pitch and partly an indication of phrase articulation that duplicates the beaming of note symbols; (5) the pause sign; (6) the pedal release sign; (7) the *staccatissimo* signs; and finally two suggestively graphic signs, (8) the spreadchord indication in bar 1, and (9) the decrescendo and crescendo signs.

From this it can be seen that staff notation is a complex multiple hybrid system with very low redundancy, partly technical and tablature-like, partly representational.

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## III. History of Western notation

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## 1. PLAINCHANT.

(i) Introduction. The earliest forms of plainchant notation, probably dating from the 9th century onwards, relied on signs generally known as 'neumes'. Such neumatic notation is clearly of great historical importance, for it stands at the beginning of the development that led to the notational forms in use today. Yet the time, place and circumstances in which neumes were first used are all disputed. Ever since medieval plainchant was revived in the 19th century the rhythmic interpretation of the melodies has been controversial, and the debate continues still. To a lesser extent the precise significance of certain signs (e.g. the oriscus, quilisma and liquescent neumes) and the possible use of chromatic notes in a basically diatonic system are also the subject of argument. All these areas of uncertainty stem from the fact that the notation represents only a few aspects of what was sung. So not only must modern scholars and performers interpret the signs committed to parchment by medieval scribes, they also have to elucidate the conditions that determined what should be represented in musical notation (and also what need not be notated).

The foundations for the systematic investigation of chant notations were laid principally by the monks of Solesmes, as part of the restoration of medieval chant for modern liturgical use. The facsimiles published in the Solesmes series Paléographie musicale (particularly 1st ser., ii-iii, 1891–2) and in Bannister's *Monumenti vaticani* (1913/*R*) are still of immense value. The volumes of Paléographie musicale are usually accompanied by notational studies, beside which the works of Wagner (1905, 2/1912) and Suñol (1925) are the most comprehensive. Subsequent detailed studies of many regional types of chant notation are cited below. Stäblein (1975) and Hourlier (1960) is a useful set of facsimiles with commentary.

Although the different styles of chant notation show agreement on the basic principles, they vary considerably from area to area and period to period; this variety reflects the circumstances (ecclesiastical-political, geographical, liturgical, educational) in which notation was used, and can, therefore, illuminate the history of ecclesiastical music in striking ways.

The following survey describes the principal characteristics of neumatic notation, before addressing the problem of its origins. The main regional styles of neumes are distinguished, in four historical phases: the period before the introduction of the staff; the staff notations of the 11th and 12th centuries; the less numerous forms of the 13th century onwards; and the notation of printed chant books. For each of the first three epochs a separate table of neume signs has been constructed (Tables 1, 2 and 3).

(*ii*) *Principal characteristics*. In general Latin usage the word *neuma* meant 'gesture, sign, movement of the hand'; in a musical sense it denoted a melodic element, often an untexted melisma. From the end of the 10th century,

TABLE 1: Neumes of the 10th-11th centuries

name	modern	French	St Gallen	North Spain	Toledo	Catalan	Bologna	Palaeo- Frankish	Breton	Messine	Aqui- tanian	Nonan- tolan
virga	0		1	/	1	1	1		/			1
punctum	•				• > c					۰, ۳		
pes	60	1	11	111	.10	d	1	1:	11	۲ ک <sup>ا</sup>	1	1
clivis (flexa)	•	μ	1	0 ^	1.1	A	r	۰:	л <del>.</del>	1 %	:	1
torculus	<i>.</i> •••	ſ	Л	5:	0	2	51	^	٩	A ~~	л	31,
porrectus	6,0	N	N	NK	~	N	$\checkmark$	r	$\sim$	V rs	:^	VV
scandicus	600	!	1	! J	1	Ben	/	7	1	! "ſ		!
climacus	•	<i>(</i> •.	1.	I. R	<i>\</i> ;	P=_	1:	ን	1 -	: *	<u>:</u>	1.,
strophici		m	979	эс II	دد	nat  [	If			11		
trigon		;;	**		сс 1	".		×				
oriscus		ч	5	5		N	ø		ר א	672	m	~
pressus		۳.				= %	/"			• cəļ	raj ,	1.
pes stratus		5	5						N		~	
salicus		15.	.2			2			·7			
quilisma		۳	ud	کې	w	2	14/		.r'	er	٢.	1:
epiphonus		J	U			J			5	S	J	
cephalicus		2	10	9		1	9		r	9	ŋ	p
ancus			Ø									2
axis		N	$\wedge$	٨	~	N	$\wedge$	Λ	Л	1	1	Λ

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TABLE 2: Neumes of the 11th-12th centuries

name	modern	square (Paris)	(West) German	Messine- German	Esztergom	Prague	Wrocław
virga	•	1	1		~		
punctum			•	~	*	*	•
pes	60	1	4	1	*	**	23
clivis (flexa)	•7	f.	M	*1	4	4	4
torculus	<i>?</i> ,	л	.11.	1	~1	+4	1
porrectus	<i>.</i> ,•	N	ţu	45	*0	4.	*1*+1*
scandicus	60	2	t	***	J.	***	***
climacus	· · · ·	14	14	ts.	Ť	****	***
epiphonus		U	٢				
cephalicus		n	p	*7			

however, the term was also used for the graphic signs used to represent melodies, typically designating a sign or group of signs attached to one particular syllable of text (see Atkinson, 1995; see also Wagner, 1905, 2/1912, p.15).

From this period onwards also survive tables that name the signs ('nomina notarum' or 'nomina neumarum'), with some variance of nomenclature depending on local traditions (see Huglo, 1954; Bautier-Regnier, 1964; Odenkirchen, 1993; Bernhard, 1997). Modern usage generally follows the practice of the tabula brevis found in a number of German sources. Several of the names appear to be of Greek origin or at least to affect a Greek derivation. The most common are as follows (see Tables 1, 2, and 3 for their melodic significance: step upwards, downwards etc.): virga (Lat.: 'rod', 'staff'); punctum (Lat.: 'point', 'dot'); tractulus (from Lat. trahere: 'to draw out'); pes (Lat.: 'foot') - also known as podatus (probably pseudo-Gk.); clivis (from Gk. klino: 'I bend', via Lat. clivus: 'slope') - also known as the flexa (Lat.: 'curve'); torculus (Lat.: 'screw of a wine-press'); porrectus (Lat.: 'stretched out'); scandicus (from Lat. scandere: 'to

ascend'); climacus (from Gk. klimax: 'ladder'); trigon (from Gk. trigonos, Lat. trigonus: 'triangular'); oriscus (possibly from Gk. horos: 'limit', or oriskos: 'little hill'); salicus (from Lat. salire: 'to leap'); quilisma (from Gk. kyliö: 'I roll', kylisma: 'a rolling').

The signs are usually classified as simple, compound, special (sometimes called 'ornamental') and liquescent. The simple neumes (most of those in Tables 1–3) consist of up to three notes and can be extended or combined to make compound neumes of four to six or even more notes. Some signs, which may be modified forms of the conventional neumes or additional letters, appear to indicate special features of performing practice (articulation, ornaments, agogic nuances etc.), but the manner of their performance is often unclear today.

A further distinction touches upon the different styles of writing neumes. In some areas signs representing two or more notes in a single stroke were preferred, while in others discrete dots or short strokes for each separate note were favoured. An example of (predominantly) stroke notation is early German notation, especially the sophisticated version practised at St Gallen. (Because of

## Notation, §III, 1(ii): Plainchant: Principal characteristics 87 TABLE 3: Neumes of the 13th–15th centuries

name	modern	Milan	Tuscany	Benevento	Cistercian	Klosterneu- burg	Esztergom	Prague
virga			1	1	4			
punctum			Þ	4	4	~	* 9	<b>A</b>
pes		2	1	1	لامر	~	S	~
clivis (flexa)	•7	2	7	71	m Ji	1	٦	7
torculus	<i>?</i> .	J	л	٦	r	~	л	n
porrectus	<i>,</i> ,	20	7	7	w N	v	r	v
scandicus	6.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	لر ا.	1	.¶	~	S	w
climacus	1	2	/	, 1	ſ.	1.	***	100
epiphonus		5	5	لو	J	2		
cephalicus		2	<i>∧</i> , †	74	\$	9	9	3
axis		1		Λ	Ν	1	Λ	$\wedge$

the hypothesis that sees the origin of stroke neumes in the accents of classical prosody, German and French notations and all types more or less closely related to them are often referred to as 'accent neumes'; this term will be avoided here.) Aquitaine is the best example of an area where a notation consisting primarily of points was used. Most areas, however, mixed extended strokes and dots, and the distinction has often been over-emphasized to buttress arguments concerning the origins of neumes (see below, \$1(iii)).

The virga and punctum each represent a single note. In stroke notations the virga was used for notes of relatively higher pitch, the punctum for relatively lower ones. Many other notational styles make only restricted use of the virga. Sometimes the punctum was drawn in elongated form, called the 'punctum planum' in older literature and the 'tractulus' in recent writings. Some manuscripts use both punctum and tractulus and appear to distinguish rhythmically between the two, the former being shorter, the latter longer. In the important early manuscripts from the Laon/Reims area (containing Messine neumes) the punctum takes the form of a small hook or barb, called the 'uncinus' in recent writings. In representing passages of simple recitation on a single note some sources prefer the *virga*, others the *punctum*.

The significance of most of the simple and compound neumes is more or less clear, but many of the special neumes are difficult to interpret; manuscripts vary to the extent in which they use these signs. The oriscus seldom appears alone over a syllable, but rather as part of a group of signs, or combined in special signs: virga strata (virga+oriscus; also known as gutturalis or franculus); pes stratus (pes+oriscus), pes quassus (oriscus+virga), salicus (punctum+oriscus+virga), pressus maior and minor (virga+oriscus+punctum and oriscus+punctum respectively, the final punctum being a lower note). Although in many contexts the oriscus seems to signify the repetition of the previous note, it has also been suggested that the neume may represent a non-diatonic note, or some agogic or articulatory peculiarity. The quilisma sign usually appears between two notes a major or minor 3rd apart, but it has also been interpreted as indicating a peculiarity of delivery, for example, a chromatic glissando, a turn or a rhythmic nuance. While the last note of the trigon is relatively lower, the relationship of the first two is unclear; they may represent

the same pitch, a semitone ascent or a non-diatonic interval. Some sources use *strophici*, which may signify a special type of articulation.

The signs known as 'liquescent' neumes are linked to liquid and sonant consonants and diphthongs in the text at a syllable change; they appear to involve a form of half vocalization of the note in question, passing from one syllable to the next. Two notes in ascending order, where the second is liquescent, are indicated by the *epiphonus*, and two notes in descending order with liquescence by the *cephalicus*.

Although many chant notations are recognizable at a glance, at least in a general way, their systematic investigation depends on the isolation of each sign in a particular notation and of all constituent elements within every neume, and the painstaking comparison of one source with another in the way these elements are used. Basic structural features include the direction of the script (axis) in ascending and descending strokes or groups of notes (diagonal, vertical etc.; see Tables 1, 2 and 3), and the way in which individual notes are combined in strokes or groups of signs. These are to be distinguished from calligraphic features such as the manner in which curved strokes or note-heads are drawn, or the degree of thickness of elements within a sign. The structural and the calligraphic features of a script vary according to time and place independently of each other.

Corbin (1977) introduced the concept of 'contact neumes', meaning a neume foreign to the area and predominant type of notation of a particular source: the neume may have been adopted by the notator of a manuscript as a result of contact with the foreign type. Corbin also used the term for a notation whose signs were derived from two or more earlier types; such a notation is here called 'mixed' or 'hybrid'.

(iii) Origins and earliest examples. Precisely when and where neumes were first used in the medieval West is not known. Isidore of Seville, writing in the middle of the 7th century, stated in his Etymologiae that melodies could not be written down (GerbertS, i, 20), and no concrete evidence exists from anywhere in the West for the use of notation before the Carolingian era. Necessity being the mother of invention, the reigns of the Frankish kings Pippin the Short (751-68) and Charlemagne (768-814) are thought to be the most likely period when a pressing need for plainchant notation could first have arisen. At this time the Franks made strenuous efforts to remodel their liturgical practices along Roman lines and, during the reign of Charlemagne, initiated a wide-ranging programme of educational reform, which might have included music writing. A positive view in this regard is taken, for example, by Levy (1987 etc.) who interprets passages in several 8th-century documents as referring to notation. For example, the decrees of the Council of Clovesho in England (747) refer to '[cantilenae] iuxta exemplar quod videlicet scriptum de Romana habemus ecclesia' ('[chants] according to the written exemplar, that which we have from the Roman Church': A.W. Haddan and W. Stubbs: Councils and Ecclesiastical Documents Relating to Great Britain and Ireland, Oxford, 1869-71, iii, 137); however it is not clear whether the written exemplar contained only chant texts or notation for them as well (see Hiley, 1993, p.297 for a negative view). Furthermore, Charlemagne's Admonitio generalis (789) decrees 'Et ut scolae legentium puerorum fiant psalmos

notas cantus compotum grammaticum per singula monasteria vel episcopia et libros catholicos bene emendate' ('... that schools cultivate reading by the boys: psalms, notes [notas], chant [cantus], the computus, grammar, in each monastery or bishop's school, and accurate versions of catholic books . . .'; MGH, Capitularia regum francorum, i. 1881, p.60); although the two words 'notas cantus' might be taken together to mean 'Inotational] signs of the chants', they more probably refer to two quite separate activities: 'writing, singing' (see Haas, 1996, p.152). None of the extant writings of the various scholars and advisors associated with Charlemagne's court mentions music notation and the earliest definite references to neumes are by Aurelian of Réôme (c850; CSM, xxi, 1975, chap.19). By the end of the 9th century Hucbald already knew of several different styles of notation (GerbertS, i, 117); his statement is confirmed by surviving examples.

