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From St. Martial to Notre Dame*

By WILLI APEL

SOMETIME during the second half of the 12th century a development took place that led to one of the most fundamental concepts of Western music: meter and metrical rhythm. The final result stands clearly before us in the organa tripla and quadrupla of Perotinus, works that were composed about 1200. The opposite end of the line of evolution is indicated by the organa dupla of St. Martial, written in the mid-12th century. All indications support the theory that these organa are in free rhythm, lacking fixed time values and rhythmic patterns. Thus within a relatively short span of time the style of rhythm changed into its very opposite, from the free, "Gregorian" rhythm of St. Martial into the rigid modal rhythm of Notre Dame.

While the organa of Perotinus represent the complete ascendancy of modal rhythm, its first appearance is in the works of his predecessor, Leoninus. Leoninus created the standard form of the Parisian organa, a form based on the distinction between the syllabic and the melismatic sections in the Gregorian melodies used in the tenor. The passages in syllabic style (or group style: that is, having one or a few notes to each syllable) were transformed into tenor sections consisting of single prolonged notes, each of which becomes a "pedal point" for an extended complex of notes, often 50 to 100, in the upper part. The melismatic passages (often with ten, twenty, or more notes to a syllable), on the other hand, were transformed into tenor passages of a considerably more continuous design and motion, with the corresponding passage of the duplum showing only twice to four times as many notes as are found in the tenor. These sections, the so-called clausulae, are the earliest known examples of polyphonic composition in strict modal rhythm. The tenor usually proceeds in irregular groups (*ordines*) of the fifth mode (*longae* or *duplex longae*), while the duplum moves in the faster rhythm of the first mode (alternation of *longae* and *breves*). Thus Leoninus must be credited with the introduction into polyphonic composition of strict meter and regular rhythm. The remaining question is whether, or to what extent, this novel principle is also embodied in the "pedal point" sections (usually called organal sections) of his organa. It is this question which forms the topic of the present study.

While the notation of the clausula sections in Leoninus' organa is clear and simple, that of the organal sections presents difficulties that have not been satisfactorily solved. The notational characters used in these sections are essentially the same as are encountered in the clausula sections and in modal notation in general, that is, ligatures, conjuncturas, and single notes. The difference lies in the highly irregular arrangement

*This article is the result of studies made in preparation of the fourth, revised edition of *The Notation of Polyphonic Music*. I am grateful to the editors of the *Journal* for giving me this opportunity to present the topic in much greater detail than is possible in the book. Abbreviations: *OHM, Oxford History of Music; ZMW, Zeitschrift für Musikwissenschaft; AMW, Archiv für Musikwissenschaft; CS,* Coussemaker, *Scriptorum de musica medii ævi.*

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and combination of these signs, as opposed to the regular grouping of ligatures (*e.g.*, *3 2 2 2* . . . for the first mode) encountered in modal notation. Another striking difference is the fairly extended use of many-note ligatures and, particularly, conjuncturas, the latter often with as many as ten notes in descending motion. In the clausula sections the number of notes combined into a single graph rarely goes beyond four (*ligatura quaternaria*). The accompanying reproduction, showing the organum duplum *Viderunt omnes*, illustrates the chief traits of form, style, and notation encountered in this period. The short clausula section, "om," appears at the end of the second brace.

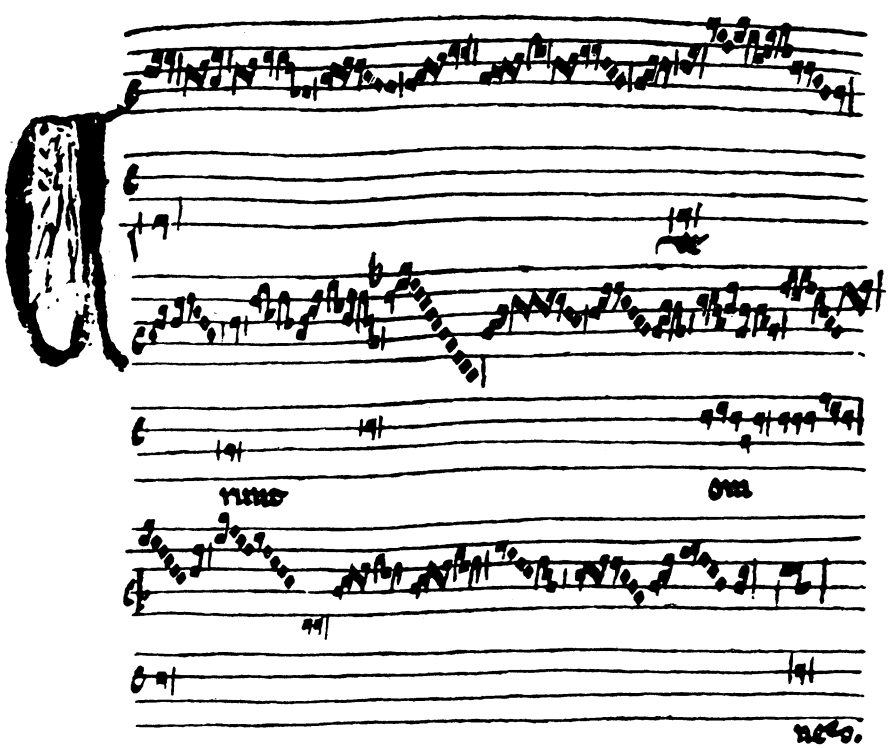
Turning now to our main question, that is, the rhythmic interpretation of the organal sections, it appears that the following varieties of rhythmic style must be admitted as possibilities:

A. Free Rhythm. The notes of the duplum are all essentially isochronous, admitting, of course, a certain flexibility of tempo and occasional lengthening of notes, particularly at the end of a phrase. This style is similar to the Solesmes method of interpreting Gregorian chant, although the specific principles of this method (*ictus*, etc.) cannot, of course, be applied, since they have no historical foundation.

