

# SYLLABLE QUANTITY IN LATE LATIN CLAUSULAE

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IN 1960 SILVIA JANNACCONE WARNED that "le clausole di Ammiano . . . da sole non permettono deduzioni di ordine fonetico e morfologico scientificamente soddisfacenti."<sup>1</sup> In 1977 Devine and Stephens concurred for late Latin clausulae in general as regards the hypotheses of Harmon and Hagendahl concerning *qu*.<sup>2</sup> The statistically controlled demonstration by Hall and Oberhelman of the linguistic reality and prevalence of the *cursus mixtus* from Arnobius to Ennodius,<sup>3</sup> however, suggests a new research design which, I believe, not only rehabilitates late Latin clausulae as an important source of phonological evidence, but, at the very least, establishes a number of striking regularities that must be considered by any student of Latin prose rhythm.

In the *cursus mixtus* system of prose rhythm clausulae conform to both one of the accentual *cursus* (*planus*, *tardus*, or *velox*; see below) and one of the quantitative types (cretic-spondee, dicretic, cretic-tribrach, or ditrochee). In this paper S indicates a linguistic syllable, Š a stressed syllable, Š a heavy syllable, Š a light syllable, Š a syllable that occurs in *anceps* position, # a word boundary, and (#) an optional word boundary. Accordingly the (accentually defined) *planus* may be represented as (#)ŠŠŠŠŠ#, e.g., *mente victurus* (*Pan. Lat.* 3.24.3), the *tardus* as (#)ŠŠŠŠŠŠ#, e.g., *infida mobilitas* (*Pan. Lat.* 4.11.4), and the *velox* as (#)ŠŠŠŠŠŠŠ#, e.g., *similitudinem requirebat* (*Pan. Lat.* 8.4.1). The regular quantitative forms and the main caesural divisions that clausulae take in the *cursus mixtus* system are:

## 1.a *planus* and cretic-spondee

- |                               |                         |
|-------------------------------|-------------------------|
| 1.a.1 <i>censura divina</i>   | (#)ŠŠŠ#ŠŠŠ <sup>x</sup> |
| 1.a.2 <i>perspici possint</i> | (#)ŠŠŠ#ŠŠ#              |

<sup>1</sup>S. Jannaccone, *Ammiano Marcellino* (Naples 1960) 103.

<sup>2</sup>A. M. Devine and L. D. Stephens, *Two Studies in Latin Phonology* (Saratoga, Cal. 1977) 52; A. M. Harmon, "The Clausulae in Ammianus Marcellinus," *Connecticut Academy of Arts and Sciences* 16 (1910-1911) 226-228; H. Hagendahl, "La prose métrique d'Arnobé," *Göteborgs Högskolas Årsskrift* 42 (1937) 96.

<sup>3</sup>S. Oberhelman and R. Hall, "Meter in Accentual Clausulae of Late Imperial Latin Prose," *CP* 80 (1985) 214-227. I am grateful to Ralph Hall and Steven Oberhelman for generously making available to me their unpublished data. The tests reported in the text of the current paper rest on my analyses of this material.

On the *cursus mixtus* see, inter alios, W. Meyer "Die rythmische lateinsiche Prosa," in *Gesammelte Abhandlungen zur mittellateinischen Rhythmik* 2 (Berlin 1902); M. G. Nicolau, *L'origine du "cursus" rythmique et les débuts de l'accent d'intensité en latin* (Paris 1930).

- 1.b *planus* and ditrochee  
 1.b.1 *negaturus remansit* (#)ṡṡ#ṡṡṡṡ<sup>x</sup>#
- 2.a *tardus* and dicretic  
 2.a.1 *missa pervenerit* (#)ṡṡ#ṡṡṡṡ<sup>x</sup>#  
 2.a.2 *fallentibus venditant* (#)ṡṡṡṡ#ṡṡṡṡ<sup>x</sup>#
- 2.b *tardus* and cretic-tribrach  
 2.b.1 *videbantur accipere,*  
*blanda perniciēs* (#)ṡṡ#ṡṡṡṡ<sup>x</sup>#  
 2.b.2 *miraculo faceret* (#)ṡṡṡṡ#ṡṡṡṡ<sup>x</sup>#
- 3.a *velox* and ditrochee  
 3.a.1 *vulnere vulneretur* (#)ṡṡṡṡ#ṡṡṡṡ<sup>x</sup>#
- 3.b *velox* and cretic-spondee  
 3.b.1 *mendacio colorati* (#)ṡṡṡṡ#ṡṡṡṡ<sup>x</sup>#