The dating of the earliest examples is fraught with uncertainty and relies in large measure on palaeographical estimates of the date when the accompanying literary text was written. Three dozen or more specimens from the 9th century have been proposed; Table 4 is a list of many of them, a few of which are no doubt dated optimistically early. Most examples are single items in books that were never intended to contain more: several are notations of the *Exultet* chant in a sacramentary, or of the Genealogy of Matthew or Luke in an evangeliary. Often it is difficult in such cases to decide whether the neumes were added at a later date.

The earliest surviving complete chant books with notation - the graduals F-CHRm 47, LA 239 and CH-SGs 359 - date from the end of the 9th century or the beginning of the 10th; F-LA 266 is a fragment of a cantatorium slightly older than LA 239. VAL 407 may have been copied at the same scriptorium as the gradual CHRm 47. (The sacramentary-gradual AN 91, possibly from Angers and notated with Breton neumes - see PalMus, 1st ser., i, 1889, pl.XXII and p.148 - has also occasionally been dated to the 9th century, but is more probably of the 10th.) Ten palimpsest leaves of what appears to have been a notated 9th-century gradual survive in D-Mbs Clm 14735. The existence of several 9th-century books containing the texts of Mass chants unnotated graduals in other words - from important centres such as Corbie, Nivelles and Senlis (ed. R.-J. Hesbert: Antiphonale missarum sextuplex, Brussels, 1935) suggests that before the late 9th century such books were not normally provided with notation. On the other hand, two notated fragments dating from the late 9th century have survived from what appear to have been Office antiphoners, one with Breton neumes and one with German. These predate the earliest surviving complete notated antiphoners by a century. The possibility that Charlemagne promoted a notated archetype of the chant repertory, as argued by Levy, thus seems somewhat unlikely on chronological grounds. Although several centres were clearly versed in the practice of music notation well before the end of the 9th century (e.g. Regensburg in the first half of the century, Laon in the second, and St Amand), there is little sign of a concerted effort to establish complete notated repertories for Mass or Office during the 'first Carolingian renaissance'.

While Palaeo-Frankish, French and German, Breton, Laon and Spanish neumes are represented on Table 4,

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TABLE 4: 9th-century examples of neumes

			TABLE 4: 9th-century examples of neumes	
Source	Provenance	Notation	(Main contents) notated pieces	Facsimiles
<i>D-DÜl</i> D.1	Werden	Pal.	(sacramentary) Mass Proper chants	Jammers (1952) and (1953); Stäblein (1975), 107
F-Pn lat.2291	St Amand	Pal.	(sacramentary) Gk. Gloria	Handschin (1950), p.73; Jammers, <i>Tafeln</i> (1965), 129
F-VAL 148 (141)	St Amand	Pal.	Aurelian of Réôme: Musica disciplina	Jammers, Tafeln (1965), 131
F-VAL 150 (143)	St Amand	Pal.	(Lat. and Fr. Cantica virginis Eulaliae) practice penstrokes	_
F-VAL 337 (359, 325	) St Amand	Pal.	(Musica enchiriadis) 'Noannoeanne'	_
F-VAL 407 (389)	Brittany	Breton	gradual (bifolio)	—
GB-Ob Auct.F.4.26	Brittany	Breton	Office antiphoner (1 fol.)	Jammers, Tafeln (1965), 141
NL-Lu 25	Brittany	Breton	Office antiphoner (3 fols.)	PalMus, 1st ser., ii, pl.80
US-NYp 115	Landévennec	Breton	(gospels ['Harkness Gospels']) Eli eli from passion	Huglo (1986)
F-AUT S4 (5)	Flavigny	Fr.	(gospels) Genealogy	Jammers, Tafeln (1965), 107; Corbin (1977), pl.3
F-AUT S28 (24)	Autun	Fr.	(Cassian) sequence melodies	Stäblein (1961), 9
F-Pa 227	Vierzon	Fr.	(pontifical) Exultet	Corbin (1977), pl.5
F-Pn lat.11958	Corbie	Fr.	(gospels) Genealogy	Grove6, vii, 546
F-Psg 1190	Senlis	Fr.	(gospels) Genealogy	Bernard (1965), pl.ix
I-Rvat Reg.lat.215	Fleury	Fr.	(grammar and history) Gk. and Lat. Gloria and Credo	Bannister (1913), ii, pl.10
F-TOm 184; Pn lat.9430	Tours	Fr.	(sacramentary) Exultet	PalMus, 1st ser., iii, pl.181; Suñol (Fr. trans., 2/1935), pl.49
D-LEm Rep.I.93	?nr. Trier	Fr./Ger.	chant	Jammers, Studien, 1965, pp.4-5; Tafeln (1965), 11; Stäblein (1975), 111
F-SEL 1 (1093)	N. Italy	Fr./Ger.	(Mass lectionary) lessons	Corbin (1977), pl.2
I-Rvat Ottob.lat.313	?Tours	Fr./Ger.	(sacramentary) Exultet	Bannister (1913), i, p.2*; Corbin (1977), pl.1
A-Wn 958	N.E. France	Fr./Ger.	(sacramentary) preface	Beer (1913), pls.43-4
D-Bsb theol.lat.2 58	Lorsch	Ger.	(psalter) Carmina Boethii	Jammers, Studien, 1965, p.2; Tafeln, 1965, p.79
D-HEu Pal.lat.52	?Weissenburg	Ger.	Otfrid: Evangelienharmonie (Old High German)	Jammers, Tafeln, 1965, p.81
D-Mbs Clm 9543	Regensburg	Ger.	(Ambrose) alleluia prosula Psalle modulamina	Jammers, <i>Tafeln</i> , 1965, p.73; Möller, 1985-7
D-Mbs Clm 14314	Regensburg	Ger.	(Jerome) antiphon O pietatis Deus	Möller (1985-7)
D-Mbs Clm 29164/I	Regensburg	Ger.	(sacramentary fragment) Exultet	Gamber (1973), pl.3
D-Rp Cim.2	Regensburg	Ger.	(gospels) lesson	Gamber (1980), pl.11
I-Nn IV.G.68	St Gallen	Ger.	sacred and secular Lat. songs	Jammers (1967), 136
I-Rvat Pal.lat.485	Lorsch	Ger.	(misc. liturg.) Exultet	-
CH-SGs 242	S. Germany	Ger.	Sedulius: Carmen paschale	Steffens (1903), pl.49
A-Wn ser.nova 3645	S. Germany	Ger.	Office antiphoner (4 fols.)	Stäblein (1975), 183
E-Mn 10001	Toledo	Spanish	Liber misticus (fragment)	Brou (1952), pl.II
Toledo, Museo de San Vicente Fr.2	Toledo	Spanish	Liber misticus (fragment)	Suñol (Fr. trans. 2/1935), pl.95a-b
F-Pn lat.8093	Spain	Spanish	(Florilegium) hymn O mors omnivorax	-
F-LA 9	Laon	Laon	gradual (bifolio)	Hourlier (1988)
F-LA 107	Laon	Laon	antiphon Isti sunt angelica solidati	
F-LA 121	Laon	Laon	gradual (bifolio)	Hourlier (1988)
F-LA 266	Laon	Laon	cantatorium (bifolio)	Hourlier (1988); Jeffery (1982)

there are no surviving examples of 9th-century notation from Aquitaine, Italy or England.

No single explanation of the origins of neumatic notation has gained wholehearted acceptance. The prosodic accents of Alexandrine grammarians (see Laum, 1920 and 1928) have frequently been cited as the 'ancestors' of the neumes (Coussemaker, 1852; Pothier, 1880; Mocquereau in PalMus, 1st ser., i, 1889; Suñol, 1925; Cardine, 1968). According to this theory the acute accent gave rise to the virga, the grave accent to the *punctum* and the circumflex to the *clivis* or *flexa*. Yet, with the exception of Palaeo-Frankish neumes, the grave accent is hardly recognizable in most notations. Only one medieval treatise explains neumes in terms of accents, the anonymous Quid est cantus? (?11th century; I-Rvat Pal.lat.235; see Wagner, 1905, 2/1912, p.355), which contains such phrases as 'De accentibus toni oritur nota quae dicitur neuma ... Ex accentibus vero toni demonstratur in acuto et gravi et circumflexo'. Atkinson (1995) has convincingly argued that the author of the treatise had Palaeo-Frankish notation in mind. Nevertheless, while the prosodic accents were certainly known in Carolingian times, they can have suggested hardly more than some rudimentary elements of a system for music notation.

The notation of the earliest graduals mentioned above, from Brittany, Laon and St Gallen, is far from rudimentary; indeed, it is of a sophistication and complexity matched by few later chant books. According to one theory these complex signs are a representation of the gestures (Gk. neuma: 'gesture') made by the cantor while directing a performance, in other words, they derive from the practice of CHEIRONOMY (Huglo, RdM, 1963). The difficulties of this theory have been exposed by Hucke (1979). Cheironomy as practised in other (mostly non-Western) music cultures involves hand signs that denote exact pitches, something plainchant neumes manifestly have no intention of doing. To reconstruct a lost cheironomic practice from surviving notational signs and then to hypothesize that the signs derive from the cheironomy is inherently unsatisfactory, though the possibility should not be dismissed out of hand.

Floros (1970) proposed a wholesale adoption of Byzantine notational practice by Rome in the second half of the 7th century, claiming far-reaching correspondences between Palaeo-Byzantine notation of the Chartres type and Latin neumatic notation, including liquescent and special neumes and significative letters. But Floros's reconstruction of the early stages of Byzantine notation has been challenged (Haas, 1975), and the theory seems implausible on chronological grounds. Not until the 11th century was it customary to notate every syllable of Byzantine melodies; from the 9th century to the 11th notation was used only for particular points in the melody. And the Byzantine system developed in a quite different direction, as an interval notation, specifying intervals by signs as in a code, not representing them spatially on the page. (For further discussion of Byzantine notation see BYZANTINE CHANT, §3; on the development of the connection between vertical space on the page and a sense of higher and lower pitch in music see Duchez, 1979, and Sullivan, 1994.) However, the possibility that the concept of chant notation and some of its basic elements had a place in the interchanges between Carolingian and Byzantine church musicians of the late 8th century and

the early 9th should not be dismissed completely. (The system of eight modes is ascribable to these contacts.) The names of some neumes – of which, however, no records exist before the 12th century – appear to be Greek or pseudo-Greek.

As Treitler (1982, 1984, 1992) has repeatedly stressed, neumes must not be viewed as imperfect forerunners of staff notation. Had it been desired to represent exact pitches, the means to do so would have been found. (Exactly this was indeed accomplished by Hucbald, with a letter notation adapted from Boethius, and the authors of the *Enchiriadis* group of treatises, with dasian signs.) Neumes remind their reader of the essential features of a melody that has already been learnt. The singer retains in his or her memory the store of typical melodic gestures implied by the genre and mode of the piece. The neumes guide the adaptation of those turns of phrase to the liturgical text in question. (See Hucke, 1988, and, for rare evidence of the system 'under construction', Rankin, 1984.)

The point at which this written reinforcement of the singer's memory became necessary, and where the first steps were taken in the development of notation is uncertain. Levy (1987) has favoured a relatively early date and has argued for two distinct stages in the creation of a written 'Carolingian archetype', two archetypes in fact. A first attempt would have been made in Palaeo-Frankish neumes, a system that appears to have achieved only modest dissemination; the second would have been made with French-German notation.

Others have argued for a later date, at least for the notation of whole chant books (van der Werf, 1983; Hiley, 1993, p.371). The wide variety of notational styles and the small but persistent differences between versions of melodies in different areas suggest the independent writing down of the repertory from memory at different times and places, after the various notational styles were already established. The fact that the whole process had to be repeated after the introduction of staff notation, again with different results in different areas, also suggests that the dissemination of an archetype was neither expected nor practicable.

Several scholars, including Stäblein (1975, diagram on p.27), have hypothesized genealogical relationships among the different neume families. The more ancient neumatic notation is believed to be, the greater the room for speculation about the organic development of the different styles. Jammers, for example, associated the point notation of Aquitanian sources with Gallican chant, and regarded stroke neumes as typically Roman. Handschin (1950, pp.81ff) distinguished between pre-Carolingian practice and a "gregorianische" Neumensippe'. The sources known at present do not, however, seem to offer conclusive evidence to support such hypotheses.

Many questions, therefore, remain concerning the origins and early development of the neumatic notations. Under what circumstances could several different but equally mature types have developed by the end of the 9th century and yet more by the 11th? Is what they have in common the result of development from a common ancestor or did they evolve independently from a rather informally transmitted 'idea' of a written *aide-mémoire* for the singing-master? Is the appearance of fully notated graduals (with Mass chants) no sooner than the end of the 9th century deceptive (are earlier ones lost?), and why

Notation, §III, 1(iv)(a): Plainchant: Early French & German notations, 9th–11th c. 91

Vical ucpalma flore bu ficar ce druf pri pili patration pili 14. pili 14. pili 14. laba na multiplice bucque Ŕ undo mot domini

18. French neumes: gradual, early 11th century, from St Denis (F-Pm 384, f.10r)

& Rogamus te domme deus noster ut suscipitas animas eou defunctori pro quibus sanguinem tuum suditi recordare quia pului sumus « homo sicut Misencors fenum aresea. Quoniam non est in morte qui memor sit tu immferno autem quis con sitebitur tibi Etam.

19. English neumes: Office of the Dead, early 11th century, from St Augustine's Abbey, Canterbury (GB-Ob Bodley 572, f.27v)

are the earliest fully notated antiphoners (with Office chants) no older than the end of the 10th century?