B. Measured Rhythm. The notes

Organum duplum *Viderunt omnes*
W_1, f. 21^r

Ex. 1



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of the upper part have definite time values, a short (*brevis*) and a long (*longa*) of double or triple length, which alternate freely without falling into regular measures. This style is similar to the so-called "mensuralist" interpretation of Gregorian chant which has been advocated by P. Wagner, Dom Jeannin, and others.
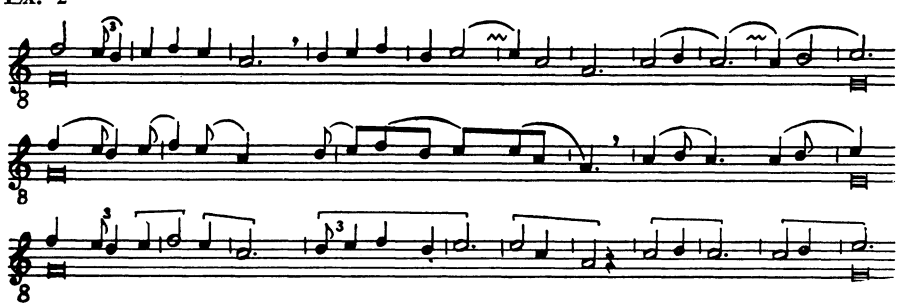
C. Metrical Rhythm. The notes of the upper part have definite time values, short and long, which are arranged in regular measures (triple meter).

D. Modal Rhythm. The upper part is in triple meter, with the notes falling into the regular pattern of one of the rhythmic modes.

Judging from the relatively few transcriptions of organa dupla that have been published,[1] the rhythmic style described under *C* (above) appears to be generally accepted as the basis of transcription for the organal sections of the organa dupla. A detailed discussion of the whole problem is found in H. E. Wooldridge's basic study of early polyphony, in Volume I of *The Oxford History of Music* (*OHM;* first edition of 1901, pp. 176ff). On the basis of an extremely judicious and objective review of the remarks found in the various treatises of the 13th century, Wooldridge, although briefly admitting the possibility that "in the system of *Organum purum* measure, as it was understood in the thirteenth century, finds no place at all" [p. 185], decides in favor of a rendition in triple meter, saying that "it is always perfectly possible to translate the notes of the upper part in measure" and that, on the other hand, his "attempts to construct from the given figures, upon a non-mensural basis, phrases containing any clear musical meaning, have entirely failed" [p. 186]. Accordingly, his transcriptions are in triple meter, with a free change of rhythmic patterns, some measures showing trochaic rhythm (first mode), others iambic (second mode). In more recent transcriptions presented by other scholars this wavering between the two rhythmic patterns is generally avoided, and the upper part appears in what may be considered a free modification of the first mode,

[1] *Judea et Jherusalem: OHM,* I (1st ed.), pp. 188ff (facsimile); Riemann, *Handbuch der Musikgeschichte,* I, 2, p. 156; Handschin, in *ZMW,* X (1927-28), p. 15; Sowa, in *Ein . . . Mensuraltraktat* (1930), p. xxxviii.—*Haec dies:* Adler, *Handbuch,* I, p. 217 (Ludwig); Besseler, *Musik des Mittelalters und der Renaissance* (1937), pp. 99f (facsimile); Davison and Apel, *Historical Anthology of Music,* no. 29.—*Alleluia Pascha nostrum:* Ludwig, in *ZMW,* V (1922-23), p. 448.—*Crucifixus in carne:* Handschin, in *AMW,* VII (1925), p. 161.—*Propter veritatem:* H. Anglès, *El codex musical de las Huelgas* (1931), II, no. 47.—*Tanquam sponsus: OHM,* I (1st ed.), p. 195.—*Virgo Dei genetrix: ibid.,* p. 201.—*Benedicamus Domino:* Davison and Apel, *op. cit.,* no. 28c.

Ex. 2



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involving frequent use of *fractio modi* and *extensio modi*. As an illustration we show three transcriptions of a passage from *Judea et Jherusalem*, that is, the closing *copula*, after the syllable "lem" [Ex. 2].[2] Other transcriptions of a recent date (Ludwig, Anglès) show the same general aspect as those by Sowa and Handschin, but only confirm the impression that, within this general framework of rhythm, all questions and problems of detail are decided on the basis of personal preference and individual "feeling."

