercussive neumes are separated while those of the liquescent variety are joined together. Any of the repercussive neumes could be written separately (i.e., over a syllable of text) or in conjunction with other neume forms, meaning that they had status as a separate sound or could grace other notes.

tur, sed etiam tremulae et connexis vocibus et e converso, quocumque modo disponentur in cantu. Tremula est similiter vox repercussa sicut morula, sed illud interest, quia in morula voces eadem aequali impulsu vocis proferuntur, in tremula vero eadem nunc maiori, nunc minori impulsu vocis efferuntur quasi tremendo." "Repercussio alius morula, alius tremula, et hoc est: aut habeant morulam, aut tremulam, id est varium tenorem per varium impulsu, non per variam vocem." Joseph Smits van Waesberghe, ed., *Aribonis, De musica*, Corpus scriptorum de musica no. 2 (Rome, 1951), 66; Waesberghe, *Expositiones in Micrologum*, 153, 149, 150.

¹⁹ It should be noted that in some manuscript traditions the *quilisma* is replaced by an *oriscus*. As discussed below, this would change the nature of the ornament from pulsation to a mordent or trill-like sound. I would consider this to be a regional preference.

Apostropha, Bistropha, Tristropha

Three of the percussive neumes, the *apostropha*, *bistropha*, and *tristropha*, would appear to represent variations of a single idea. Very little is found in the treatises that describes or even mentions these neumes, although they are commonly found in early chant manuscripts, especially Graduals, and occasionally they can be found in groups.²⁰ The only theoretical statements about any of these neumes appear to be that in the 9th-century treatise by Aurelian of Réôme and a sentence in Walter Odington's treatise from ca. 1300. Aurelian's information is in reference to the third introit tone over the words "sancto" and "semper," in which a comparison is drawn between the quick percussions of a *tristropha* , and the beating of a hand.²¹

By the phrase "beating of the hand" Aurelian could be referring to two possible images: either the sound of clapping hands, or the up-and-down motion of a hand beating time. The former image would suggest quick articulations of the same sound similar to that suggested above for the *quilisma*, whereas the latter would suggest an ornament similar to a baroque mordent, double mordent, or inverted mordent. In either case the difference among the *strophæ* neumes would be the number of beats. The idea of a mordent-like change of pitch is certainly a possible interpretation of Aurelian's phrase, but other evidence suggests that the former interpretation is the correct one.

Aurelian's use of the phrase "quick beat/percussion" (*celerum ictum*) suggests repeated articulation, and the neume shapes themselves as separate marks indicates separation of sound. This is confirmed by Walter Odington, who makes it clear both that the sounds are repeats of the previous note and that they are separated: "An *Apostropha* is an accented type which takes up the last vocal sound with repeated incomplete sounds as in this figure:" The figure he uses to represent the separation consists of three unconnected paral-

²⁰ Several examples of groups of these neumes are given in Apel, *Gregorian Chant*, 354.

²¹ "Sagax cantor, sagaciter intende, ut si laus nomino trino integra canitur, duobus in locis scilicet in XVI syllaba, et post in quarta decima, trina ad instar manus verberantis facias celerum ictum." Aureliani Reomensis, *Musica disciplina*, 122.

lel lines.²² These facts align the *strophas* closely with the other writ-ten repercussion neumes discussed above and below (*quilisma* and *pressus*) as well as with the unwritten *tremula* and *morula*. In that case these neumes may be closest in performance practice to the *morula* as described above (quick alternation of sound and silence on the same pitch). Further, their shapes as curved lines similar to a *plica* instead of a *punctum* suggests the performance practice described above associated with both the curved *plica* marks and the liquescent *pes* and *clivis*: a change of tone color accompanied by a slide away from the pitch. The more probable conclusion, therefore, is that the performance practice indicated by *apostropha*, *bistrophas*, and *tristrophas* neumes is a rapid articulation of the preceding pitch in which the voice enters each new pulse on pitch and then slides flat with a reduced sound.