## (iv) Early notations, 9th-11th centuries.

(a) French and German notation, including St Gallen and England. Despite differences in the direction of the script (from vertical in France and England to strongly inclined in south Germany) many basic similarities link the stroke notations used throughout France north of the Loire (except for Brittany and the archdiocese of Reims) and Germany.

French neumes (fig.18) were used within the area contained roughly by the four provinces of Lyons: the archbishoprics of Lyons, Rouen, Tours and Sens (Corbin, 1957). Numerous important manuscripts from such centres as St Denis, St Vaast, Dijon, Nevers, Cluny and Lyons use this notation. In the late 11th century the notation was also taken to south Italy and Sicily in the wake of the Norman conquest of those regions. The neumes typically ascend vertically and descend diagonally (the angle varies from place to place). However, this vertical direction is by no means a hard-and-fast rule in French notation, and in some sources (e.g. F-SOM 252 from St Omer: facs. in PalMus, 1st ser., iii, 1892, pl.184; and Pa 1169 from Autun: facs. in ibid., pl.183) the difference from German practice seems very slight. Other general differences from German practice are the angled form of both pes and clivis, and, from the 11th century, a tendency to add a hook or head to the upper left of the virga and pes and a foot to end of the clivis; occasional exceptions to these basic characteristics may, however, be found. The quilisma usually has three hooks; a few manuscripts, notably F-MOf H.159 from Dijon (on this source, see also §1(iv)(a)), use a descending quilisma as

well. The *trigon* is rarely encountered. (For facs. see PalMus, 1st ser., iii, 1892, pls.181–93; Bannister, 1913, pls.10–20, 39–40, 43–9; Suñol, 1925, Fr. trans., 2/1935, pp.230–44; Jammers, *Tafeln*, 1965, pls.23–6, 28; Stäblein, 1975, pls.3–5; Corbin, 1977, pls.1–5, 21–6, 28–9, 40–41.)

The same general type was used in England (fig.19; see Rankin, 1987), especially in Winchester, and was imported thence to Scandinavia. The direction of the English neumes is even more markedly vertical than most French sources, for example, in the *climacus* where the initial *virga* is slightly rounded at the top and the succeeding *puncta* descend vertically. The rounded *clivis* is also more characteristic of English than French sources. (For facs. see PalMus, 1st ser., iii, 1892, pls.178–80; Bannister, 1913, pls.41*b*–42; Suñol, 1925, Fr. trans., 2/1935, pp.283–97; Stäblein, 1975, pls.6–9; Corbin, 1977, pls.30–31.)

A small number of 11th-century manuscripts, mostly from Normandy, use a special form of *punctum* like a small hook (it resembles the *uncinus* of Messine notation, though it is not related to the latter) for the lower note of the semitone steps (B, E and the A below Bb). An equivalent form is sometimes found in Aquitanian neumes (where it is usually regarded as a type of *virga*). After the adoption of staff notation the sign still persisted, although strictly speaking superfluous, and was used even into the 13th century. Examples of it are found in England as well as Normandy (see Corbin, 1977, pl.22; Hiley, 1993, p.424). The Aquitanian form spread as far as Portugal (Corbin, 1952).

German neumatic notations have often been referred to en bloc as 'St Gallen' neumes (since the time when St Gallen was believed to have received its chant directly from Rome: by implication its notation was also considered to stand at the root of the German tradition). But St Gallen is only one eminent member within a more or less clearly differentiated group. The territory of German neumatic notation includes the whole German-speaking area, and, from the 11th century onwards, some parts of north Italy (Bobbio, Moggio, the Aosta valley, Aquileia), Besancon and Remiremont, Bohemia, Hungary, Poland and parts of Scandinavia. The direction of this notation is diagonal both ascending and descending; the style of script is flexible, perfected down to the tiniest details. Both *punctum* and *virga* are used for syllabic notes and the normal form of the pes is rounded. The notation is rich in special neumes. (For facs. see PalMus, 1st ser., iii, 1892, pls.110-12, 114, 116-17; Bannister, 1913, pls.2-9; Suñol, 1925, Fr. trans., 2/1935, pp.298-304; Jammers, Tafeln, 1965, pls.6, 9-12; Stäblein, 1975, pl.58; Corbin, 1977, pls.8-9, 11-12; Möller, 1990.)

The best-documented form of this script is the notation of St Gallen itself (fig.20). A number of sources have been published in facsimile and subjected to intensive study (CH-SGs 339, 359, 390–91, E 121 and D-BAs 6). The extraordinarily rich repertory of signs includes modified forms of the basic neumes together with additional *episemata* and significative letters to represent agogic nuances and other features. (For facs. see PalMus, 1st ser., iii, 1892, pls.108, 113, 115; Suñol, 1925, Fr. trans., 2/1935, pp.298–304; Jammers, *Tafeln*, 1965, pls.7–8; PalMus, 2nd ser., i, 2/1970; Stäblein, 1975, pls.59–60; Corbin, 1977, pls.6–7.)

Numerous similar notations can be found in sources dating from the 11th century in adjacent areas as well. Rarely, however, was more than a part of the full arsenal of signs employed, and the meaning of a few signs sometimes appears to have been modified (Engels, 1994).

Many regional types within the German group have not been analysed in the same depth as St Gallen notation. One of the most important is the Echternach type, documented from the 10th century onwards (facs. of *D*-*DS* 1946; ed. Staub and others, 1982; Möller, 1988); its characteristic feature is the *pressus minor* resembling a question mark.

(b) The Spanish peninsula. Neumes that in many ways are similar to the main French-German type were used in Spain before the Christian reconquest. There are, however, a number of distinctive signs: the scandicus proceeds upwards as a single line with loops; the pes, instead of making a simple angle, may swing upwards with a loop; and the torculus and porrectus also contain loops. This basic Spanish type was divided between two geographical areas. In northern Spain a roughly upright orientation (like that of French notation) prevailed, whereas the neumes in sources from Toledo (fig.21) are inclined drastically to the right, as it were impelling the line of music forwards. Since practically all the melodies for which these notations were chiefly used, those of the Mozarabic rite, have not survived in diastematic notation, some details of Spanish notation are not fully understood. Its age is also to some extent disputed, the possibility having been raised that it may antedate the 9th-century Frankish examples (Huglo, 1985). Thus estimates of the date of the León antiphoner (facs. in Antifonario visigótico, ed. L. Brou and J. Vives, 1953-9) vary from the 9th century to the 11th (see Mundó, 1965).

Spanish neumes were also used for some 'Gregorian' chant manuscripts, written after the Roman rite was brought into Spain in the 11th century (e.g. *Antiphonale silense*, ed. I. Fernández de la Cuesta, 1985). But the chief vehicle for the import of 'Gregorian' chant was Aquitanian notation.

In north-east Spain, in the area roughly corresponding to modern Catalonia, another type of notation similar to French became established, usually known as 'Catalan' notation.

(For discussion see esp. Suñol, 1925, Fr. trans., 2/1935, pp.311–82; also Bannister, 1913, pls.25–6; Jammers, *Tafeln*, 1965, pls.42–3; Stäblein, 1975, pls.86–8; Corbin, 1977, pls.37–9.)

(c) Italian notations. Many different stroke notations were used in north Italy (e.g. those of Asti, Vercelli, Novara, Civate, Mantua, Reggio d'Emilia and Verona), most of which await detailed investigation (on that of Brescia see Barezzani, 1981). They have in common the use of long chain-neumes and vigorous pen strokes. Some scripts have signs also found in a few French sources (angled *pes*, conjunct *climacus*), and the direction of the script also occasionally resembles French practice.

Special subtypes include the notation of Novalesa (fig.22). Its neumes include auxiliary forms with loops and rings, and a broad curve for the *clivis*; the script ascends vertically (see Suñol, 1925, Fr. trans., 2/1935, pp.186–97; Corbin, 1977, pp.165–71 and pl.36).

Bologna notation (fig.23; see also PalMus, 1st ser., xviii, 1969; Kurris, 1971) probably represents the oldest north Italian notation (Hourlier, 1960, pl.30; Corbin, 1977, p.155). It is marked by vigorous diagonal upstrokes, particularly for *resupini*; the script ascends diagonally, descending nearly vertically. Its repertory of signs is large, with numerous variant forms reflecting agogic or melodic features. The presence of both *punctum* and two forms of *tractulus*, horizontal and slanting (*planus/gravis*) for single lower notes, signs with rings, and a peculiar form of *quilisma* are notable.

The most independent type of north Italian notation was that used in the Benedictine abbey of Nonantola near Bologna; there are also sources from Torcello (fig.24) and Verona. A peculiarity of this notation is the way in which the first note of a group or melisma is connected graphically to the corresponding vowel of the text. Notes are represented mostly by individual virgae or puncta deployed diastematically. In both *climacus* and *scandicus* the puncta are arranged vertically, but the curved virga at the start of the *climacus* (and related neumes) makes the direction clear. The quilisma-note is represented by two dots. The script ascends diagonally and descends vertically (almost going backwards). (For facs. see PalMus, 1st ser., ii, 1891, pls.11-14; Suñol, 1925, Fr. trans., 2/1935, pp.197-9; Jammers, Tafeln, 1965, pl.32; Stäblein, 1975, pl.15.)

The adiastematic notations used in central Italy have hardly been studied at all (see Baroffio, 1990, note 30). They are not uniform; some are akin to north Italian stroke notations (e.g. *I-Rvat* lat.4770; *CHTd* N.2: facs. in PalMus, 1st ser., xiv, 1931, pls.44–5, see also p.251; *Rc* 1907: facs. in PalMus, 1st ser., ii, 1891, pl.7; *Lc* 606: facs. in PalMus, 1st ser., xiii, 1925/*R*, p.94, fig.10), others already show characteristics of 12th-century staff notations (right-angled *pes*, prolongation of horizontal elements). Beneventan features also appear in some scripts, 20. German neumes: cantatorium, c900, from St Gallen (CH-SGs 359, f.27r)

No sin with s. H. Diffula é grana. Of Offerencur. minor. CO Diffulae. DOMINICA. 11. opulur fion ecce. Exfion species decoris e Deus manifestee ve decorif e iul Congreg. fanccos eius qui or dinaue A: IS A . NIA TAT. e uf super sacrificia Att. Lastaciel fum. V. Stancel eray of Of a connettenf. CO hierulalem DOMINICA. III. Audece Indro femp. 1. 5% · ~ . Domine Superche

for example, the right-angled *clivis* and conjunct *scandicus*; their meaning, however, is not yet defined (e.g. *Rvat* lat.10646: facs. in Suñol, 1925, Fr. trans., 2/1935, p.209). Boe (1999) has discovered examples of adiastematic notation from Rome datable as early as around 1000, and also shown that French neumes as used at Bijon were used at the imperial abbey of Farfa in the mid-11th century.

Beneventan notation (fig.25) was used in the area corresponding roughly to the duchy of Benevento and its area of influence (including Benevento, Monte Cassino, Bari and the Dalmatian coast); it thus covered much the same territory as Beneventan literary script. (10th-century sources are listed in Corbin, 1977, p.143.) The repertory of signs is extremely rich (in PalMus, 1st ser., xv, 1937/R, Huglo listed 353 different neume forms, among them

mobeliaguirguummun orothe del plan: 13 otalarg un ogipaquen rubuarton mund uumptenorutra mirercorbin anndemine dey m' 2 Dartie mirercontium anum reicharbura de luraique hanua muciparu anum What cay commobala Camunur Improrum non mc quite Totte arpurte clandiairime domme população Norahanomner lucrimurproducimur pacuumural punderation occularique a mirimur uartair uchumd poteri uccipe droudout poraulua hagond Tucoreaum aun demine ubluences ambut hucaity tortaunad adgenant porcimur all landrmircht gr provation plaimur anupeastant lum Tub ucomyoqumen pucomnobit unilipter poraulumint domini drupdiculir clancharrame lumiublineners delicarrimmistal au bangnur sime

21. Toledan neumes: missal, 10th century, from Toledo (E-Tc 35.5, f.12v)

many varieties of liquescent signs). The *virga* has a graphic stress on the left. There are two types of *punctum*, one horizontal, the other slanting (*planum/grave*). The *clivis* also has two forms, one pointed (when approached from a lower note), the other right-angled (approached from the unison or a higher note). The *scandicus* is conjunct. The meaning of *tractuli* joined by a thin diagonal stroke is unclear ('inflatilia' with two notes, 'gradata' with three). Compound neumes, where long chains of notes are formed without lifting the pen from the parchment, are also prominent. The relative diastematy of this notation

later developed towards an increasingly exact pitchnotation (the *custos* was used even before the introduction of the staff). (For facs. see PalMus, 1st ser., xiv, 1931, xv, 1937/R, xx, 1983, and xxi, 1992, which are devoted to Beneventan sources.)

(d) Palaeo-Frankish notation. Palaeo-Frankish neumes (fig.26) were first discussed by Handschin (1950) and Jammers (1952; see also, *Tafeln*, 1965, pls.34–6); sources are surveyed by Hourlier and Huglo (1957). Their name is due to Handschin, who regarded them as the forerunner of accent neumes. The connotations of the

Notation, §III, 1(iv)(d): Plainchant: Early Palaeo-Frankish notations, 9th-11th c. 95 22. Novalesa neumes: troper, late 11th century, from Novalesa (GB-Ob Douce 222, f.103v) REAMINI SLAM te tuicht in mar 23. Bologna neumes: flyleaf of gradual, late 10th century, from ?Bologna (I-MOd O.I.13, f.B)

term are, however, problematic, and with hindsight the alternative designation 'St Amand notation' might be more appropriate (see Huglo, 1990, p.239). The notation appears to have been used in a restricted area including several important monasteries of Picardy and Hainault – Corbie, St Bertin, Anchin, Marchiennes – with the abbey of St Amand as its possible centre and an important outpost at Corvey on the Weser. They are last found at St Amand in the 12th century. The chief distinguishing feature of the notation is that the *pes* and *clivis* are represented by a single straight or slightly curved stroke; there is thus no *virga*. The *torculus* tends to be a simple semicircle. There is no distinction between *oriscus* and *quilisma*. In this notation, if anywhere, a strong connection seems to exist to the oratorical accents of the grammarians (Atkinson, 1995). Few sources are available in facsimile, so the degree of variance in neume forms and resemblances to other types of neumes cannot yet be assessed accurately. Since the two- and three-note neumes are sometimes 'split' into *puncta*, this notation has been reckoned among the 'rhythmic' types, perhaps the earliest such, implying that the distinction between slower and

24. Nonantolan neumes: missal, late 11th century, from Torcello (I-Bu 2679, f.12r)



faster delivery was present in the minds of chant scribes from the very beginning. (For a hypothetical line of development, tracing a link between Palaeo-Frankish neumes and the notations of Brittany, Aquitaine and Laon, see Hourlier and Huglo, 1957, p.218.)