The *cursus mixtus* system is, of course, statistically defined. Not every clausula in a work employing the *cursus mixtus* is always one of the six quantitative forms listed above. Some may be neither accentual nor quantitative, some only accentual, others (perhaps fortuitously) only quantitative. Nevertheless, *cursus mixtus* forms that have the linguistic stress on the first syllable of the quantitative unit (in traditional terms coincidence of “ictus and accent”), namely 1.a, 2.a, 2.b, and 3.a (to the extent that a secondary stress is posited and assumed rhythmically equivalent in the system: (#)ṡṡṡṡṡṡṡ<sup>x</sup>#<sup>4</sup>) are in the overwhelming majority, ranging from a minimum of 65.4% of all *cursus* forms in Ambrose’s *De obitu Theodosii* to a maximum of 94.9% in Symmachus’ *Orationes*, according to Hall and Oberhelman.<sup>5</sup>

#### I. QUANTITATIVE DEVIATIONS

Deviations from the patterns of syllable quantity prescribed for the regular forms of the *cursus mixtus* system have not received much systematic study but are an extremely valuable source of data for a more refined understanding of the system itself, the individual practices of the authors who employ it, and, I will argue, some of the ways in which syllable quantity was eroded in late Latin.

<sup>4</sup>Philological support for such an assumed secondary stress might be seen in the rarity of *velox* types of the *cursus mixtus* in which lexical polysyllabic words precede a final word of the shape #ṡṡṡṡ#.

<sup>5</sup>Oberhelman and Hall (above, n. 3).

### *Description of samples*

In this section I provide a thorough statistical description of the samples on which this study is based. Quantity deviations in the accentually defined *planus*, *tardus*, and *velox* clausulae occurring in samples from the following works have been studied: Ambrose *De excessu fratris*, *De obitu Theodosii*; Ammianus; Arnobius; Augustine *Epistulae* (A.D. 396 and later); Ausonius *Gratiarum actio* (and prose portions of the *Epistulae*); Cyprian *De lapsis*, *De mortalitate*, *De habitu virginum*; Ennodius *Panegyricus*; Lactantius *Institutiones divinae*, *Epitome inst. div.*, *De ira*, *De opificio*, *De mortalitate persecutorum*; Minucius Felix; *Panegyrici Latini* 3, 5, 6, 7, 8, 10, 11; Symmachus *Orationes*, *Relationes*, *Epistulae*; the (pseudo-) Apuleian *De Platone*, *De mundo*, *Peri ermeneias*, and *Asclepius*. Hall and Oberhelman classify all of the above works except Ammianus, the (pseudo-) Apuleian *Peri ermeneias* and *Asclepius*, and Lactantius *Inst. div.*, *Epitome inst. div.*, and *De ira* as *cursus mixtus*. *Inst. div.* is classified as metrical prose, *Epitome inst. div.* and *De ira* as indeterminate; the remaining three are classified as (accentual) *cursus* but not *cursus mixtus*. My analysis of the samples which Hall and Oberhelman kindly provided does not reveal any significant differences between the *De Platone* and *De mundo* on the one hand and the *Asclepius* and *Peri ermeneias* on the other in regard to the quantitative forms that fall under the accentually defined *planus*, *tardus*, and *velox* clausulae; the (pseudo-) Apuleian works are, accordingly, reported together to maximize sample size. The two unclassified works of Lactantius are also treated together, but kept distinct from his *cursus mixtus* works. The metrical *Inst. div.* is included here for the sake of contrast, and, in particular, because it contains the only cases of the deviant *planus* of the form *privatione doloris*, yet does not provide any instance of the deviant *tardus* types *munus oboediat* or *ignota remedia*.