Oriscus


The *oriscus* is a neume that could be classified as both liquescent and repercussive. It has been considered by some modern writers to be related to the *strophas* neumes,²³ but only the simplest form of the *oriscus* resembles the *apostropha* (or the *plica*). The usual form of the neume, having two or more connected curves, suggests that it is more closely related to the liquescent neumes. Whereas the *strophas* are all separated hook-shape marks, all of the parts of the *oriscus* shape are joined as a single unit with either a final connected *virga* or a curved and indefinite final stroke found in the liquescent shapes.²⁴


The connected curved shape of most of the *oriscus* neumes suggests either the *tremula* type ornament, in which the curves represent unin-terrupted loud and soft pulses, or possibly an actual change of pitch, similar to a mordent. Recent research suggests that it was

²² "Apostropha est species accentus quae tollit ultimam vocalem dictionis cum sequens dictio inchoat a vocali cuius figura est haec: " Walter Odington, *Sum-ma de speculatione musicae*, 94.

²³ Mocquereau, *Le nombre musical*, 145-153, classifies it as such. Apel, *Gregorian Chant*, 106-111, contends that it was at some point absorbed into the *strophas* forms, making the *oriscus* and *apostropha* identical, although he suggests that they may have been different sounds at an earlier stage.

²⁴ For a discussion of the many variations of neumes including the *oriscus* symbol see Cardine, *Gregorian Semiology*.

most likely of the mordent type. John Harutunian conducted an intense study of nearly 700 occurrences of the *oriscus* in the unheighted neumes of an 11th-century Roman Graduale, which he compared to a related 13th-century manuscript in which the notation is heightened and on a staff. He found that although an *oriscus* placed on most steps of the scale would be translated to a single neume, all of those on the note A were translated in the later manuscript as A, B, A.²⁵ There is no reason to believe that a single neume would have two completely different meanings in a single manuscript: one ornamental, one not. The single note translation must reflect the same inability to represent the ornamental sound as is found in other staff notation systems; in square notation the *oriscus* is represented as a single neume with extensions up and down . The investigator reasoned that the difference in translation had to do with the medieval unwillingness to represent as a fixed pitch a sound that could not be represented so exactly. The interval between A and B included the equal possibility of B^b, thus suggesting an inexact pitch, and thus when an *oriscus* occurred on that pitch the scribe was able to notate it as an ornament that included an upper neighbor. When placed on other pitches a written note for the middle pitch would have indicated a fixed tone or semitone and therefore the correct instability of its pitch could not be notated.²⁶

We must be careful not to put too much weight on the later notational forms, but in this case that evidence is supported by the actual shape of the neume itself as well as by the known performance practice of similar marks in composite neumes involving the *oriscus* shape. The *oriscus* shape is interpreted as *quassa* or *cassam* (= shaking) when written as part of a *pes quassus*, for example, which is a combination of an *oriscus* linked to a *virga* . Walter Odington describes the performance of the *pes quassus* as "a tur-

²⁵ John Harutunian, "A Comparison of the Oriscus in the Introits of the Manuscript Vatican Latin 5319 with its "Translation" in Those of the Manuscript Archivio di San Pietro F.22," unpublished M.A. thesis, University of Pennsylvania, 1976. For a detailed discussion of the relationship of the two manuscripts see Thomas H. Connolly, "The *Graduale* of S. Cecilia in Trastevere and the Old Roman Tradition," *Journal of the American Musicological Society* 28 (1975), 413-48.