(e) Breton notation. Breton notation (fig.27) is found chiefly in north-west France, but also in 10th- and 11thcentury sources from Pavia. Huglo's survey (AcM, 1963) shows a progressive retreat from the south-west (some features appear in early manuscripts from St Martial at Limoges), the Loire valley, Chartres, Maine, and Normandy south of the Seine. It was superseded by French notation in Angers by the turn of the millennium, but survived in the backwater of Brittany until the mid-12th century. Some 10th-century sources from southern England also use Breton notation (Rankin, 1984). With its obvious antiquity and simplicity, Huglo (op. cit., 82) and Stäblein (1975, p.30) thought it might once have been propagated widely throughout the Carolingian empire. As in Palaeo-Frankish notation (from which it may derive), the same sign is used where in other notations either an *oriscus* or a *quilisma* would be employed. Since the two- and three-note neumes are sometimes 'split' into *puncta*, this notation has been reckoned among the 'rhythmic' types (see Ménager, 1912). One of the principal sources, *F-CHRm* 47 (facs. in PalMus, 1st ser., ix, 1906), may be dated as early as the late 9th century and probably comes from Rennes. (For facs. see Bannister, 1913, pls.60–62; Suñol, 1925, Fr. trans., 2/1935, pp.256–9; Jammers, *Tafeln*, 1965, pls.40–41).

25. Beneventan neumes: missal, 10th–11th century, from Benevento

(I-BV 33, f.22v)

(f) Messine (Lorraine, Laon) notation. Messine notation (fig.28) was used in north-east France, in an area



26. Palaeo-Frankish neumes: missal, 9th century, from north-east France (F-Pn lat.17305, f.15v)

Notation, §III, 1(iv)(g): Plainchant: Early Aquitanian notations, 9th–11th centuries 97

27. Breton neumes: gradual, early 12th century, from Rennes (F-Pn lat.9439, f.107r)

including most of the archbishopric of Reims, bounded in the east by the Vosges, Eifel and Hunsrück. Towards the south and west it was not sharply detached from the area of French neumes. A special variant appeared as early as the 10th century near Lake Como (Sesini, 1932).

The earliest complete source to survive is *F-LA* 239 (facs. in PalMus, 1st ser., x, 1909), written in or near Laon about 930. Its repertory of signs is remarkably rich; each basic sign has variant forms (graphical variants, variants in the inner articulation of the sign, also significative letters). The basic sign for single notes is a small hook (*uncinus*). Characteristic signs include the *clivis* in the form of an Arabic '7' and the *cephalicus* in the form of an Arabic '9'. The direction of the script is diagonal ascending, vertical descending.

Similarly detailed studies of other manuscripts with Messine notation are not yet available. (Jeffery, 1982, and Hourlier, 1988, both discuss other very early examples; the main survey of sources is Hourlier, 1951. See also Lipphardt, 1955 and 1957; Arbogast, 1959; Cardine, 1968, Eng. trans., 1982; Corbin, 1977, pp.87–94. For facs. see PalMus 1st ser., iii, 1892, pls.154–65; Bannister, 1913, pls.55b–59b; Suñol, 1925, Fr. trans., 2/1935, p.248–55; Stäblein, 1975, pls.63–4.)

(g) Aquitanian notation. This notation (fig.29) was used over a wide area of south-west France, roughly corresponding to the Frankish province of Aquitania, and consists predominantly of discrete points. A *virga*, in the form of a point with a tail attached, is not found standing alone but as the final note of the *pes* or *scandicus*. The *torculus* is almost the only conjunct neume, formed of *punctum* plus *virga* joined to the final *punctum*. The *quilisma* is distinctive: after the initial *punctum* an almost vertical slash with initial hook is joined to the tail of the final *virga*. The earliest substantial source is the 10th-century miscellany from Limoges *F-Pn* lat.1240, whose principal scribes used Aquitanian notation, although some Breton and northern French neumes are also present.

Even before the end of the millennium scribes would use a dry-point line as a vertical orientation for music notation (the usual lines drawn for entering text would therefore be used alternately for text and music), usually for the 3rd above the final in authentic modes and the final in plagal modes (but F rather than E for mode 4). In some manuscripts a deliberate distinction seems to be made between dot and dash, possibly meaning shorter and longer notes respectively. In other sources the scribe seems simply to alternate the two, especially in descending climacus figures. In some sources, particularly F-Pn lat.903 (from St Yrieix; partial facs. in PalMus, 1st ser., xiii, 1925/R), alternative forms of the virga are used. A semicircular virga appears for the note on the lower step of a semitone (E, B etc.), a further type, the so-called virga cornu ('horned' virga), signifies the upper step of the semitone. Not dissimilar in shape to the latter is the virga strata (virga+oriscus). Even though the vertical placement of the notes is particularly exact in most sources from the mid-11th century onwards, clefs were not used, and

ommum or de mandauf celeftibus in luminubat. V Cumquiderez pedicatione file quos de convertir exhoeminories mabat de sider ro. ner be & Erat ergo que dammu lier profani ritus observationibus de dua endeir ca lumi ne ocu lo rumpri vata quamur de i cru es signum super oculos inpo nens invocato sepristinomine priseine reddi die san rati V Con fudo an quod sifummer crediders lumenamis su recipies invocato REAC

28. Messine neumes: Office of St Amand, 10th-11th century, from Reims (I-Rvat Reg. 466, f.102v)

29. Aquitanian neumes: gradual, 11th century, from St Michel-de-Gaillac (F-Pn lat.776, f.37r)

*custodes* but rarely, so that in the case of non-standard pieces the aid of the *virga* at the semitone is often useful for determining pitch. (The principal analysis of the notation is that of Ferretti in PalMus, xiii, 1925. For facs. see PalMus, 1st ser., ii, 1891, pls.83–103; Bannister, 1913, pls.63–4; Suñol, 1925, Fr. trans., 2/1935, pp.260–82; Jammers, *Tafeln*, 1965, pls.29–30; Stäblein, 1975, pls.31–5; Corbin, 1977, pls.19–20.)

(*h*) Significative letters. In some early sources letters are placed adjacent to the neumes, intended to clarify their interpretation with regard to pitch, rhythm, agogic nuance or dynamic (see Table 5). They are particularly common in a small group of 10th-century sources from St Gallen, Einsiedeln and Regensburg, and are also found in manuscripts from Laon and Chartres. Smits van Waesberghe (1938–42) counted 4156 letters in *CH-SGs* 359, 12,987 in *SGs* 390–91 (the Hartker Antiphoner) and 32,378 in *E* 121.

The use of significative letters diminished in the 11th century. Significative letters are described by Notker of St Gallen (d 912; ed. Froger, 1962; see also MGH, Scriptores, ii, 1829, p.103), who attributed their invention to one 'Romanus' (a choice of name no doubt intended to heighten their authority). According to Ekkehard IV of St Gallen (d 1036) the 'litterae alphabeti significativae' were added by Romanus to an authentic antiphoner of St Gregory, brought to the abbey from Pope Hadrian I. Consequently they are sometimes known as 'Romanian' or 'Romanus letters'. Some of the letters on Notker's list are commonly used but others are rare in chant sources. Notker's explanations (often rather fanciful) are usually devised as a mnemonic, where the significant letter is emphasized in the actual choice of words in the explanation; thus 'g' indicates 'ut in gutture gradatim garruletur genuine gratulatur'. Notker's explanations are summarized in Table 5, col.2. No corresponding explanation survives for the letters used in F-LA 239, but they were elucidated in PalMus, 1st ser., x (1909; see also Billecocq, 1978; and for sources from Chartres, see PalMus, 1st ser., xi, 1912). Some of the more common meanings are explained in Table 5, col.3. The two traditions differ as to the meaning of 'a' and 'f'.

(v) Pitch-specific notations, 11th-12th centuries

(a) Alphabetic notations and dasia signs. The need for pitch-specific signs was greater in theoretical texts, many of which contained music examples, than in the liturgical chant books. Treatises that dispense with music notation, such as Prologus in tonarium by Berno of Reichenau (d 1008: GerbertS, ii, 62-91), cite pitches by means of the note names of classical Greek theory (proslambanomenos. hypatē hypaton etc.). Other treatises, however, employ simpler systems based on sets of symbols or letters of the alphabet. The series of signs known as 'dasia' (or 'daseia': see Phillips, 1984, and Hebborn, 1995) was used in the important Enchiriadis group of treatises in the 9th century. Hermannus Contractus promoted another set of letters that specified the interval between one note and the next. Of all these, only alphabetic letters seem to have been used to notate whole chant books.

The alphabetization of the individual notes of the scale was thus at first a purely theoretical procedure and was intimately connected with the use of the monochord as a teaching instrument. Boethius ( $d \ c524$ ), the principal conduit for classical Greek music theory to the Middle Ages, demonstrated several features of the Greek systēma teleion (Greater Perfect System) by means of pitches produced on the monochord, and in one instance the notes of the diatonic scale through two octaves are marked off with the letters 'a' to 'p' (*De institutione musica*, iv.17).

Hucbald of St Amand, writing at the end of the 9th century, had already referred to the desirability of combining neumes with pitch-letters (*GerbertS*, i, 117–18; Babb, 1978, p.37; Traub, 1989, pp.62–5), although the actual pitch-letters he chose were not the a–p series but a selection from the 'Alypian' series transmitted by Boethius (*De institutione musica*, iv.3–4; see Babb, 1978, p.9). Hucbald's suggestion was not, however, taken up in this form in practical sources, although those with dual notation, such as the 'tonary' *F-MOf* H.159 (first half of the 11th century, from St Bénigne, Dijon), which also contains French neumes, do put his idea into practice. It is not clear whether the probable *spiritus movens* behind the copying of this manuscript, Guillaume de Dijon, knew

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Hucbald's work, or whether he was influenced by the late 10th-century treatise *Dialogus de musica* (see below).

Another series a-p, but this time representing modern c-c'', is also reported by Hucbald, and is known from several texts on the construction of organs and bells. The only known practical source utilizing this series is the Winchester manuscript with *voces organales GB-Ccc* 473 (late 10th- to mid-11th centuries), which attaches letters to the neumes of many sequences, making them among the earliest of all directly transcribable pieces (Holschneider, 1968 and 1978).

The dasia signs (fig.30) are known from three important texts of the 9th century and the early 10th, *Musica enchiriadis*, *Scolica enchiriadis* and *Commemoratio brevis de tonis et psalmis modulandis*, together with a number of others (ed. Schmid, 1981). The dasian series starts from a nucleus of four signs, representing the pitches of the four finals of Gregorian chant (D, E, F and G), which are then reversed and inverted to make further sets of four.



30. Dasia signs: 'Musica enchiriadis' (F-Pn lat.7211, f.10v)

Their intervallic disposition is so explained that the scale in ex.4 results (assigning the nucleus to modern d-g).

The practical significance of this scale is unclear (see Phillips, 1984), since repetition at the octave is not consistently possible. (For examples of polyphony with a total range of more than an octave, the full series of dasia signs is abandoned.) Possibly we are meant to understand

TABLE 5: Significative letters

Letter	St Gallen	Laon	Chartres	
а	[the chant] rises higher (altius) in pitch	increase (in length or emphasis) (augete)	-	
Ь	used in conjunction with another letter to mean 'very' ( <i>bene</i> ), i.e. that [the chant] rises or falls 'by a large interval', or that [a note] is to be held 'for a long time'	-	_	
с	to be performed rapidly (cito) or quickly (celeriter)	quickly (celeriter)	quickly (celeriter)	
d	[the chant] sinks lower (deprimatur)	-	lower (deprimatur)	
e or eq	[the note] sounds at the same pitch (equaliter)	same pitch (equaliter)	-	
f	to be performed with harsh or percussive attack (cum fragore seu frendore feriatur)	highest point of the phrase ( <i>fastigium</i> )	fragose? (see PalMus, 1st ser., xi)	
g	to be uttered by degrees in the throat (in gutture gradatim)		-	
b	-	low (humiliter)	low (humiliter)	
i	[the chant] moves downwards (iusum) or lower (inferius)	-	-	
k	signifies nothing to the Latin peoples, but for us Germans ( <i>alemannos</i> ) it stands in place of the Greek 'x', short for <i>klenche</i> , meaning with a ringing tone	_	-	
I	rise [in pitch] (levare)	rise (levare)	rise (levare)	
m	sing the melody moderately with restraint (mediocriter)	moderately ( <i>mediocriter</i> ) (appears to refer to either rhythm or interval)	-	
n, nt	_	join together (nectere)	join together (nectere)	
nl	_	_	do not ascend (non leves)	
0	the shape of the letter itself should be in the mouth (ore) of the singer	_	-	
p	driving forward (pressionem), with urgency (prensionem)	_	—	
9	-		q as in equaliter: same pitch	
r	with straight or forthright vibrato-less [tone] (rectitudinem vel rasuram crispationis)	_	_	
s	ascend (susum vel sursum scandere)	ascend (sursum)		
t	drag out (trahere), or hold (tenete)	hold (tenete)	hold (tenete)	
x	wait ( <i>expectare</i> ); there is no Latin word beginning with this letter	_	-	



that bb, f# and c# are available in all octaves, which would support the suggestion that some chants (principally offertories) 'modulate'.