The general uncertainty that prevails in this field, and the failure of outstanding scholars to arrive at a uniform solution of the problem on the basis of their general premise, would seem to call for a basic revision and new approach to our question. In the original edition of *The Notation of Polyphonic Music* (1942, pp. 266ff) the present writer tried to formulate a new theory regarding the problematic "Duplum notation," maintaining that its rhythmic style is that of "free rhythm," as previously described under *A* above. A number of remarks found in the writings of the 13th and 14th centuries are quoted in support of this theory. As happens so often in such cases, the language of these quotations is somewhat ambiguous and to a certain extent open to different interpretations.[3] Descriptions such as "infinita multiplicitate ac mira quadam flexibilitate" (Anon. de la Fage), "coherentia vocum immensurabilium" (Walter Odington), or "discurrere per notas sine mensura" (Simon Tunstede) no doubt suggest a "free" rhythmic style, but of course it is difficult for us to determine exactly the degree of freedom indicated by them. Moreover we have no way of knowing whether these descriptions refer to the organa dupla of the Leoninus period or perhaps to others of an earlier period, possibly to those of St. Martial or to similar ones written before Leoninus in Paris, and now lost. In fact, such an assumption would eliminate a difficulty arising from the fact that other theorists explain organum duplum (organum purum, organum speciale, organum per se) in terms suggestive of "free modal rhythm" rather than "free rhythm." Thus Johannes de Garlandia (*CS*, I, p. 114), as well as the Anonymous of 1279 (Sowa, p. 53 and p. 127), draws a distinction between *modus rectus* and *modus non rectus*, ascribing the former to the various types of discantus (organum triplum, clausulae, motets, etc.), the latter to organum per se. We know from the practical sources that organum duplum underwent far-reaching changes of style and rhythm during the course of the 12th century. It is entirely possible that some of the writers describe a type of organum different from the one explained by others. If this possibility is admitted, we can resolve the seeming contradiction between statements about *notae sine mensura* and others about *modus non rectus* by relating the former to organa written in the style of St. Martial and the latter to those of the Leoninus period.

The above-mentioned passage from Garlandia appears in Wooldridge's

[2]The first line of Ex. 2 is from H. E. Wooldridge (*OHM*, I, p. 189, facsimile); the second line is from J. Handschin ("Die mittelalterlichen Aufführungen in Zürich, Bern und Basel," *ZMW*, X, p. 15); the third line is from H. Sowa (*Ein anonymer glossierter Mensuraltraktat 1279* [1930], p. xxxviii.)

[3]The validity of the evidence on which I based my explanations has been questioned by Manfred F. Bukofzer and Oliver Strunk. It was their criticism which induced me to re-examine the entire problem.

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study in a free rendition which is not entirely satisfactory (*OHM*, I, p. 178). Garlandia's term "organum per se" very likely means two-voice organum (organum duplum) as opposed to "organum cum alio," that is, organum duplum with another voice part, hence, organum triplum. We suggest the following translation (and interpretation) of the entire passage (*CS*, I, p. 114: "Organum dicitur multipliciter . . ."):

The term organum is used in various ways: *generaliter* [as a general designation for polyphonic music] and *specialiter* [for organum proper]. *Organum generaliter* has been previously discussed; now we have to speak about *organum in speciali*. There are two types of *organum in speciali*, either *per se* [organum duplum] or *cum alio* [organum triplum, quadruplum]. *Organum per se* is that which is performed either in *modus rectus* [this term refers primarily to the clausula sections of organum duplum] or in *modus non rectus* [this term refers to the organal sections of organum duplum]. By *modus rectus* we mean that type of modus which is used for *discantus*. The [*modus*] *non rectus* is so called in order to distinguish it from a [*modus*] *rectus* in which longae and breves are taken strictly according to the principles of the first mode (*sumuntur debito modo primo, et principaliter*). In *non rectus*, however, the longae and breves are [also] in the first mode, but in a casual manner (*ex contingenti*). Whatever then is sung in an irregular rhythm (*per non rectam mensuram*), as just explained, is called *organum non rectum* [this is identical with "organal sections of organum duplum"]. The *equipollentia* [that is, relationship of the upper to the lower part in this type of music] is limited to a single tone [*unisono:* the sustained note of the tenor], till the end of each *punctus* [section based on one tenor note], where the two parts meet in a consonance. And this is all that needs to be said regarding the *discantus* [same as *equipollentia*] in *organum*.

The longae and breves in such an organum are recognized as follows, that is, through consonance (*per consonantiam*), through the form of the notes (*per figuram*), and through the [rule of the] penultimate (*per penultimam*).

Hence the rule: Everything that occurs anywhere by virtue of consonance, is called long.

Another rule: Whatever has the form of a longa . . .[4] is considered long.

Another rule: Whatever occurs before a long pause, or before a perfect consonance, is considered as long.

The importance of these remarks lies first of all in the clear distinction that is made between two rhythmic styles found in organum duplum, a *modus rectus* for the discantus sections (clausulae), and a *modus non rectus* for the organal sections. Moreover, we learn that there are *longae* and *breves* in this *modus non rectus*, and that they are recognized by certain rules involving a consideration of consonances, of note forms, and of the penultimates. Unfortunately, these rules are so cryptically expressed that it is difficult to draw any definite conclusion from them, except a negative one: the transcriptions discussed and illustrated previously (p. 147) are not in agreement with Garlandia's description of *modus non rectus*. To be sure, this term indicates a free variety of modal rhythm, and could therefore be interpreted as indicating the general style of metrical rhythm (*C* above) which forms the basis of these transcriptions. However, none of the specific rules given by Garlandia are incorporated in these transcriptions.

Somewhat similar are the explanations and rules given by Franco in his *Ars cantus mensurabilis* of *ca.* 1260 (*CS*, I, pp. 134b-135a: "Organum proprie sumptum . . ."):
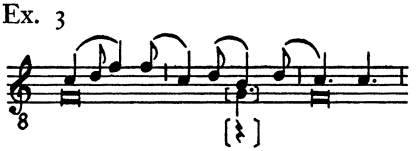
[4]Here follows the somewhat obscure passage: "secundum organa ante pausationem, vel loco consonantie. . ."