²⁶ Hartunian, "A Comparison," 62. He notes that this "concurs with Dom Mocquereau's finding [*Le nombre musical*] that the 'tonal indecision inherent in the oriscus was often lost in the transcription'," 59.

bulent note performed with a trembling and shaking voice."²⁷ The anonymous author of the St. Emmeram treatise also discusses the possible performance of a *morula* as *quassa*, which associates the sound of an *oriscus* with that of a *quilisma*.²⁸ As seen above, the performance of the *morula* is described by several theorists as articulated pulses of the same pitch rather than as a mordent-like varying of pitch. The two ornamental ideas are quite similar to one another and I would suggest that the choice of pulse or pitch change could have been a regional matter, as described below.


The *oriscus* itself, therefore, was undoubtedly performed as a liquescent version of a mordent, i.e. a quick move to a quarter-tone (or other non-diatonic pitch) above the written pitch and return. As in the descriptions of liquescent neumes above, the three notes would be executed as a sliding sound rather than as cleanly articulated notes. The *oriscus* therefore, is correctly classified as a liquescent neume, but since it often was used to grace the fixed pitch of a preceding neume—and thus begun as an articulated repetition of the previous pitch—it would also have been a percussive neume.

Pressus

The *pressus* neume usually acts as a grace on the neume that precedes it. From the *Summa musice* description we know that it has two forms: the short, which has two marks, and the long with three,

²⁷ "Pes quassus dicitur quia voce tremula et multum mota formatur: quassum enim violentus motus est." Walter Odington, *Summa de speculatione musicae*, 95.

²⁸ "Tempus igitur, prout hic sumitur, est morula, ubicumque recta brevis habet fieri . . . Et nota, quod tempus potest tripliciter considerari et hoc proportionaliter, quoniam aut per vocem rectam aut cassam aut omissam . . . vel vox quassa a quassa dicta, est idem quod vox imperfecta aut etiam semiplena, per sonos varios diminuta." Jeremy Yudkin, *De musica mensurata: The Anonymous of St. Emmeram* (Bloomington, 1990), 102. A similar statement is found in the *De mensurabili musica* of Johannes de Garlandia: "Sed huiusmodi tempus habet fieri tripliciter: aliquando enim per rectam vocem, aliquando per vocem cassam, aliquando per vocem amissam. Unde recta brevis habet fieri in primo tempore, videlicet per vocem rectam. Sciendum est autem, quod huiusmodi duae tales breves, quae ita formantur, faciunt unam rectam longam." Erich Reimer, *Johannes de Garlandia: De Mensurabili Musica*, 2 vols. (Wiesbaden, 1972), 38.

and that it should be sung “evenly and rapidly.”²⁹ There is some diversity among the St. Gall versions of this neume, although all of the forms begin with a *virga* and end with a *punctum*, both of which indicate a definite pitch. Attached to the top of the *virga* is a mark that in many notation traditions resembles an oriscus and which in similar neumes discussed above has been a symbol for indefinite liquescent pitch: . When translated into square notation the *pressus* is represented as a repeat of the previous pitch followed by a lower neighbor.

Based on both the visual representations and the *Summa* description, it is possible to speculate that the *pressus* begins as a quickly articulated pulsation of the first written pitch (the *virga* stroke), and ends with a lower (and separately articulated) sound on a definite pitch (the *punctum*). The waving mark in the middle attached to the *virga* would represent an *oriscus*-type mordent. The *pressus*, therefore, also was both a liquescent and percussive neume.

The “ornamental” neumes discussed above are those for which I have been able to find performance information in medieval theoretical treatises, but a glance at the manuscripts will show that there are others.³⁰ What they represent in terms of their performance practices, as described in the treatises and represented in the notation, is a vocal style that includes sliding pitches, pulsing notes, contrasting bright and dark sounds, notes produced in the epiglottis while vibrating, and combinations of all of these sounds. Far from being foreign to the “usual” singing style of the period, the high density of “ornamental” neume shapes in the manuscripts from all geographical areas gives evidence that they were regularly employed in many of the chants. Whereas the particular neumes discussed above may be

²⁹ “Pressus dicitur a premendo, et minor continet duas notas, maior vero tres et semper debet equaliter et cito proferri.” Page, *The Summa musicae*, lines 253-60.