In contrast to early Western notation, the system developed to notate Byzantine chant specified intervals between notes (see BYZANTINE CHANT, §3). The same principle was adopted by Hermannus Contractus (d 1054), using the following letters: 's' (semitonus) for the semitone; 't' (tonus) for the tone; 'ts' for the minor 3rd; 'tt' for the major 3rd; 'd' (diatessaron) for the perfect 4th; 'D' (diapente) for the perfect 5th; 'Ds' for the minor 6th; 'Dt' for the major 6th; and 'e' (equaliter) for the unison. A dot under the letter indicated descending motion.

The a-p series was adopted for use in *F-MOf* H.159 (fig.31) and a small group of manuscripts from Normandy and Norman England (Corbin, 1954; Santasuosso, 1989). All these sources are associated with GUILLAUME DE DIJON (William of Volpiano), the Italian abbot of St Bénigne, Dijon, who reformed most of the leading monasteries of Normandy in the early 11th century. *MOf* H.159 contains the complete corpus of Mass Proper chants in musical (not liturgical) order notated with both neumes and alphabetic letters in the series a-p (Guidonian A = a, Guidonian a = h, Guidonian aa = p; I = b<sup>t</sup>, *i* = b<sup>t</sup>; for the Guidonian scale, see below, ex.6). The scribes of this manuscript (see Hansen, 1974) attached special signs for liquescence, *oriscus* and *quilisma* to the letters.

A group of five special signs in F-MOf H.159 have occasioned much speculation (ex.5). They occur among the letters where a semitone step in the scale would normally be expected. According to one theory (see Gmelch, 1911) the signs represent quarter-tones or some Ex.5 Special signs in F-MOf H.159



other non-diatonic tones. Froger (1978) argued that the context does not necessitate the use of intervals smaller than a semitone, and there is no evidence from contemporary writings that such intervals were ever envisaged. The signs themselves seem not unlike the dasia. No fully convincing explanation for their use has yet been found.

The anonymous Dialogus de musica, written at the end of the 10th century in north Italy (see ODO, §3), proposes an alphabetic series not merely for pedagogical purposes but also as a way to notate a complete antiphoner:  $\Gamma$ indicates the lowest note, followed by the letters A-G then a-g for successive octaves, with 'aa' signifying the highest pitch. Only one fragment of such an antiphoner, however, has survived; the flyleaves of the Hereford noted breviary (GB-H P.9.vii) are from an older antiphoner with alphabetic, not neumatic notation (facs, in W.H. Frere, Bibliotheca musico-liturgica, i, London, 1901 [dated 1894]/R, pl.2). On these leaves, longer note groups in melismas are separated by dots. Guido of Arezzo also adopted this alphabetic system, extending the series to 'ee' (ex.6). (Santasuosso, 1989, is a study of alphabetic notation. For further facs. see Wagner, 1905, 2/1912, pp.222-9, 251-7; Bannister, 1913, pls.27-32; Suñol, 1925, Fr. trans., 2/1935, pp.392-404; Stäblein, 1975, pls.89-94.)

Ex.6 Pitch-letters in the Dialogus de musica and Guido of Arezzo (D. Hiley: Western Plainchant, p.395)



(b) The introduction of the staff. As early as the first period of medieval music notation, theoretical and pedagogical writings often specified the exact intervallic structure of music examples they cite. For this purpose, horizontal lines (varying in number) and/or letters and

tum à trram. & u nutria que ce l'ambiau fff fil to f to fff fil fo f to efsto l'ambiau f ef sfo de lift ode el fet f fff fil fe fo of the fil ff stefof. t ef sfo de lift ode el fet f fff fil fe fo of the fil ff stefof.

31. French neumes and alphabetic signs: gradual in tonal order, 11th century, from St Bénigne, Dijon (F-MOf H.159, f.30r)

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32. Roman staff notation: gradual, 1071, from S Cecilia in Trastevere (CH-CObodmer 74, f.80v)



symbols (e.g. dasia signs) were employed. These methods remained confined to theoretical texts, being too complicated for the notation of the entire contents of liturgical books. A historical turning-point was Guido of Arezzo's reform of musical notation (proposed in *Aliae regulae* [*Prologus in antiphonarium*], c1030; see Smits van Waesberghe, 1951). Based on the use of a staff, his system changed the whole relationship between writing and music in the greater part of Europe in a remarkably short space of time, and created the preconditions for developments of the greatest importance in Western music.

The rapid success of the reform may be attributed, on one level, to the simplicity and practicality of the system and to its incorporation of elements from previous systems of notation. The staff lines represent notes a 3rd apart, the intermediate notes being placed in the space between. The pitch of the lines is indicated by letter-clefs, letters of the traditional alphabet being set at the start of the respective line. In the 11th and 12th centuries the lines were normally scored into the parchment (dry-point lines), but those representing the upper note of a semitone step could be distinguished by coloured ink: red for the Fline, yellow for the c-line. Another of Guido's recommendations was the custos at the end of a staff, facilitating the progression to the next by indicating its first note. The notes themselves took the form of traditional neume shapes. Although the 'full' Guidonian system employed clefs, coloured lines and the custos together, in some cases not all these elements were adopted.

But it was not only the intrinsic merits of the reform that lay behind its Europe-wide success; the ecclesiasticalhistorical context was also favourable. When Guido explained his new ideas to Pope John XIX (1024-32), showing him how a previously unknown melody could be learnt from notation alone, Guido was commissioned to notate Roman liturgical books in staff notation - an obvious sign of papal approbation. The new 'Guidonian' system, therefore, also became 'Roman' notation, just at the beginning of an epoch when the role of the papacy and the relationship between Rome and the local Churches was changing. The dissemination of staff notation took place in the era of the crusades and the investiture struggle. Guidonian notation belonged to the arsenal of the reforms of Pope Gregory VII (1073-85); it could facilitate liturgical reform and preserve the unity of centralized uses.

Many scriptoria that adopted staff notation set their own traditional adiastematic neume shapes on the lines, which is probably what Guido himself had done. At the same time some of the previous allegiances (determined by geography or institutional connections) in respect of notational practice were relaxed or replaced. The scriptoria had three alternatives: to put their traditional neumes onto the staff; to import shapes from elsewhere along with the staff; or to create a new set of signs commensurate with the new system (naturally drawing upon previous experience).

The dissemination of staff notation across Europe did not proceed at a uniform rate. Examples in theoretical writings show that knowledge of the new notational ideal spread rapidly. But this does not necessarily mean that the transition was effected at the same time in notated liturgical books or the teaching of chant. Staff notation was introduced relatively early in central and northern Italy, including Rome: the gradual of S Cecilia in Trastevere of 1071 (CH-CObodmer 74: facs. in Lütolf, 1987; fig.32) is the oldest surviving complete codex with Guidonian notation. The transition also began in central France in the 11th century, soon followed by the Low Countries (St Trond) and Lorraine. During the 12th century, liturgical books in England, Sicily and Scandinavia (all of which were under Norman influence) were supplied with staff notation. In the areas of Aquitanian and Beneventan notation, which had already displayed diastematic characteristics in the previous notational epoch, the system was taken up either rather late (south Italy) or in strongly modified form (south France). Such features of 'classical' Guidonian notation as clefs and coloured lines were not regarded as essential. Some conservative Beneventan scriptoria retained their own diastematic but non-Guidonian notation as late as the 13th century (e.g. I-BV 21: facs. in Kelly, 1989, pl.12; the use of the custos is characteristic). Traditional Aquitanian notation had achieved full diastematy by the end of the 11th century, without recourse to the Guidonian system (see F-Pn lat.903: facs. in PalMus, 1st ser., xiii, 1925/R). In the area of German neumes staff notation was ignored for a long time; for example, in the scriptoria of the network of churches following the secular liturgical cursus (including most of the Augustinian canons) staff notation was adopted only towards the end of the 13th century. Many conservative centres continued to use adiastematic

neumes even beyond the 13th century. In Hungary Guidonian notation gained general acceptance in the last third of the 12th century, and in Bohemia and Poland during the 13th century.

The new Gregorian monastic orders also played their part in the process of assimilation of the reformed notation. The Camaldolese, Carthusians, Cistercians and Premonstratensians all chose to adopt the Guidonian system, which then spread throughout the monastic networks (in variant forms peculiar to the respective orders) across the whole of Europe. The more centralized the order, however, the less influence individual houses seem to have exerted on the scribal culture of their wider environment. In Germany, for example, the splendid Guidonian notation of the Cistercian books remained confined to the order itself. The Italian Camaldolese, on the other hand, supplied codices with staff notation to other churches.

(c) Central and southern Italy, including Rome and Benevento. Among the earliest centres to adopt the Guidonian reform were those of central Italy (from Perugia to the Lombard plain, Tuscany, Umbria, the Papal States, the secular churches, Camaldolese, Vallombrosians - the actual area requires more exact definition). Sources from this area usually adopt the full Guidonian system of coloured lines, clefs and custodes (Smits van Waesberghe, 1953, pp.53-6), with local variation in neume shapes. Although a systematic survey of all the material is still lacking, a number of sub-types in this notational area may be distinguished. Classic examples are those of the Camaldolese manuscripts in Lucca (see fig.33 from I-Lc 601; see also Lc 603, and 609 from S Maria di Pontetto: facs. in PalMus, 1st ser., ii, 1891, pls.34-5, and PalMus, 1st ser., ix, 1906; see also E-Tc 48.14: facs. in Smits van Waesberghe, 1953, tab.3; and I-Fl 247 and 158 - Camaldolese antiphoners of the 11th-12th centuries from Vallombrosa and Struma respectively) and those of Pistoia (I-PSc 119 and 121: facs. in Stäblein, 1975, pls.24-5). A feature of these scripts is the elongation of horizontal strokes; the liquescent virga resembles the Beneventan form. Closely related to these notations is that in the Arezzo orationale (I-ARc: facs, in PalMus, 1st ser., ii, 1891, pl.26), and, among others, a Benedictine gradual (I-Sc F.VI.15: facs. in Stäblein, 1975, pl.27). Compared with these, the finely

differentiated notation of Ravenna is recognisably independent in style (*I-Pc* 47 and *MOd* O.I.7: facs. in PalMus, 1st ser., ii, 1891, pl.37; Hourlier, 1960, pl.35; see also Baroffio, 1990). The small square note-heads (*virga*, *punctum*, *pes*) are reminiscent of north Italian point notations. The strong right tilt of the *virga* in the *climacus* and of the initial ascending element in the pointed *clivis* and *porrectus* are also characteristic. The half-cursive notation of the Benedictine gradual from Norcia, *I-Rv* C.52 (facs. in PalMus, 1st ser., ii, 1891, pl.33) represents another variant of central Italian notation; Beneventan influence is apparent in some neumes (e.g. the different elements in the *climacus*), as indeed it seems to be for the whole group of central Italian staff notations.

Beneventan and central Italian notations seem to be most clearly differentiated from each other in the form of the scandicus. In Beneventan and in reformed Guidonian 'Italo-Beneventan' staff notations from central Italy all three elements are conjunct, ending in a vertical virga. Central Italian notations also use the disjunct form (inherited from adiastematic Italian systems) for the scandicus: two puncta and a virga. But the conjunct scandicus is also present in these sources and further research is needed to establish whether this is the result of Beneventan influence or whether the guilismatic scandicus is intended. Central Italian notation is further characterized by the two forms of the clivis (pointed and rightangled), the tendency to build long chains of notes, the right-inclined virga at the start of the climacus and moderation in the use of special neumes. The direction of the script is diagonal both ascending and descending, but the angle differs within the area.

The Roman basilicas, perhaps as a result of Guido's audience with John XIX, adopted the staff system (red Fand yellow c-line, letter-clefs and *custos*) and combined it with neumes perhaps best described as simplified Beneventan (for the literary text, however, Caroline not Beneventan script was employed). Compared to the classical forms of Beneventan notation, most of the special neumes and the variant forms of the basic signs are absent. This is the notation used to record the Old Roman chant repertory (fig.32 from *CH-CObodmer* 74: facs. in Lütolf, 1987; see also *I-Rvat* lat.5319: facs. in MMMA, ii, frontispiece; *Rvat* S Pietro B.79: facs. in Baroffio and Kim, 1995). It was not, however, restricted to Rome but also

----mecum manum inparapfi de AL - L N- Still - L L us ofailime tradidit fi gno quemofai  $\frac{1}{1-\frac{1}{2}} - \frac{1}{2} \frac{1}$ 

33. Tuscan staff notation: antiphoner, early 12th century, from S Pietro, Puteoli (I-Lc 601, f.191r)

used in many churches in Lazio and Umbria (e.g. *I-CT* 12: facs. in PalMus, 1st ser., ii, 1891, pl.33; *MGG1*, iv, Tafel 34, pp.835–6) and was subsequently adopted for the earliest Franciscan chant books.

South Italian scriptoria in the area of Beneventan notation (Benevento, Monte Cassino, Bari; some of their manuscripts are sources of Old Beneventan chant) displayed no great enthusiasm for the Guidonian reform. Beneventan notation apparently developed towards perfect diastematy without any outside influence. At Monte Cassino this process accelerated under Abbot Desiderius in the second half of the 11th century (with the use of a staff without clefs or coloured lines but with *custos*), while coloured lines appeared in the 12th century (fig.34). Benevento itself was more conservative. At the end of the 12th century codices were still written without clefs, but with clear diastematy. (For facs. see Wagner, 1905, 2/1912, p.267; Kelly, 1989; PalMus, 1st ser., xv, 1937/*R*, and xxi, 1992; Cavallo and others, 1994.)