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Organum proprie sumptum [probably identical with *organum per se*] is a song which is not everywhere measured [this may refer to the difference between the clausulae and the organal sections, or possibly between the upper part and the tenor]. It should be noticed that *organum purum* exists only above a tenor having a single sustained note (*sola nota in unisono*), and that whenever the tenor has several notes [written closely] together, *discantus* results, as in the following example.[5]

The longae and breves of this organum are recognized by three rules. The first is: whatever is notated as a simple longa is long, and similarly for breves and semibreves. The second rule is: whatever is long, must be in consonance (*indiget concordantia*) with the tenor; if, however, a dissonance appears, the tenor should be silent or should adapt itself into a consonance as is shown here [see Ex. 3. The

Ex. 3



dissonance occurs on the note *b* of the upper part. According to Franco the tenor should either pause at this moment, or move into a consonant note, *g*].

The third rule is: whatever is found immediately before the rest known as *finis punctorum* [that is, the end of a section based on one tenor note] is long, because every penultimate is long. It should also be noticed that whenever in organum purum several notes occur on the same pitch (*similiter in unisono evenerint*), the first only should be clearly sung (*percuti debet*), while the others should be held in *floratura* [this indicates a vocal tremolo; see Garlandia's example of *florificatio vocis* in *CS*, I, p. 116, reproduced in *OHM*, I, p. 187].

The fact that two of the most important theorists of the 13th century give essentially the same set of rules for organum duplum is of no small importance. Unfortunately, Franco's language is perhaps even more cryptical than that of Garlandia, particularly with regard to the "rule of the consonance." There is, however, a third writer who presents the same subject in explanations as clear and detailed as one could wish, namely, the famous Anonymous IV of the British Museum. As is well known, this writer was not a professional theorist like Garlandia or Franco, but, in all probability, a young Englishman who studied at Paris sometime about 1260 or 1270. His manuscript may well represent notes taken during a course given by a professor at the Sorbonne (Joh. de Garlandia?). In fact, the chief value of his "treatise" lies in its much greater spontaneity and diversity of topics as compared with the treatises proper which, although more systematic, frequently limit themselves to the "rules." We are concerned here with the last chapter, Capitulum Septimum, of Anonymous IV, entitled "De modis irregularibus." (*CS*, I, pp. 361-364). This chapter, as well as part of the preceding one, has often been noted for its "mysterious" character and for its "language which is even more disheartening to the student in search of proofs of measurement in the upper part of *organum purum* than that of the author of Ars Cantus Mensurabilis."[6] Actually this characterization is not entirely correct. The second half of the Capitulum Sextum, in which we hear about the "diversitatibus" among the "triplis majoribus," that is, the great organa tripla such as *Alleluia dies sanctificatus*, is rather mystifying, and even more so is the first part of the Capitulum Septimum with its

[5] Here follows a musical example consisting of a short *copula* and a clausula in the style of Leoninus. See the transcription in *OHM*, I, p. 187.

[6] *OHM*, I, p. 184.

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description of the notorious *modi irregulares*. This seventh chapter, however, continues after the "disheartening" description of the irregular modes with an extended explanation of the consonances in organum purum, and how *longae* and *breves* are recognized in organum purum. The language of these explanations is perfectly clear and the principles expounded turn out to be of fundamental importance in our problem. As far as I know, Wooldridge is the only writer to have at least taken passing notice of these explanations (*OHM*, I, p. 184). Here follows a translation of the entire section (*CS*, I, p. 362: "Concordantie organi puri . . ."), with certain passages omitted:

The regular consonances of *organum purum* are unison, octave, fourth, fifth, minor third (*semiditonus*) and major third (*ditonus*). [There follows an enumeration of the *secundariae* and *tertiae* consonances, that is, the regular consonances plus one or two octaves].

In *organum purum* the *longae* and *breves* are recognized in various ways. One of these is: each initial note (*punctus primus*), whether it is consonant according to the above system of consonances, or not, is either[7] a *longa parva*, or a *longa tarda*, or a [*longa*] *media;* and this in whichever ligature it [the initial note] may occur, whether one of two or of three notes, etc.

There is, however, the following difference: if [this note] is consonant [with the tenor], the tenor will sound; if however it is not consonant, the tenor will pause. Similarly each last note [of a section] is long and consonant.

Furthermore each penultimate note before a long rest, as [occurs] at the end of a section [*in fine puncti; punctus* means here a sustained note of the tenor] or of a clausula, is long.

And each penultimate is likewise perceived to be long through the modus, whether it is consonant or not.

Furthermore, in a ligature of two notes (*punctus duorum*) the first note is long if it is in consonance, short if in dissonance. [This applies to the notes considered] as such, not as far as [they are subject to the rule of] the penultimate just mentioned (*in quantum de se et non in quantum penultima predicta*).

Furthermore the last note of two [of a two-note ligature] is long if consonant, short if dissonant, at least as such, etc. [same exception as before].

Furthermore in a ligature of three notes (*punctus trium*) the first note is long if in consonance, otherwise not; the second is long in consonance, otherwise not if considered as such (*in quantum de se*), but is [always] long if it is a penultimate. Each last note of three is long in consonance, short in dissonance, but long in the above-mentioned [case of the] penultimate.

Each note [in a ligature] of four, whether the first, the second, the third, or the fourth, is long if it is in consonance, short if in dissonance.