³⁰ Hiley, *Western Plainchant*, 360, for example, mentions *virga strata*, *pes stratus*, *pes quassus*, and *salicus*. Mocquereau, *Le nombre*, Corbin, *Die Neumen*, and Michel Huglo, “Les noms des neumes et leur origine,” *Études grégoriennes* (1954), 53-67, include other formations and different names for the same neume shapes. The possibility of quarter-tones as the significance of five special signs in Ms. Montpellier H. 159 is discussed in Joseph Gmelch, *Die Vierteltonstufen im Messtonale von Montpellier* (Eichstätt, 1911), a theory dismissed by Jacques Froger, “Les prétendus quarts de ton dans le chant grégorien et les symboles du ms. H. 159 de Montpellier,” *Études grégoriennes* 17 (1978), 145-79.

"ornamental" in terms of a later perception of melody, their frequent use in a large percentage of the early notation indicates that the sounds they represented must have been part of the basic musical style and of the vocal technique employed by the singers, and therefore an integral part of their perception of music. With this in mind we should look again at the sounds represented by *all* early neume forms.

For each of the neumes discussed above the relationship between the desired sound and its representation in early notation is striking, and indicates that the connection between written form and performance practice was at least one of the intentions of the early notation forms. In fact, the *Summa musicae* states as much in the beginning of its discussion of neume shapes, much of which has been quoted above:

In former days singers delighted in music so much that they wished to teach the rules of the art to their descendants. They therefore devised new figures to record the various movements of notes. They called them "marks" because from that moment the syllabus of vocal music was secured. Their names are clivis, plica, virga, quilisma, punctum, and podatus; the pressus should be classed with these.³¹

Similar statements can be found in several other treatises, but these kinds of remarks always have been interpreted as referring to the notation of pitch and duration, a meaning that would be correct only in the later forms of notation but not for the early unheighted forms. In the light of the preceding discussion, it is possible to speculate that even for the early heightened neumes (prior to the adoption of square notation) the references in the treatises to the use of notation to transmit the chant would more probably refer to the transmission of performance nuances.

The interpretation of early notation forms as indications of performance would also explain the variety of neume shapes employed to represent the same number and general configuration of pitches, as

³¹ "Olim cantores cantu sic complacuerunt, Heredesque suos voluerunt scita docere. Contigit ergo novas hos ingeniare figuras, Ut possent varias vocum figurare tenuras, Quas dixere notas certus quod ab inde vocatur, Cursus cantandi qui vocali sociatur. Clives, plice, virga, quilismata, puncta, podati, Nomina sunt harum; sint pressi consociati." Page, *The Summa Musicae*, lines 540-54. Translation after Page.

can be seen in Chart I. If we posit two simple hypotheses suggested by the preceding discussion, the variety of shapes takes on meaning: 1) that *virgae*, *tractuli*, and *puncti* indicate fixed pitch and curved and indefinite lines represent sliding or indefinite pitch; and 2) that separated strokes indicate separate articulations whereas connected strokes (ligatures) indicate connected sounds. The difference between the St. Gall *scandicus* and *salicus*, for example, would lie in the way in which the second note was to be sung; the curved line for the second note would indicate a *plica*-like treatment in which the voice loses focus and slides from pitch, whereas the *punctum* in the *scandicus* indicates focused pitch. Support for this interpretation of the *salicus* is that in some notations the *salicus* is replaced by a *punctum* and a *pes*, with the first stroke of the *pes* in a curved shape:



, another way to indicate a liquescent second note, but in this case without a separate articulation for the third sound.³² According to the above-stated premise concerning the relationship of neume shape to nuance, one can see numerous varieties of these shapes in the compound neumes, apparently indicating various combinations of articulation and of definite and indefinite pitch.