(d) North Italy, including Milan. The scriptoria of north Italy including the plain of Lombardy, with few exceptions, had adopted the Guidonian system by the beginning of the 12th century (fig.35). In some cases neumes of the previous local type were set on the staff without much alteration (e.g. at Nonantola and in the Como area where Messine-type neumes were used), but in most cases there was a modification under central Italian influence. The notation called Milanese exists only on staves; it seems to have been newly created at the time when the staff was introduced, drawing on elements of both Italian and Messine systems. In this period there was a general tendency in north Italian notations towards the use of discrete *puncta*, joined with fine lines.

Nonantolan neumes were combined with the full Guidonian system (Smits van Waesberghe, 1953, p.57), adopting a vertical ascending direction in the process (for facs. see Stäblein, 1975, pl.16; PalMus, 1st ser., ii, 1891, pls.15-18; G. Iversen, ed.: Corpus troporum, iv: Tropes de l'Agnus Dei, Stockholm, 1980, pls.XXX-XXXI), In Vercelli, by contrast, the notation had become diastematic by the 12th century, but can hardly be described as Guidonian, using only a custos (for facs. see Stäblein, 1975, pl.20; Iversen, op. cit., pls.XXVII-XXVIII; see also I-VCd 70 and 161). Characteristic of a large number of sources whose notation is generally closer to central Italian practice are: two types of *clivis*, pointed and rightangled; both disjunct and conjunct scandicus; right-facing virga at the start of the climacus. (For facs. see G. Iversen, ed.: Corpus troporum, vii: Tropes du Sanctus, Stockholm, 1990, pls.XXV-XXVI; MGG1, viii, Tafel 48 after p.1026; Stäblein, 1956, pl.7; PalMus, 1st ser., ii, 1891, pls.36, 37B.)

Milanese staff notation (fig.36) employed Guidonian coloured lines. Its characteristics include: conjunct scandicus, right-angled clivis, pes pointing right, no independent virga, tractuli for all single notes, climacus appearing as a clivis combined with a punctum, a tendency to construct long chains of notes, and an individual shape for torculus and porrectus. Like other notations of the region, neumes tended to be constructed out of points joined with thin lines. (Examples include GB-Lbl 34209: facs. in PalMus, 1st ser., v, 1896; and I-MZ c.14/77: facs. in PalMus, 1st ser., ii, 1891, pl.40; see also Stäblein, 1975, pl.21; Huglo and others, 1956, Tav.VII.)

(e) Normandy, Paris and other French centres, England and Sicily. The beautiful chant manuscripts with square notation produced in Paris workshops in the 13th century (and taken as models by the designers of the type for the Solesmes-Vatican books at the end of the 19th century and the beginning of the 20th) are often regarded as the outcome of a development initiated in Paris itself. But this is not the case. During the 12th century many centres in northern France, especially Normandy, and England began to make the *punctum* like a small square and used a small square head or foot on the virga, clivis and so on. They also adopted the Guidonian staff. Hesbert (1954) has traced this development within the manuscripts from the Norman abbey of Jumièges, and the same could be done for other centres. There are naturally some small differences between scriptoria: in Paris, for example, manuscripts from the late 12th century with staff notation have a *pes subbipunctus* with head turned right, instead of left as in 'classical' square notation of the 13th century (e.g. F-Psg 93, R 249 from St Victor, also Pn lat.17328 from St Corneille at Compiègne).

As already remarked, several 12th-century Norman and English manuscripts (e.g. *F-Pn* lat.10508 from St Evroult) use the special *punctum* at the semitone step. In Norman Sicily it seems that when the generation of scribes using neumatic notation had passed away, a form of proto-quadratic staff notation with mostly French but also one or two Italian elements (such as an Italian *pes*) was introduced. (See Suñol, 1925, Fr. trans., 2/1935, pp.145–7.)

No sources from these areas with staff notation are known to date from the 11th century, and many centres continued to use adiastematic neumes well into the 12th century. 12th-century manuscripts with staff notation survive from Angers and Fleury; Chelles, Paris, St Denis and St Maur-des-Fossés; the Norman monasteries of Fécamp, Jumièges and St Evroult; St Albans, Worcester and Downpatrick; Palermo and Catania; and Jerusalem. (For facs. see PalMus, 1st ser., ii, 1891, pls.43, 194; Bannister, 1913, pls.94, 96; Stäblein, 1975, pls.41, 65; Bernard, 1965, pls.xvii-xxvi; Bernard, 1974, pls.ix-x, xxxvii–xlv.)

(f) Messine (Metz, Lorraine, Laon) notation. The Guidonian staff spread to the area of Messine notation during the 12th century, co-existing briefly with notation in campo aperto. Even before the introduction of the staff, attempts at a more precise diastematy are visible. Scriptoria in this area, principally those in monastic centres, adapted the Guidonian system along their own lines, and little homogeneity can be observed. As in other parts of France, no need to apply all aspects of the system was felt, resulting in much variety in respect of coloured lines, custodes and letter-clefs. From the 13th century, however, Lorraine neumes regularly appear on staves of four red or black lines; some of the earliest preserved examples are those from the seat of the archbishopric in that area, Reims (see fig.37 from F-RSc 221; see also RSc 261: facs. in PalMus, 1st ser., iii, 1892, pl.167; and F-Pn lat.833 and 18008, both from the end of the 12th century).

The vocabulary of Messine neumes was somewhat simplified for the staff. The disjunct neume forms (used to signify agogic prolongation) receded, similarly the *virga* and most of the special neumes: the *quilisma* was replaced by a *scandicus*, the *oriscus* became a normal note or was simply omitted. Some scriptoria continued to use

au da ficua ob us fucas ca utudomo domine -17: 17 fretarge langetteoffera de mo i Car de plean bo nomin anna quom as hones eft anat confete au fantas fun aus fum, uful ua palma floto bra ficua co N molomm. Bannungandum ma o un fercofdias au 382 uthan aun au luna amile mint & confhauft aun fupo far marin lot atkono an and time. of

strophici, and of the liquescent neumes only the *cephalicus* and *epiphonus*. The basic single note remained the hook-shaped *punctum (uncinus)*, whose form varied from place to place. The representation of the *scandicus* and *climacus* continued to be variable. From the 12th century onwards the *climacus* tended to descend not vertically but diagonally to the right, perhaps under French or German influence. During this century the area of Messine notation gradually narrowed under French influence – *F-CA* 193 (olim 188) f.151*r*, from Cambrai (facs. in PalMus, 1st

ser., iii, 1892, pl.168B), for example, includes a French *pes* among Messine neumes). However, the Messine system exercised considerable influence on almost all notations in the German area that adopted staff notation. (*I-VEcap* CLXX, a noted breviary from Namur, early 13th century, is a classic example of Messine notation; for facs. see also Suñol, 1925, Fr. trans., 2/1935, p.254–5; Bannister, 1913, pls.55*b*–59*b*; PalMus, 1st ser., iii, 1892, pls.166–73; Hourlier, 1960, pl.19; Wagner, 1905, 2/1912, p.322). A complete codex with Messine staff notation

34. Beneventan staff notation:

Cassino (1-MC 546, f.49r)

gradual, 12th century, from Monte

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TIL, TAA, F.F. JT. hommbur bone uslurant Landa F. r.r.J. Jr. A. M.r.J. Jr. muter Benedicimit to Adora A Trading the state mate Glorificanus

(with some German features), the noted missal F-VN 759 of the 13th century, has appeared in facsimile (ed. Saulnier, 1995).

(g) French-Messine mixed notation. With the introduction of staff notation, scriptoria in central France developed their own variety of the system (in respect of coloured lines, clef letters and *custodes*; fig.38); among

manuscripts following Guidonian practice strictly are those of Nevers (e.g. F-Pn n.a.lat.1235-6; for facs. see PalMus, 1st ser., iii, 1892, pl.195B; Stäblein, 1956, pl.3; M. Huglo: 'Un nouveau prosaire nivernais (Paris, B.N. nouv.acq.lat.3126)', Ephemerides liturgicae, lxxi, 1957, pp.3-30; G. Iversen, ed.: Corpus troporum, iv: Tropes de l'Agnus Dei, Stockholm, 1980, pls.X-XI). The French-Messine system is an example of a 'hybrid' notation (Corbin, 1977, p.127). Most neumes are French, but beside the French clivis there is a right-angled clivis, which Corbin thought had been borrowed from Messine notation (although Italian influence, or perhaps even a musictheoretical source, cannot be ruled out entirely), and which is used where the first note of the clivis is at the same pitch as, or lower than, the preceding note. From the area east of Sens many such examples of French-Messine mixed notations may be found in this period (Corbin, 1977, map 2; manuscripts from Troyes, St Florentin, Auxerre, Vézelay, Dijon, Langres; for facs. see PalMus, 1st ser., iii, 1892, pl.198A; Bernard, 1965, pl.VI).

(h) Cistercian notation. The first great houses of the Cistercians (Clairvaux, Morimond and Pontigny) were



36. Milanese staff notation: antiphoner, 12th century, from Milan (I-Rvat lat.12932, f.5v)



<sup>37.</sup> Messine staff notation: missal, 12th century, from Reims (F-RSc 221, f.74v)

<sup>35.</sup> North Italian staff notation: troper, 12th century, from Brescia (I-Bu 2748, p.88)

- MN palma flore but sicut ce drus taba multiplica buit My fit 1 1 1-1-12 - - - fit. . . . . S Mappy - f- f- 1 ne mi fericozdiam tu am

38. Mixed French-Messine staff notation: gradual, 12th century, from Auxerre area (F-Pn lat.10511, f.185v)

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Clm 10075; facs. in Hourlier, 1960, pl.5), the abbey of St Jacques, Liège (F-Pe B-A: facs. in Bernard, 1974, pl.XVII), Maastricht (NL-DHk 76.F.3: facs, in MGG1, viii, Tafel 72 after col.1410). Stavelot (GB-Lbl 18031-2: facs, in PalMus, 1st ser., iii, 1892, pl.131), Trier (D-Ds 664: facs. in PalMus, 1st ser., iii, 1892, pl.132; D-TRs 2254: facs. in ibid., pl.133), Aachen (D-AAm 13: facs. in MGG1, v. Tafel 14 before col.321 and Haug, 1995, pl.93-9) and Utrecht (NL-Uu 417: facs. in Haug, 1995, pp.131-3; Uu 406: facs. in Loos, Downey and Steiner, 1997). Variant forms in the Mainz area use a vertical virga and a pes with a left-facing head. Such forms are also to be found in the Hildegard-Codex (Dendermonde, Benedictine Abbey, MS 9: facs. van Poucke, 1991) and a Koblenz missal (Wirzenborn Inr Montabaur], f.260r Kirchenarchiv: facs. in PalMus, 1st ser., iii, 1892, pl.137). Its influence may have reached further south, being felt in such books as the Zwiefalten antiphoner (D-KA 60, second scribe, f.260r), the gradual D-Au Öttingen-Wallersteinische Bibliothek, Maihingen I.2.4º.13, and an antiphoner fragment A-Ws C 1.

(j) South Germany, Klosterneuburg, Bamberg. Adiastematic notation was still dominant in south Germany during the 12th century. However, two types of staff notation developed under special circumstances, employed in comparatively few books. These types are referred to as 'south German' staff notation and 'Klosterneuburg' notation, respectively.

In a number of Benedictine scriptoria traditional south German neumes were placed on the staff, with differences in the use of clefs and coloured lines. Perhaps the oldest preserved source is the fragment of a monastic antiphoner from the end of the 11th century, A-LIs 623, with coloured lines and clef-pairs D-a, F-c or a-e. Important 12th-century sources include the Einsiedeln hymnal (CH-E 366 with red F-line, clef-pair F-c: facs. in Stäblein, 1975, pl.62), fragments from Hirsau (e.g. D-Sl Cod.fragm.53 with coloured lines, clefs on all lines, pes like an Arabic '3') and from Prüfening near Regensburg, affiliated to Hirsau, including the most extensive fragment, Mbs lat, 10086 (fig. 40) with red F- and green c-line, clefs a 5th apart (also from Prüfening come D-Mbs lat.23037, f.240 with clefs on all lines and a pes sometimes like an Arabic '3'; and Mbs Clm 13021 and 12027). Some sources with mostly south German neumes and scriptdirection appear to borrow from Messine practice cephalicus like an Arabic '9', right-pointing virga), for example, *D-Mbs* lat.9921 (f.40v, from Ottobeuren) and *D-KA* 60 (f.267r, from Zwiefalten). Closely related to these is the distinctive notation in 12th-century Bamberg sources. Its typical features are a right-leaning *virga* like an Arabic '1', an elongated *tractulus (punctum planum)*, both pointed and right-angled *clivis* forms, the latter with a long first element. (This type of *clivis* can already be seen in the late adiastematic notation of Bamberg sources, e.g. *D-BAs* 24 and 26, both of the 13th century.) Early examples include the 12th-century music theory manuscript *D-Mbs* Clm 14965b (f 30r; see Smirs van Waesberghe, 1969, p. 97)

and 26, both of the 13th century.) Early examples include the 12th-century music theory manuscript *D-Mbs* Clm 14965b (f.30r; see Smits van Waesberghe, 1969, p.97) and two fragments of monastic antiphoners from the turn of the 12th century (*A-KN* F8 and F19). This script evolved further in 13th-century sources such as *D-BAs* 25 (an antiphoner, first notation, f.2r) and 12 (gradual frag., f.8r).