Furthermore two [successive] notes of the same pitch (*in eodem sono*), whether consonant or not, are performed as a *longa florata.*

Furthermore *currentes* with an antecedent [note], such as those of eleven notes in *Viderunt*, have a certain special manner (*modum extraneum*). [In contrast] to the other [characters] they do not regard whether they are consonant or not;[8] and they descend quickly; if the first note is a *currens* [that is, a note in the diamond shape of the later *semibrevis*], then its antecedent or the second or the third before [is a long].

In the above-mentioned descent [that is, in the example from *Viderunt*] the antecedent is not the note before [the *currentes*] but the second before, and this is long; and the first before, although ascending, is a *currens*, because there are actually twelve *currentes*, not eleven. And the second note before [the *currentes*] is long because it is in the consonance of the fifth. If it were not in consonance, it would yet be long, but the tenor would pause, because always the note before, or

[7] I read here "aut" for Coussemaker's "ante."

[8] ". . . utrum concordant vel non equaliter proposse." The meaning of the last two words is not clear to me.

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the second or the third before [a group of *currentes*] is necessarily long for the convenience of the descent.

And this applies essentially to the human voice, but is not necessary for instruments. Similar rules apply to *currentes* showing ascending and descending motion, or descending and ascending motion, with their antecedent or antecedents, etc.

Furthermore occasionally there are many long notes for the sake of variety (*color*) or beauty of the melody, whether they are consonant or not, as the result of the performance (*quod quidem per se patet in operando*).

Furthermore there is a certain *duplex longa florata*, and this occurs at the beginning [of] *In nomine sanctissimi alpha*, and this is called beginning before the beginning, and is always consonant.

Furthermore there are some who put two or three [notes] in the place of one; and the first of these can be consonant or dissonant, and [in the latter case] always starts shortly before the tenor, and the tenor comes in with the second note if this is consonant, or with the third, and this third note will be prolonged with a florification, as previously explained. And some [composers] put three or four notes in ligature before the beginning of the tenor, and if the last of these is consonant, the tenor will start with this. If it is dissonant, the beginning will be with the first consonant note that follows. . . .[9]

The end of *In nomine sanctissimi* is performed in many ways: some close it with a single note either at the octave or in unison or at the fifth, rarely however at the fourth, except in stringed instruments (*in instrumento cordarum*), and still more rarely at the major or minor third; as men will do according to their pleasure, but the above-described beginning is generally accepted by all.

There are others who place one penultimate before the above-mentioned octave, whether it be in consonance or in dissonance, as long as it is suitable, etc.

There are others who place before this penultimate one, two, three or more others, as may be suitable according to one or several modes (*prout melius competit, vel competunt de uno modo vel pluribus modis*); however, one should not delay too long before coming to the close.

And certain good *organistae* prefer to use dissonances rather than consonances in such penultimates, etc., as appears fully in the books of organa.

Whatever occurs between the above-mentioned beginning and the above-mentioned close is considered as mediation.

In the name and in honor of the Most Holy Mediator of all, who is the true Saviour Jesus Christ, Son of the living God, and who is the Crown and Glory of all the Saints, to which glory may we all arrive with the Most Holy.

These extended explanations can be summed up as follows: (1) The consonances are unison, octave, fourth, fifth, major and minor third. (2) Each first note is long. If the first note is dissonant with the tenor, the tenor pauses (that is, comes in later). (3) Each final note is long and consonant. (4) Each penultimate note before a rest is long, whether consonant or not. (5) In ligatures a note is long if it is consonant, short if it is dissonant (always with the exception of rule 4). (6) Two successive notes of the same pitch, whether consonant or dissonant, form a *longa florata*. (7) *Currentes* descend quickly, but are preceded by a long note. (8) Performers occasionally deviate from the rules, by lengthening dissonant notes, or inserting notes (?).

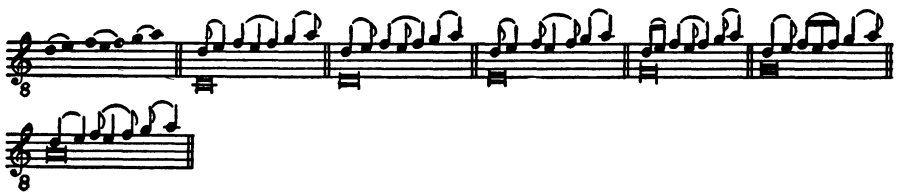
The central rule in this set is rule 5. Since the dupla are always written entirely in ligatures, it means that each note of the upper part is long if it forms a consonance with the sustained note of the tenor, otherwise it is short. This, of course, is exactly what Garlandia and Franco say, although in such a brief manner that one would probably not dare to use their remarks as a foundation for a new approach to the problem of or-

[9] The remaining part of this paragraph is rather obscure.

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ganum duplum. Together with the most detailed explanations and repeated statements of Anonymous IV, however, they form a highly convincing body of evidence, leading to a novel interpretation of the organa dupla, based on the "principle of consonance" rather than on the "principle of ligatures." In fact, one and the same combination of ligatures will have a different rhythmic pattern, depending upon the pitch of the tenor notes. Example 4 illustrates this important point.