The problems resulting from variant neume forms, both within a single tradition and from one region to another, have engaged scholars for over 150 years. Recently the approach of semiology has been added to that of palaeography in an attempt to refine the techniques and arrive at conclusions regarding the reason for the choice of each particular sign.³³ Most of these attempts have been constricted by the assumption that the signs relate to either pitch or duration or both, and that there was a single performance tradition for each neume, regardless of variants in the individual components of its shape. Although on occasion some acknowledgement is given to the relationship between certain neumes and performance practice, this factor is often dismissed as irrelevant, or not pursued beyond a superficial consideration.³⁴ If, however, the notation of performance

³² For additional comparative examples see Göschl, *Semiologische*, 163-65.

³³ To name a few of the more recent studies: Cardine, *Gregorian Semiology*; Göschl, *Semiologische* (including an introductory essay by Cardine); and Leo Treitler, "Palaeography and Semiotics," in *Musicologie médiévale: notations et séquences*, ed. Michel Huglo (Paris, 1987), 17-27, as well as several other articles in this collection.

³⁴ For example, it has been dismissed by Cardine in *Gregorian Semiology*, 7, and in his introduction to Göschl, *Semiologische*, pp. xvii-xx. The connection

practice is considered to be the prime reason for the variation in neume forms, a logical connection is drawn between the "ornamental neumes" for which there is information, and the remainder of neume shapes. This does not exclude the possibility of pitch and duration as part of the meaning of the neume variants; those elements are basic to any performance practice and thus this subject is undoubtedly more complex than stated here. What I wish to point out is that the primary reason for the variety in shapes for the same grouping of notes must have been the desire to record or transmit the variety of performance nuances beyond those of pitch and duration.

This conclusion would also explain the reason for the several different styles of notation: regional preferences. The existence of local language dialects is a well established fact, as is that for local costumes, food, art, etc. Early liturgical manuscripts document the use of local preferences for feasts and prayers as well as certain chant melodies or versions of chant melodies. One can safely assume, therefore, that local dialects of singing also existed, and it is this that is recorded in the different notation traditions.³⁵ On Chart I, what can be seen in the different manuscript traditions is not only the local scribal preference for neume shapes, but more importantly that





between neume shape and performance is suggested in Corbin, *Die Neumen*, and in Hiley, *Western Plainchant*. Haug, "Zur Interpretation der Liqueszenzneumen," is an interesting exception. Two scholars who have gone to some length in considering the subject are Kenneth Levy and Leo Treitler. Treitler, who has addressed the subject in several articles, has described the relationship of neume shape to vocal practice similar to that stated here although that point is peripheral to his research. Whereas Treitler is interested in the origin of the signs, I am interested in what information they conveyed to the singers and what this can tell us about the vocal style of the period. His conclusions for the most part are compatible with those I put forward. See, for example, Treitler, "Oral, Written, and Literate Process," *Speculum* 56 (1981), 471-91, "The Early History of Music Writing," *Journal of the American Musicological Society* 35 (1982), 237-79, and "Reading and Singing," *Early Music History* 4 (1984), 135-208. Levy's research has also led to conclusions along the lines of my work. The extent of our agreement can be seen in his statement that the "curvature used to signify 'ornamental' neumes (quilisma, oriscus, apostrophus) and liquescence are explainable . . . as simple written analogues of the vocal nuances"; and again when he refers to "nuance-rich neume-species . . . favored for their wealth of pitch-specifiers and nuance-indicators." Levy, "The Origin of Neumes," *Early Music History* 7 (1987), 76, 84.

³⁵ For a number of quotes from theoretical treatises outlining differences in regional singing practices see McGee, *The Sound of Medieval Song*, forthcoming.

these shapes reflect the local tradition of vocal nuances: the articulation, note inflection, and other practices of that region.