Messine (Lorraine) features are predominant in Klosterneuburg notation, which also seems to be of south German Benedictine origin. Only the clivis and the special neumes (strophici, oriscus, virga strata, liquescents) are German. The direction of the script (ascending diagonally, descending vertically) is also Messine. The old, wavy quilisma is replaced by a form similar to the conjunct scandicus, while the normal form of the scandicus contains three Messine tractuli (uncini). Red F- and vellow c-lines are used consistently, all lines have clefs, but the custos is avoided. Sources include D-Mbs lat.9921 (ff.1. 54-7; see Smits van Waesberghe, 1969, p.111), from Ottobeuren, and three from Augsburg: A-Wn 573 (ff.19-25; see Berschin, 1975); D-Mbs lat.22025 (flyleaf); and D-W Gud.lat.334 (olim 4641). The most important group of completely preserved codices are those from the house of Augustinian canons at Klosterneuburg, including a gradual from the first third of the 12th century, A-Gu 807 (facs. in PalMus, 1st ser., xix, 1974) and the antiphoners from later in the century, for example, A-KN 1010, 1012 and 1013.

(k) Hungary. In the 12th century, when the Guidonian reform was carried out, Hungary was politically and ecclesiastically an independent kingdom. The notational reform may have been part of more general changes to the liturgy. Older Hungarian codices used south German neumes. At this time a deliberate campaign seems to have been carried out to create a new, reformed notation. Neumes of Messine and Italian origin were combined in a unique synthesis and set on the staff to create an independent notational type, known as 'Esztergom' or

presult your Benedicture R. Kauda ve do minum emnet geneef de collandarre e um om net pa puli. V upmam confirma raeft fuper nof mi ferreordia e sul euerral domini ma ner inerer

founded in the area in which the French-Messine hybrid notations were used. Cistercian notation used the staff from the very beginning (Marosszéki, 1952, p.31) and employed a mixture of French and Messine neumes. Beside the French *virga*, *pes*, *scandicus*, *climacus*, *clivis* and *cephalicus*, occur the Messine *clivis* and *porrectus*. No special neumes are used. While there is some regional variety among French Cistercian scriptoria in respect of the appearance of the staff, those in Italy, Germany and central Europe followed rather strict Guidonian practice. (For facs. of *F-Dm* 114, the 12th-century standard Cistercian compendium see *MGG1*, xiv, Tafel 73 after col.1344.)

(i) The Rhineland, Liège and the Low Countries. The Rhineland down to the Low Countries was one of the first areas to use staff notation, which was employed from the late 11th century onwards (staff notation was known in St Trond in 1099; see Smits van Waesberghe, 1969, p.27). Aachen (see fig.39 from *D-AAm* 13), Liège and Cologne seem to be among the earliest centres that adopted the system, with Utrecht, the Münster area, Mainz and even further south along the Rhine within the area of influence. Later, staff notation spread north-east, following, for example, the path of the Teutonic Knights. Many neume shapes were derived from earlier German forms, but the virga was provided with a small diamondshaped head (later to grow into the 'Hufnagel'). The first element of the pes sometimes became an upward-arching semicircle (bes à ergot), a form found in French or Messine scripts but previously rare in German sources. Special neumes and liquescents were also used. The direction of the script no longer slanted as much as it had done previously, but the script retained much of its rounded contours. Red and yellow lines for F and c respectively are common, the F-clef is often a simple point and the custos is absent from early manuscripts. Some sources appear to have borrowed signs from French or Messine notation, for example, the right-angled clivis or the epiphonus with a closed ring. Typical examples available in facsimile are from Ratingen or Gaesdonck (D-Mbs

Totus	peccata mut	noi misere rei	obis Agnus der q.	r pig sona nob
TE	ere unisea.	cht D, co	granas	
T	the dia	-019-7	are eliten	. 11
H to	mis sa ci	r. Oeo gre	St. 01. 4	AURU
0e	o gra	L'uas. I're	missa	eft-D'co
المرق	the Wit	Se of ences	dr.O co gra t	LAS TE THIS

39. Rhenish staff notation: gradual, 13th century, from Aachen (D-AAm 13, f.120v) 40. South German staff notation: gradual, 12th–13th century, from Prüfening (D-Mbs lat.10086, f.29)

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'Graner' notation (see fig.41 from H-Bn MNy 1, 13thcentury additions; see also Szendrei, 1988). Some remnants of the German neumes found in 12th-century sources gradually disappeared: only the supple appearance and careful calligraphy are reminiscent of the superseded German models. The characteristic features of the Esztergom notation are: tractulus rather than punctum; rightfacing pes; right-angled clivis; vertically descending climacus - often starting with a stereotyped wave like a double-note; and a conjunct scandicus (the last two after Italian models). Liquescent and other special signs are rare, 12th-century sources include H-Bn MNy 1 (first notation), HR-ŠIBf 10 (binding) and H-Bu U.Fr.1.m.214; from the 13th century date A-GÜ 1/43 and CZ-Ps DE.I.7; and SK-BRm EC Lad.3 and EL18 were copied in the early 14th century. TR-Itks 42 dates from around 1360 (facs., Szendrei, 1999).

(1) German-Messine mixed notations in Germany and central Europe. The change to staff notation was somewhat delayed in non-monastic scriptoria using German neumes. Only after the mid-13th century did sources with staff notation appear regularly east of Mainz or in the south German dioceses. Palaeographically these notations belong together, for they are all characterized by a fusion of German and Messine forms (in differing combinations, some an equal mix, others predominantly one or the other). The direction of the script is German (ascending and descending diagonally). The rhomboid single note typical of the whole region is a stylized evolution of the Messine *punctum* (*uncinus*). Since these developments were relatively late, the appearance of the notations was influenced by gothic scribal characteristics. Until the sources have been more comprehensively investigated it is not possible to say if these notations were disseminated initially from one centre or represent simultaneous and independent developments.

The earliest among the preserved sources is the Quedlinburg gradual *D-Bsb* 40078 (fig.42), from the start of the 13th century (sometimes dated to the end of the 12th; facs. in Haug, 1995, pp.109–12). The usual form for a single note is a *virga* with short stem and left-facing head (showing Messine influence on German form). The other neumes are of German or Messine type. There are coloured lines, but clefs are found only in the middle of lines for a change of register, not at the beginning. 13th-century manuscripts where there is also a balance between

purgani. Der nor e que hoder punmerfu mudu in po crederef. amonf fote r caligine TI Vala i sa s sa s sa presen fogregenes f redder gre forung frommer. Des nor & Topes Settimers fairlig morter per abiferes unever afterdur. KJechel ent nob pafor printe. nefe redume pfuister Omira circa nos rue pieratis dignatio. O intermadules dileccio caritates ut forun 74. 11/2 0. 17 relumerer filië readulate. Oberen nor que fole menue feire répussion inque pe abinferis refuerezeur. Des nos e de que serpeu e. Conos us dus silluminabiens. 7 nor Mummans mea moeterif menf. Dui à linenfraçio méauf. fugao fortera cuine :

41. Esztergom staff notation: 13th-century additions (H-Bn MNy 1, f.1r)

42. Mixed German-Messine staff notation: gradual, 12th–13th century, from Quedlinburg (D-Bsb 40078, f.245v)



German and Messine forms include those of Brunswick (see Härting, 1963) and Leipzig (e.g. *D-LEu* 391: facs. in Wagner, 1930; see also the 13th-century gradual CZ-Ps DF.I.8).

A number of notations more decidedly Messine in character are found from the mid-13th century onwards. The shape of the neumes is always articulated, consisting of rhomb for the noteheads connected by thick Gothic strokes. Examples are common in Austrian and Moravian sources (*A-Wn* 1925; Olomouc, Kapitulni Knihovna CO 3; *CZ-Bam* 6/11 and 19/27). Staff notation is known to have been introduced in the Moravian diocese (suffragan of Mainz until 1344) by Baldwin, Dean of Olomouc (*d* 1203; see Pokorný, 1980, p.42).

A mixed Messine-German staff notation was adopted in the south Polish diocese of Kraków, with sources dating as early as the 13th century (additions in *PL-Kk* 51), although the first complete sources are later. Messine elements predominate in a gradual of about 1300 from Wislica in the Kraków diocese (Kielce, Biblioteka Seminarium Duchownego RL 1), rather as in Moravian and Austrian sources just mentioned.

Besides the forms incorporating the stylized Messine rhomb, square note-heads were also used in some scriptoria of the region (see *A-KN* 629 and 1021, Olomouc, Kapitulni Knihovna CO 7). For example, the Benedictine scriptorium of Tyniec in southern Poland developed an individual notation combining square and rhomboid forms (e.g. *PL-Wn* Akc.10810; see Szendrei, 'Notacja liniowa', 1999).

Silesian notation, one of the most individual as well as best-documented notations of this area, is also dominated by Messine forms. The earliest sources already rely on the Messine *punctum (uncinus)* for the single note, and for the *pes* and *scandicus* when the interval of only a 2nd is involved (larger intervals end with a *virga*). There are no special neumes. This notation developed independently until the 16th century. Sources include the missal *CZ-Pnm* XIII.B.17 from the end of the 13th century (facs. in Hutter, 1926, Abb.VI-VII) and the following 14th-century manuscripts: *PL-WRu* Br.Mus.K.21; Ms.Muz.51322 (olim K.24); I.F.386; and R 503.

(m) The Messine notation of Prague. Apart from some monastic houses with affiliations outside Bohemia,

scriptoria of the Prague diocese used German neumes until staff notation was introduced by Vitus (*d* 1271), dean of Prague Cathedral. (German adiastematic neumes are still found in some Prague cathedral manuscripts as late as the early 14th century.) The manuscripts commissioned by Vitus, dating from between 1235 and 1253, use classical Messine forms, though the direction of the script is diagonal descending as well as ascending; the *custos* is absent (see fig.43 from *CZ-Pak* A 26-2, dated 1253; facs. in Spunar, 1957, pl.14c). The Premonstratensians probably played a part in this importation of Messine notation into Bohemia.

Codices written under Bishop Tobias (1279–96) witness its further assimilation. The following examples may be cited: CZ-Pak Cim.4 (dated 1235, ninth gathering: facs. in Spunar, 1957, pl.14b); Pak LXI.2 (Evangeliary of Bishop Tobias, dated 1293); Pak P.3 (Agenda of Bishop Tobias, 1294: facs. in Hutter, 1926, pls.IV–V); and Pu XIV.A.19. Both staffless German neumes and Messine staff notation are found in Pu IV.D.9 (Liber ordinarius S Viti, 13th–14th century).

(n) Cistercian and Premonstratensian notations in central Europe. Cistercian monasteries in central Europe used staff notation much earlier than other churches of the region, in fact from the time of their foundation in the 12th century. They used the French-Messine mixed notation as it had been developed in the Burgundian homeland of the order. This Cistercian system was more or less isolated from the traditions of its new environment, but gradually assimilated a few gothic features.

Premonstratensian notation in this area was less autonomous. The early houses of the order used Messine neumes, and the Premonstratensians were probably influential in introducing Messine staff notation to central Europe. Later sources with staff notation tended to assume characteristics of the local region. The first two notational layers of the troper CZ-Pak Cim.4 are probably Premonstratensian (see Vlhova, 1993). (See also the Polish Premonstratensian antiphoner of c1200, MS Arch.Norbertanek 1 in the convent library of Klasztor Norbertanek, Imbramowice, Poland: facs. in Miazga, 1984, p.235; and the German gradual from Arnstein, Trier diocese, D-DS 868, dated 1208–15: facs. in Miazga, 1979, p.120, facs.19). 110 Notation, §III, 1(vi)(a): Plainchant: Pitch-specific notations, 13th–16th centuries

43. Prague Messine staff notation: 'plenarium', dated 1253, from Prague (CZ-Pak A 26-2, f.73v)

(vi) Pitch-specific notations, 13th-16th centuries.

(a) Square notation. The development of square notation may have resulted from changes in the conception and the function of chant notation. The resolution of stroke notation into a series of discrete squares linked by thin lines suggests that chant was thought of more in terms of individual pitches than of lines and phrases, perhaps because of its role as static tenor beneath more mobile upper parts in polyphony. Because of the easier visibility of individual notes, it facilitated singing from a codex by a group of singers (the increasing size of manuscripts also reflects the trend towards singing from a book instead of from memory, at least in some centres). To notate in this way, with thick horizontal and hair-thin vertical strokes, required a different pen-hold from that used for writing texts. These new requirements and techniques led to the separation of cursive notation (for private musical jottings) from formal book notation (for official use).

The 'classical' square notation best known from Parisian books of the mid-13th century onwards was a development of the French notations used in northern France (especially the Ile de France) in the 12th century. Thus the *virga*, *pes* and *porrectus* have a left-facing head and the *clivis* has a thin initial upstroke; the direction of the script is vertical ascending and diagonal descending. The *scandicus* consists of a *punctum* combined with a *pes*, or a *pes* with a *virga*; and the two *puncta* of the *climacus* take the form of small rhombs. A four-line staff (sometimes red) is normal; the *custos* is usually absent, as it had been in the Paris area in the 12th century. (For facs. see PalMus, 1st ser., iii, 1892, pl.204A)

Square notation was adopted with greater or lesser promptness in wide areas of western and southern Europe, Britain and Scandinavia in the 13th century, occasionally (though not always) replacing a different notational type (e.g. in some centres where Messine notation had been used). Sometimes Parisian books were imitated fairly exactly, no doubt as a result of the general political, intellectual and cultural importance of Paris in the 13th century. But many regional centres assimilated square forms into their traditional notation (e.g. retaining the original direction of their script) without adopting all features of Parisian practice. Many of these local varieties await thorough investigation. Aquitanian scriptoria furnished many examples of this (Stäblein, 1975, p.161, pls.43*a*-*c*), so also the Carthusians (PalMus, 1st ser., ii, 1891, pl.105; iii, 1892, pl.206A) or northern French centres such as Beauvais (Bernard, 1965, pl.xix–xx; Stäblein, 1975, p.159, pls.41*a*-*b*). Thus old notational boundaries retained some of their effectiveness even in the 13th century. Milanese notation, presumably because of the different chant repertory it represented, remained individual throughout the Middle Ages.