Ex. 4



It is interesting to notice that in many cases the principle of consonance automatically leads to rhythmic formations in triple meter. On the other hand, there are probably just as many examples in which longs (*longae*, *L*) and shorts (*breves*, *B*) alternate freely, without leading to formations clearly suggestive of triple meter, to say nothing of regular modal patterns. The question then arises whether in such cases the two basic rhythmic values should be modified and adjusted into the framework of triple meter. Such adjustments are, of course, always possible. In the case of several consonances in succession, *e.g.*, $\frac{e\,f\,e\,g,}{c}$ each note would become a *longa perfecta* (dotted quarter note), while two dissonant notes in succession, *e.g.*, $\frac{g\,a\,b\,c'}{c}$ could be interpreted as *L B/ B L*, etc. The resulting interpretation would be essentially in the same rhythmic style as the transcriptions of Ludwig, Handschin, and others (the metrical rhythm, *C*, of our tabulation), but would, of course, differ from these in many particulars. Example 5 shows a transcription of *Judea et Jherusalem* according to the "rules of consonance" and in triple meter.

The main advantage of this interpretation is that it eliminates most of the arbitrariness that is so disturbing and irritating to the student trying to transcribe an organum duplum along the traditional lines. It completely removes these compositions from the province of "notational problems," and makes them appear as examples of an organic musical practice which involved no hairsplitting calculations and which, with a little training, could easily be recreated by a present-day singer. Nevertheless, the above method of transcription still includes a certain amount of "processing," that is, the adjustment of the groups of longs

Ex. 5



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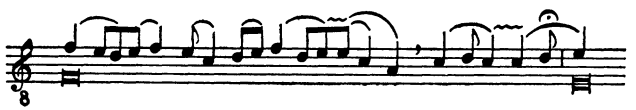
and shorts into triple-meter formations. Although these adjustments are relatively easy to make, they often produce results that are not altogether satisfactory. Among these is the sudden change from trochaic to iambic patterns that results whenever there are two dissonant notes between two consonances; or the frequent occurrence of two, three, or more "consonant" *longae perfectae*, a value that, in all probability, did not appear until a somewhat later period.

Moreover, it should be noticed that the triple-meter adjustment, natural though it appears to the present-day musicologist, is in no way corroborated or required by the explanations of Anonymous IV. In fact, his explanations become much more plausible and convincing if, instead of forcing his longs and shorts into the framework of triple meter, we consider them as the two basic elements of an essentially different rhythmic style, that is, of measured rhythm (*B* of our tabulation). True enough, the explanations of Anonymous IV, although compelling as regards the basic principle of consonance, do not contain definite evidence as to the basic rhythmic style of the organa dupla. Nor can a definite conclusion be drawn from Garlandia's *modus non rectus*. In view of this situation it is all the more important to examine the possibility just outlined. Aside from the fact that it eliminates the last element of arbitrariness, it leads to results that, it seems to me, are most interesting and worthy of serious consideration.

Example 6 is a rendition of *Judea et Jherusalem* in longs and shorts, without metrical adjustments.

For a more extended extended example a *Benedicamus Domino* from W_1, pp. 87′/88 may be considered.[10] The transcription in Example 7 shows the application, not only of the basic rule 5, but also of the other rules of Anonymous IV. Thus the first note is long (rule 1), but since it forms a dissonance with the tenor, this enters with the next note, on *d′*. Likewise the penultimate of each section is long, and two successive notes of the same pitch form a *longa florata*, indicated in the transcription by a wavy line. The *currentes* are reproduced as quick sixteenth notes.

Ex. 6



Each such group is preceded by a long note, which may or may not be in consonance with the tenor. In the latter case the tenor pauses, as is suggested in our transcriptions by the rest. Possibly the tenor also pauses during the *longae floratae* which often fall on dissonant notes. The rhythmic meaning of the *conjunctura ternaria*, consisting of a *longa* and two *currentes*, is ambiguous, depending upon whether this sign is interpreted as the shortest form of the *currentes* or (as regularly in modal notation) as the equivalent of a *ligatura ternaria*. Both meanings are indicated in the example, the latter in small notes.
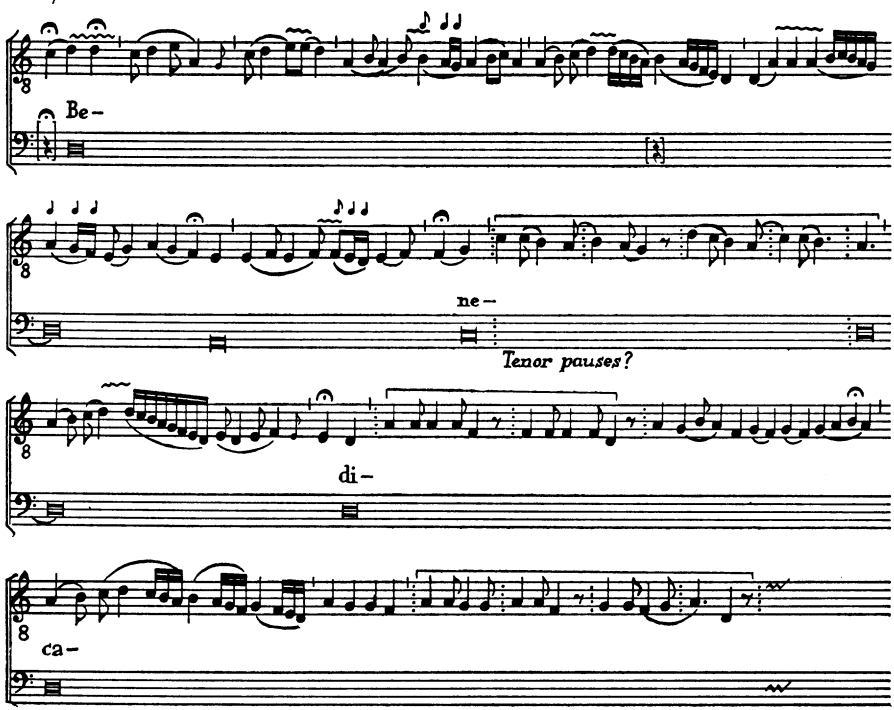
An interesting problem is posed by the fact that the organal sections of the organa dupla, although generally written in highly irregular groups of

[10] See facsimile in *The Notation of Polyphonic Music*, p. 255 (4th ed., p. 247).