The different versions of the *torculus* provide an opportunity to examine interesting differences in the notation traditions. Aquitanian notation includes two forms of the *torculus*, one with the first note separated and the second and third joined, the other with all three notes joined. In this case, since all of the marks are *virgae* and *puncti*, probably meaning that all notes were sung on pitch, the difference would have been one of articulation: joined notes are slurred, separated ones are individually articulated. A statement to that effect can be found in the *Tractatus de musica* by Jerome of Moravia:

Notes that are ligated are joined together in singing, but disjunct notes are [sung] separately. That separation is not a rest but a sigh, and this is nothing other than the appearance of a pause approximately the length of an *instantia*.³⁶

One of the *torculus* forms found in manuscripts from both St. Gall and England ends with a curved mark, indicating the performance of a liquescent sound on the third note. The three *torculus* forms from Lorraine include a completely slurred neume , one with each note separately written as *tractuli* , and one with a liquescent third note —three different articulations of the same kind of note formation. The Beneventan notation on the other hand, contains only a single form with all straight marks and all notes connected , possibly indicating that in the Beneventan tradition the *torculus* was always performed with connected, fixed-pitch notes.³⁷

³⁶ “Secundo, quod notae in figura conjunctae conjungantur in cantu, sed disjunctae solvantur. Quae quidem disjunctio non pausa, sed suspirium dicitur, et nihil aliud est quam apparentia pausationis sive existentia unius scilecet instantis.” Cserba, ed., *Hieronymus de Moravia*, 183, translation mine.

³⁷ The subject of regional performance preferences is complicated by regional scribal traditions that may or may not reflect additional local singing practices. The *tractulus* in the Lorraine tradition, for example, has a wavy shape rather than the straight dash used in most other notations. Was this simply a scribal decoration or did it indicate a waving sound as opposed to the unwavy sound in the other traditions? I have not found information that allows me to explore this level of refinement.

The impression gained from viewing the neumes as conveyors of performance practice is one of enormous sound variety, both from one area to another and within any one tradition. The notation bears witness to the fact that the actual sound of chant in the late Middle Ages was rich in vocal color, pitch and tone inflection, and varied articulation. In many of the soloist chants neumes made up of "ornamental" shapes are more numerous than those composed exclusively of *virgae*, *tractuli*, and *puncti*. Close comparison of the variety of actual neume shapes used in different areas for the same chant reveals differences in small matters of articulation and ornamentation, even when the pitches are identical.

There are no theoretical statements in addition to those quoted above that I can call upon to further support my assertion about the relationship between the written notation and vocal performance practices. It is based on a logical extension of the known correspondence between the performance instructions and the graphic marks in those ornamental neumes that I have presented above. One of the interesting aspects of this conclusion is that it provides the basis for additional investigation of two of the most basic matters of practical performance: detailed instruction for the actual performance of late medieval chant, and a guide to the variations in performance practices from one region to another.

From the inception of our scholarly discipline musicologists have been puzzled about the purpose of the early notation system; it seems to have ignored what are for us the two most important pieces of information: pitch and durational values, and yet it stayed in use for several hundred years. My speculation is that the notation was an accurate record of the details of articulation and vocal inflection, and that the transmission of stylistic information was considered to be the most important value to transmit to musicians in the late Middle Ages. Apparently, when the chant was spread north from Rome, the element that was the most foreign and difficult to learn was the singing style. When John the Deacon in the 9th century, and Adhémar de Chabannes in the early 11th century, criticized the northerners it was not because they had problems learning the chants or singing the notes, but because they could not execute the nuances of the Roman vocal style:

John the Deacon. For the Transalpine bodies . . . roaring
deep with their thunderous voices . . . cannot bring forth

the proper sweetness of the melody, because the savage barbarity of their drunken throats while endeavoring with inflections and repercussions to utter this gentle strain, through its natural noisiness proffers only unmodulated sounds like unto farm carts clumsily creaking up a rutted hill: with the result that the sound, instead of softening the heart of the hearer as it meant to do, only serves to disturb it with exasperation and noise.