Homogenizing and standardizing forces were nevertheless at work. Chant books could be commissioned from professional scriptoria and executed by scribes unfamiliar with local (provincial) idiosyncrasies. The new religious orders of the Franciscans, Dominicans and Augustinian hermits made square notation obligatory for their chant books (see Huglo, 1967; Van Dijk, 1963, ii, p.359); the correctoria of the Dominicans were written in Paris in the mid-13th century (PalMus, 1st ser., iii, 1892, pls.200A-B). When the Franciscan Pope Nicholas III (1277-80) ordered the destruction of older chant books in Rome and their replacement with new ones after the Franciscan model, square notation acquired the semi-official status of a 'Roman' notation. Thereafter it made rapid headway, especially in Italy, where Beneventan notation, for example, was shortly superseded. It also penetrated Germany and central Europe, mainly as the preserve of the religious orders.

(b) 'Gothic' notations. Gothic notations were not a new notational type but a change to the surface appearance of traditional neume shapes. Something similar had happened with the establishment of square notation, but whereas there the pen was held parallel to the line, in gothic style it remained diagonal. The horizontal and in particular the vertical down-strokes are strongly marked, the diagonal up-strokes fine. Whereas elegant, curved shapes were still common in the 13th century, by the 15th

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44. West German Gothic notation: gradual, 15th century, from the collegiate chapter of St Martin, Bonn (H-Bn Clmae 259, f.1v)



century thick, often uninterrupted chains of geometrically regular strokes were used. The basic shapes, however, are those of the German and central European notations already established in the 12th and 13th centuries, with the variety already described above, at least at first. The number of types diminished with time. Cistercian notation and that of Bamberg (except for its distinctive *clivis*) were eventually assimilated into the regional types with which they coexisted. Klosterneuburg notation disappeared after the 14th century. But the Esztergom notation in Hungary, and the notations of Prague and Silesia retained their independence. The rest of Germany and central Europe used either the (west) German or the mixed Messine-(east) German type. The former predominated as before

in the area from the Rhineland up to the Low Countries, the latter in eastern and southern Germany, Austria, Switzerland and Poland (the geographical boundaries have not been precisely determined).

The chief difference between the (west) German and the Messine lies their preference as regards in the sign for single notes. In the former both the *punctum* (as always, for lower notes) and the *virga* (for higher notes and recitation) are used. Here the head of the *virga* is shaped like a horseshoe nail (Ger. 'Hufnagel', hence the common designation of this notation as *Hufnagelschrift*; fig.44). On the other hand, the mixed Messine-German notation preferred the rhomb (lozenge, diamond, derived from the *uncinus*; fig.45) for single notes. In German notation the 112 Notation, §III, 1(vi)(b): Plainchant: Pitch-specific notations, 13th-16th centuries



rounded *clivis* with initial vertical shaft was preferred, in Messine-German the right-angled *clivis*. The westerly scriptoria cultivated more rounded shapes and placed less emphasis on the individual note-head, and liquescents – the *strophici*, even the *quilisma* – are still to be found. (PalMus, 1st ser., iii, 1892, pl.141; Hourlier, 1960, pl.7.) Messine-German notation appears to place more emphasis on the individual note. Liquescents remained but other special neumes disappeared.

In neither family is uniformity to be expected; for example, D-W 528, from Minden, is basically Messine-German but has a *virga* with its head on the right-hand side – a kind of compromise between *Hufnagel* and Messine rhomb (Haug, 1995, pp.156–60). Some Messine-German sources occasionally (but inconsistently) use a *virga* for a single higher note (e.g. San Cándido Stiftsbibliothek, VII a 7: facs. in Haug, 1995, pp.129–30; *D-Mu* 2° 156: facs. in Hiley, 1996).

Within the general areas of dissemination of the types mentioned above, notational 'islands' are discernible, where a tradition other than the prevailing regional system was employed. The Benedictines of the Abbey of St George in Prague, no doubt because of their connection with Hirsau in the Black Forest, used German staff notation in the very heartland of Prague-Messine notation. The Order of Teutonic Knights brought (west) German notation (together with the Dominican liturgy) into the north-eastern areas of Europe they colonized (e.g. the 14th-century antiphoner *PL-PE* L 19; see also Szendrei, 1994, and 'Notacja liniowa', 1999).

Professional workshops producing manuscripts to order were responsible for a gradual simplification and standardization of the notational picture, although some local scriptoria continued to produce codices of more individual appearance. In the late Middle Ages the number of sources made for private purposes (as informal music notebooks and school music books) increased. The appearance of the cursive notations in this class of music manuscripts naturally differs radically from the highly artistic books for official use.

(c) Esztergom (Gran), Prague and Wrocław (Breslau). Three larger enclaves of independent notations persisted to the end of the Middle Ages in Hungary, Bohemia and Silesia, respectively.

Esztergom notation was uniquely long lived. Although losing ground fractionally to Messine-German notation, it retained all its essential characteristics, its arsenal of signs and typical direction, even beyond the Middle Ages (fig.46; survey with facs. in Szendrei, 1988). In surface appearance it acquired some gothic features. In a few scriptoria a new mixed notation incorporating some Messine-German elements was practised for luxury manuscripts (for facs. see Szendrei, 1990–93).

45. Messine-German Gothic notation: gradual, dated 1360, from

Moosburg (D-Mu 2° 156, f.114r)

Prague notation continued to develop during the 14th and 15th centuries. After Prague became canonically independent of Mainz in 1344, its status as seat of the archbishopric, the imperial power and the university demanded the production of numerous splendid presentation codices; in such books the way in which every note is represented by a rhomb, joined by hair-thin lines (in traditional Messine combinations) is particularly noticeable (fig.47). When Olomouc became suffragan of Prague the local notation disappeared in favour of the latter's notation, which also spread beyond the borders of Bohemia and Moravia, influencing practice in Kraków in the 14th century and other areas in the 15th, during the time of the Hussite ascendency. (For facs. see Hutter, 1930, and Plocek, 1973.)

In Silesia the notation of Wrocław (Breslau) attained its fullest individuality in the second half of the 15th century (fig.48). Here, too, rhombs were used for *pes* and *scandicus* with intervals of a 2nd, and they predominate as component elements in other neumes as well, joined by lines of varying slenderness. (For facs. see Miazga, 1984, pls.71, 81, 91; *Musica Medii Aevi*, iv, 1973, pls.16–17; ibid., viii, 1991, pls.11–12.)

(vii) Printed notations. Early printed chant sources have been surveyed by Riemann (1896) and Molitor (1904). They precede the earliest printed polyphonic music by over two decades. Some 270 books with printed music were published by 1500 (King, 1964, p.8), almost all liturgical. Some of the earliest examples are in missals where only some of the priest's chants are provided with music. The first known book of this kind is the missal printed in Rome in 1476 by Ulrich Han from Ingolstadt. The earliest choirbook is even older, a gradual probably printed in Konstanz in 1473. The gradual uses 'gothic' notation with a pleasing repertory of shapes, even including the distropha and custos. The Roman print uses square notation. Printers displayed considerable ingenuity in devising appropriate note-forms, with German printers generally approaching the flexibility of handwritten neumes more successfully than their Latin counterparts,





46. Later Esztergom notation: gradual fragment, 15th century, of the Paulite Order (H-Ba K 484, f.1r)

who often relied on the square and lozenge, or even the square alone.

Even before the advent of music printing, plainchant notations occasionally adopted features of mensural notation. Manuscripts with signs such as the *semibrevis* and *minima* are not uncommon in the 16th century in the south of the German-speaking regions. These were not used for traditional melodies but for new compositions, particularly melodies for the Mass Ordinary (e.g. the pieces in *CH-SGs* 546: ed. Marxer, 1908; also Sigl, 1911). Mensural notational signs were then taken up in some printed chant books; for example, books printed in Venice by Francis de Bruges regularly include the mensural Credo known as the 'Credo cardinale' (Tack, 1960, p.50).

Mensural signs were also adopted in Giovanni Guidetti's influential *Directorium chori* (1582), which includes the simple tones of the Mass and Office. There is a fourfold distinction between lozenge (*semibrevis*, short), square (*brevis*), square surmounted by an arc, and square with *fermata* (longest value), in the ratio 1:2:3:4 (see ex.7). A 'dotted rhythm' is always indicated by using 3

Ex.7 Note shapes in Guidetti (D. Hiley: Western Plainchant, 616)

- 2 3 4
- \* = =

with 1. Such shapes were then widely adopted in later books, particularly for the notation of the new chants produced in profusion in France as part of the 'neo-Gallican' ecclesiastical movement.

See Plainchant, \$9(i); Plain-chant musical; and Neo-Gallican chant.

In printed chant books of the 19th century various styles were used, which were derived and developed from earlier printing practice, often incorporating mensural features. The melodies thus notated, when not actually new compositions, were the result of much revision and recasting, whose principal monument was the gradual in the 'Medicean edition' (1614–15) composed by Felice Anerio and Francesco Soriano. When the Benedictines of Solesmes made new editions of the chant melodies in their medieval form they decided to develop a new font incorporating as many features as possible of the 'classical' quadratic notation of the 13th century, but also including a sign for the *quilisma*, which by the 13th century was no longer in use. In the Solesmes *Antiphonale monasticum* (Tournai, 1935) a sign for the *oriscus* was introduced. More recent books (*Liber hymnarius cum invitatoriis & aliquibus responsoriis*, Solesmes, 1983) have developed further signs to represent other features of the early chant manuscripts (a greater variety of liquescent signs, *apostropha, pes* with light first note etc.: see *Liber hymnarius*, p.xii).

Research at Solesmes had made it clear that the notation of early St Gallen and Laon manuscripts was particularly rich in rhythmic detail. The question as to whether such indications should be represented in the Vatican editions caused a rift in the commission appointed to prepare the new books. Pothier, the chairman of the commission, saw them as a local and temporary phenomenon that need not become part of an official edition with claims to universal validity (see Pothier, 1880; David, 1927; Bescond, 1972). Eventually two parallel editions appeared, that of the Vatican was 'plain', that of Solesmes contained supplementary horizontal bars (known as 'episemata') over certain notes and dots after others, to indicate lengthening. The Solesmes version became particularly well known after the publication of the compendium Liber usualis (Solesmes, 1921), and was propagated in numerous explanations of the 'Solesmes method' (Suñol, 1905 etc.; Gajard, 1951) as well as in Mocquereau's weighty treatise, Le nombre musical (1908-27).

An interesting development has been the re-publication by the Benedictines of Solesmes of older chant editions with the addition of hand-drawn reproductions of the neumes of *F-LA* 239, *CH-SGs* 359, *E* 121 and so on in the *Graduale triplex* and *Offertoriale triplex*. The purpose

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47. Later Prague notation: gradual, c1470, from Hradec Králové (CZ-HK 40 (II A 2), f.8v)

48. Later Wrocław notation:

1194. f.105r)

gradual, dated 1429, from St Mary

Magdalene, Wrocław (PL-WRu

of such editions is to enable performers to take the notation of the early sources into account. Starting with the writings of Cardine (esp. 1968), a large body of literature has been created to support theories of chant performance based on details of these neumatic notations (see PERFORMING PRACTICE, §II, 2(i)).

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di - cat

(b) hypothetical rhythmic transcription of (a)

- di

cat

he - ne

- Graduale triplex, seu Graduale romanum Pauli PP. VI cura recognitum & rhythimicis signis a Solesmensibus monachis
- Ex.8 Neume patterns in Aquitanian/Compostelan polyphony (after Stäblein, 1963; Karp, 1992)

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(a) Ad superni regis (contrafactum of Noster cetus) E-SC Codex Calixtinus, f.214v

im - pe -

····

do

- m

mi

do

ornatum, neumis laudunensibus (cod. 239) et sangallensibus (cod. San Gallensis 359 et Einsidlensis 121) nunc auctum (Solesmes, 1979)

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Notation, §III, 2(i): Polyphony and secular monophony to c1260

SOURCES, MS, SIII.

rhythmic transcription.

Offertoriale triplex cum versiculis (Solesmes, 1985) [with neumes of *F-LA* 239 and *E* 121]
POLYPHONY AND SECULAR MONOPHONY TO c1260.

This section is devoted almost exclusively to the notation

of rhythm, an emphasis borne out by the theoretical

sources from later in this period. Apart from the

Aquitanian manuscripts mentioned below, which display

the neume dialect particular to this region, the music is

notated in the square notation of plainchant (see above.

§III, 1(vi)), which originally had no rhythmic significance,

but acquired durational values for use in polyphony.

Detailed descriptions of the sources of early polyphony

discussed below may be found in SOURCES, MS, SIV;

manuscripts containing secular monophony are treated in

(i) Neume patterns in Aquitanian polyphony,

c1100-c1200. Several conspicuous features emerge in

the notation of Aquitanian polyphony, including the

Codex Calixtinus (E-SC, copied in central France

c1150-80; see Huglo, 1995). One is a predilection for

stronger consonance at the ends of neume-against-neume

or note-against-neume units; another is the use of

patterned melismas (e.g. strings of two- or three-note

neumes). Stäblein (1963) and Karp (1992) proposed that

rhythmic configurations akin to those of the later modal

system may be present. Ex.8 is an example of

Aquitanian/Compostelan polyphony with a hypothetical

The preference for consonance at the ends of neumes is

particularly striking in texted sections of conductus,

versus and Benedicanus settings, where it belies the

T. F. T. F.

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