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ligatures, usually contain short passages showing the well-known combinations of the first mode, *3 2 2 . . .* or *1 2 2 2 . . . .* An example occurs in the second brace of the *Benedicamus Domino*, immediately after the syllable "ne." Obviously such passages should be read according to the "principle of ligatures," that is, in a strictly modal pattern, not according to the "principle of consonance," which would result here in a distortion of what the writing clearly suggests. Possibly Garlandia was referring to such passages (in addition to the clausulae) when he made the distinction between *modus rectus* and *modus non rectus*. *Modus rectus* is also clearly suggested by various *ordines* on braces 3 and 4 of the *Benedicamus Domino*, in which single notes (necessitated by repeated notes) appear in formations which, from the point of view of rhythm as well as of melody, show the familiar characteristics of the first mode. Naturally, the modal interpretation of these passages often leads to long values for dissonant notes, in violation of the basic principle of consonance. However, a reconciliation of the two principles could be found in the statement made by several theorists that "the tenor pauses, if a dissonance appears." In fact, if organum duplum were to be rendered entirely according to the principle of consonance, these statements would seem to be pointless, except for isolated dissonant notes resulting from the rules 6 and 7 of Anonymous IV. Passages in *modus rectus* such as the above would certainly represent another, and perhaps more

Ex. 7
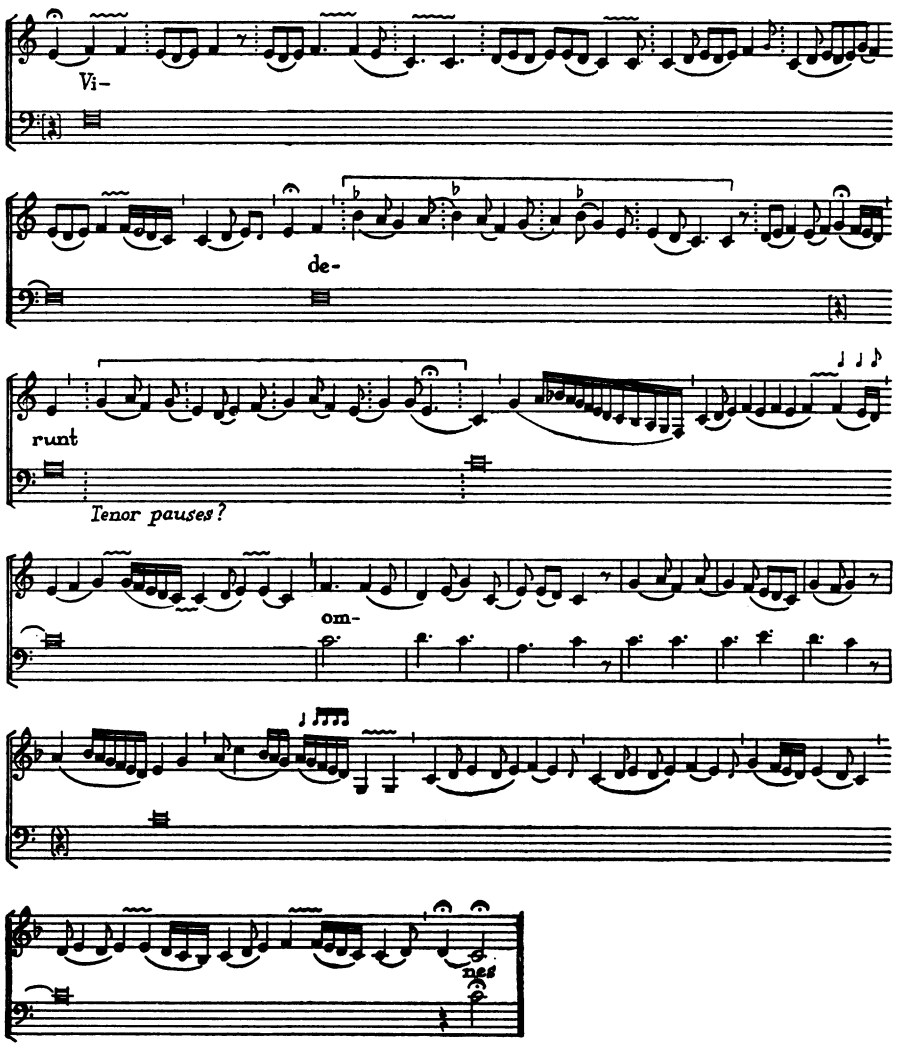


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logical, opportunity for the tenor to pause. In the accompanying transcription these passages are indicated by an extended horizontal line.