Adhémar de Chabannes. All the French singers have learned the Roman notes which they now call French, except that the French could not produce perfectly the tremblings or sweet subtleties and the notes to be elided or separated, being naturally of barbaric voice, and rather cracking their voices in their throats than projecting them.³⁸

It is reasonable, therefore, to expect that this new repertory would be notated with as much assistance as possible for the most foreign element—the vocal nuances.³⁹

Not everyone was happy with the early method of transmitting chant; as early as the time of Guido and John there was discontent with the variety of interpretations of any given melody that resulted from unheighted notation. In his *De musica* written ca. 1100, John advocates the use of Guido's new staff and bemoans the inaccuracies

³⁸ "Alpina siquidem corpora vocum suarum tonitruis altisonae perstreptentia susceptae modulationis dulcedinem proprie non resultant, quia bibuli gutturis grossitas dum inflexionibus et repercussionibus et diaphoniarum diphthongis mitem nititur edere cantilenam, naturali quoddam fragore quasi plaustra per gradus confuse sonantia rigidas voces iactat." Franz Müller-Heuser, *Vox Humana: ein Beitrag zur Untersuchung der Stimmästhetik des Mittelalters*, Kölner Beiträge zur Musikforschung 26 (Regensburg, 1963), 89, note 131, translation mine. "Omnes Franciae cantores didicerunt notam Romanam quam nunc vocant Franciscam, excepto quod tremulas vel vinnolas sive collisibiles vel secabiles voces in cantu non poterant perfecte exprimere Franci, naturali voce barbarica frangentes in gutture voces potius quam exprimentes." Jacques Handschin, "Eine alte Neumenschrift," *Acta musicologica* 22 (1950): 72. Translation after David Hiley, "Notation," *The New Grove*, vol. 13, 347.

³⁹ For an extended discussion of the medieval singing style see McGee, *The Sound of Medieval Song*, forthcoming.

that resulted from reliance on a combination of memory and unheighted neumes.

Since in the ordinary neumes [i.e. unheighted] the intervals cannot be ascertained, and the chants that are learned from them cannot be securely committed to memory, many inaccuracies creep into them . . . it can easily be seen how neumes without lines promote error rather than knowledge . . . The result is that everyone makes such neumes go up or down as he himself pleases.⁴⁰

Eventually this desire for uniformity resulted in the development of the heightened placement of the neumes, and finally in the change to square notes on a staff, although the new system was not universally adopted for several hundred years after its invention. If we posit the above theory that the original signs contained fairly accurate information about performance nuances while being less precise about pitch and duration, then we must see that when the notation gained one type of information it lost another. The change to square notation represented a reversal of the original values: at some point in the late Middle Ages pitch and duration became more important than performance nuances.⁴¹

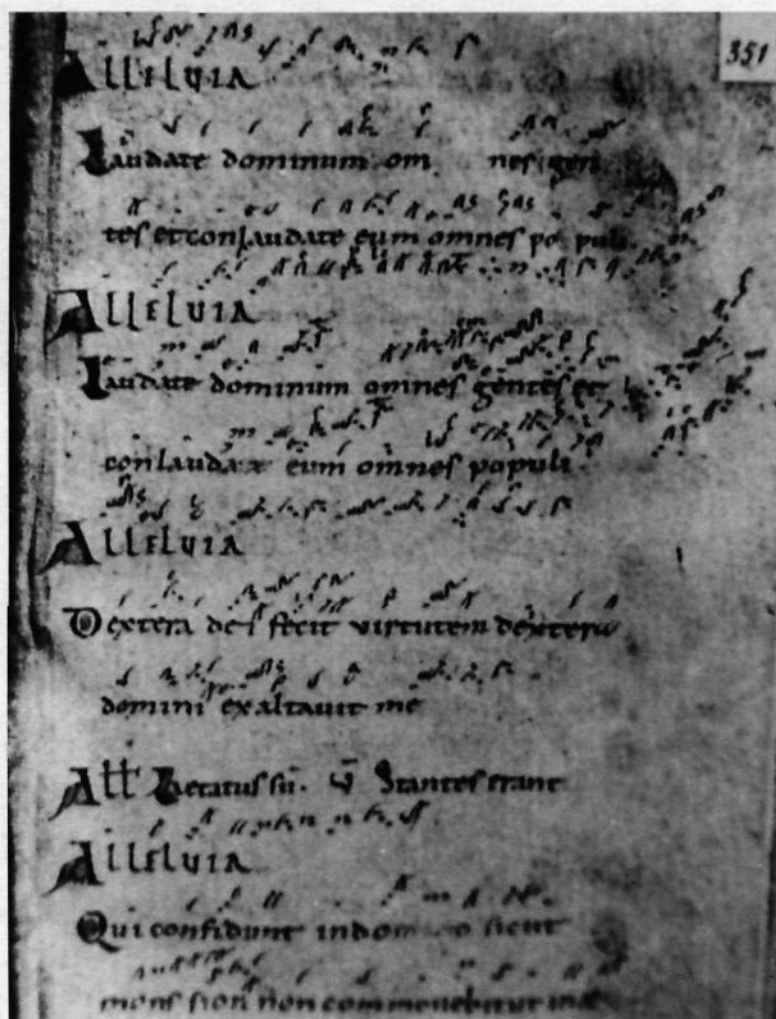
⁴⁰ "Cum enim in usualibus neumis intervalla discerni non valeant, cantusque, qui per eas discuntur, stabili memoriae commendari nequeant, ideoque in cantibus plurimae falsitates sbrepant. Hae autem omnia intervalla distincte demonstrent, usque adeo, ut et errorem penitus excludant, et oblivionem canendi, si semel perfecte sint cognitae, non admittant: quis non magnam in eis utilitatem esse videat? Qualiter autem irregulares neumae errorem potius quam scientiam generent in virgulis et clinibus atque podatis considerari perfacile est, quoniam quidem et aequaliter omnes disponuntur, et nullus elevationis vel depositionis modus per eas exprimitur." Johannes Affligemensis, *De musica cum tonario*, ed. Joseph Smits van Waesberghe, *Corpus scriptorum de musica* 1 (Rome, 1950), 133. Translation from *Hucbald, Guido, and John on Music*, transl. Warren Babb, ed. with introductions by Claude V. Palisca (New Haven and London, 1978), 147.

⁴¹ This point is also stated in Shai Burstyn, "The 'Arabian Influence' Thesis Revisited," *Current Musicology* 45-47 (1990), 136. This change in attitude may also mark the beginning of the modern view of melodic structure and separable ornament.

Starting from the above hypothesis concerning the content, intention, and purpose of early neume shapes, an investigation of the change from unheighted neumes to square notation should result in a somewhat different picture than we now have of evolving music practices in the late Middle Ages.

Example 3. Two photos of early notation that illustrate the density of “ornamental” neumes in a single chant.

Einsiedeln, Stiftsbibl. Ms. 121. St. Gall



London, British Library Ms. Harley 2961. Anglo-Norman

Pra q̄s om̄ps d̄s. ut qui resurrectio-
 nis dn̄ice sollempnia colimus.
 Perceptionis n̄re suscipe leticia meream. **P.**
 Sedis angelus ad sepulchrum domini sola clamavit
 eo opus uidentes eum mulieres nimio terroro per-
 territe astituerunt a longe. Tunc locutus est anḡl̄s
 & dixit eis. Nolite timere dico uobis quia ille quē que-
 ratis mortuum iam uiuit & uita hominum cum
 eo surrexit alle- **luia.** **P.** Laudate pueri d̄.
 Alleluia Epule mur maximis. **Coll.**

Atta alta alta. vi
 alta alta.
 Laudate pueri d̄.