While in these *modus rectus* passages modal rhythm appears in opposition to the basic principle of consonances, the organa dupla also often include shorter or longer passages in which triple meter appears as the result of this principle. A particularly extended example is found at the beginning of *Viderunt omnes* (Ex. 8). The initial passage shows several groups of three dissonant notes (*e-d-e*) between two consonant notes (*f*). There can be hardly any doubt that here the consonant *longae* are to be lengthened into *longae perfectae*. Passages like this may well be considered as indicating the transition from measured rhythm (*B*) to metrical rhythm (*C*). A similar problem arises in connection with

Ex. 8



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the passage following the low *g* of the duplum (Ex. 8, middle of brace 5). Here the strict application of the principle of consonance would lead to the version given in our transcription, while modal rhythm would result if the *f'* were treated as a dissonance, and consequently rendered as a short note. No doubt the latter reading would be preferable. That the rules of consonance were occasionally modified is expressly stated by Anonymous IV. Although he mentions only the possibility of treating dissonant notes as longs, it is reasonable to assume that consonant notes could also occasionally be treated as shorts "in operando." Moreover, the passage in question could also be considered as an example of *modus rectus*, since the writing of ligatures, *5 2* (*plic.*) *5 2* (*plic.*), is strongly suggestive of the first mode (*5=3 2*). On the whole it appears that the organum *Viderunt* approximates modal rhythm much more consistently than the *Benedicamus Domino*. Possibly it represents a slightly later stage of development.

Another interesting detail of this organum is the extended *conjunctura* in the middle of the second brace. This is the "currentes cum antecedente, ut in *Viderunt*, undecim punctorum" which Anonymous IV explains in some detail, telling us that actually there are twelve *currentes*, not eleven. The quick notes therefore include the *a'* before the descending notes, and the preceding *g'* is long.

In conclusion we shall try to outline the development of rhythm during the later part of the 12th century, as it appears to us on the basis of the above explanations. As we stated at the beginning of this article, there is every reason to believe that the organa of St. Martial (as well as those of Compostela) are in free rhythm. Of course, it could be argued that we have no definite evidence for this assumption, and that we cannot decide with absolute certainty whether the detailed explanations of Anonymous IV actually refer to the Parisian organa of Leoninus or to the Provençal organa of St. Martial. There are, however, rather compelling reasons for discarding the latter possibility. First it should be noticed that the organa of St. Martial originated in the south of France. It is very doubtful whether, under then prevailing conditions, a Provençal repertory of *ca.* 1150 was still sufficiently known in Paris 130 years later to warrant such detailed explanations as Anonymous IV gives. More decisive, however, is the fact that the organa of St. Martial do not, as a rule, show the extended *puncta* (pedal points) of single sustained notes which form the very foundation of the principle of consonance.[11]

The introduction of this sustained-note style as well as the creation of the contrasting discantus style for the clausulae was, no doubt, the work of the Parisian school, either of Leoninus or of his immediate predecessors. The next step was to find a reconciliation between the sustained-note style which inevitably results in numerous dissonant intervals, and the prevailing theory according to which two-part composition had to proceed in consonant intervals. The solution was the one indicated by Anonymous IV, that is, to make the dissonant notes short and the consonant notes long. Thus it seems that a fundamental concept of meter, that is, a distinction of long and short values, appeared in polyphonic music

[11]An organum duplum of St. Martial is reproduced in *The Notation of Polyphonic Music*, p. 211.

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as the result of an exigency created by a conflict between traditional theory and stylistic progress.

The resulting rhythmic style is one in which longs and shorts alternate freely, as do the consonant and dissonant notes of the melody. Naturally, there often occur passages showing a somewhat regular succession of these values, and these indicate the decisive change from measured rhythm (*B*) to metrical rhythm (*C*). It is not without interest to notice that this change was almost inevitably bound to lead to triple, not to duple meter. While formations in triple meter (*L B/ L*) require only one dissonance, patterns in duple meter (*L BB/ L*) would require two dissonances in succession. Since there are only three dissonances in the scale, and only two of these are contiguous (sixth and seventh), the mere statistical chance for such combinations is relatively small.

The main result of our explanations is a new theory of "the birth of meter" in polyphonic music.[12] It seems to us that for various reasons this theory is preferable to the current thought according to which the organa dupla of Leoninus are in free modal meter. One reason is, of course, that our interpretation is based on evidence found in the theoretical sources of the 13th century, while the customary transcriptions are without such foundation. In addition, our theory leads to a much more organic picture of the evolution of rhythm than results from the traditional method of interpretation. This implies a sort of "evolution in reverse," insofar as the strict modal rhythm of Perotinus would have developed out of a preceding stage characterised by the use of free modal rhythm. Such a development, although not exactly impossible, certainly does not follow the natural lines of evolution. Moreover, no explanation has ever been given for the sudden appearance of "free modal meter" in the Parisian organa, nor would it be easy to find a convincing explanation for the emergence of this entirely novel rhythm. We hope that our explanations of the gradual development of rhythm will be found more satisfactory from the scientific as well as from the morphological point of view.

Boston, Massachusetts

[12] If we accept the theory of the "mensuralists," measured rhythm was used in Gregorian chant, at least during its "golden age," up to the eleventh or twelfth century. See the survey in Reese, *Music in the Middle Ages* (1940), pp. 143ff. An important recent contribution is W. Lipphardt, "Neue Wege zur Erforschung der linienlosen Neumen," *Die Musikforschung,* I (1948), p. 121. Eventually the problem of the troubadour and trouvère melodies will also have to be included in the study of the evolution of rhythm. Recent scholars are inclined to take a much more cautious view regarding the "modal interpretation" of these melodies than was customary ten or twenty years ago. See, *e.g.,* J. Handschin's review of U. Sesini, *Le melodie trobadoriche. . .* (1942) in *Acta Musicologica,* XX (1948), p. 62, and the present writer's review of H. Anglès, *La musica de las Cantigas . . .* (1943) in *Speculum,* XXII (1947), p. 458.

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