To avoid raising needless problems concerning Latin sentence accentuation and sandhi, *cursus* forms involving monosyllables and non-lexical disyllables have been excluded. The following is a list of the linguistic forms of *cursus* clausulae for which quantity deviations are reported in the following tables:

1.a.1/b.1	(#)SS#SSS#
1.a.2	(#)SSS#SS#
2.a.1/b.1	(#)SS#SSSS#
2.a.2/b.2	(#)SSS#SSS#
3.a.1/b.1	(#)SSS#SSSS#

(The 3.a.1 and 3.b.1 types of the *velox* constitute the only caesural variety not involving monosyllables or non-lexical dissyllables which are frequent enough to be fruitfully examined here.)

In 1.a.1 and 1.b the phonological rules of Latin word stress fix the quantity

of the penultimate syllable of the final word and of the preceding word if it is three or more syllables long. Since the final syllable in all *cursus mixtus* clausulae is *anceps*, eight distinct quantity patterns could be listed. However, two, (#)SS̄#SS̄SS̄# and #SS̄#SS̄SS̄#, constitute 1.b, ditrochee, and two, (#)SS̄#SS̄SS̄# and #SS̄#SS̄SS̄#, constitute the dispondee, which is an acceptable by-form of the *planus* in certain authors. Accordingly Table 1 is a full presentation of quantity patterns observed in the *planus* type 1.a.1/b.1 in the present samples.

Table 2 presents the one regular pattern and seven distinct quantity deviations of the *planus* type 1.a.2 (of course a clausula ending in a dissyllable can only have word stress on the fifth syllable from the end if the fourth is short).

Since the *tardus* types 2.a and 2.b are equally acceptable, the quantity under the second stress is *anceps* from the point of view of the *cursus mixtus* system, and the penultimate syllable must be short. Thus there are one regular and seven deviant quantitative patterns observable in 2.a.1/b.1. (For data on the rates of heavy and light syllables in the *anceps* position see below, 91. There appears to be no correlation between the type of quantity deviation and the quantity of the *anceps*; see 82–83.) Table 3 presents the distinct quantity forms observed in 2.a.1/b.1 in the present samples.

In the *tardus* type 2.a.2/b.2 the second and fifth syllable from the end must be short, so there are four quantitatively distinct patterns; they are presented in Table 4.

In the *velox* types 3.a.1 and 3.b.1 the penultimate must be long and the sixth from the end short, and the forms (#)SS̄SS̄#SS̄SS̄# and (#)SS̄SS̄#SS̄SS̄# fall under the ditrochee and (#)SS̄SS̄#SS̄SS̄# and (#)SS̄SS̄#SS̄SS̄# under the dispondee. Thus six distinct forms are listed in Table 5.

#### *The linguistic type and environment of quantity deviations:*

Since the *cursus mixtus* is statistically defined, and does permit deviations, it might be thought that, even in a work shown to have a statistically significant preference for coincidence of stress and regular quantity forms, clausulae such as *privazione doloris*, *animalia constant*, *invisibilis semper*, and *effici potest* were simply accentual *planus* clausulae wholly unrelated to the quantitatively regular forms of the *cursus mixtus planus*. Such a view, however, is, purely in empirical terms, inadequate. As Tables 1 and 2 show, from the (pseudo-) Apuleian *De Platone* and Minucius Felix to Augustine there obtains a remarkable and never previously demonstrated relationship between these forms. The type *privazione doloris* does not occur in the samples of texts classified as *cursus mixtus* (or *cursus*); furthermore the type *animalia constant*, while permitted in texts which exclude the type *privazione doloris*, occurs only if both of the types *invisibilis semper* and *effici potest* also occur; the type *invisibilis semper* is permitted in texts which

TABLE 1

*Planus* 1.a.1/b.1 and quantity deviations

	cretic- spondee	ditrochee	#ŠŠ#ŠŠŠ#	(#)ŠŠ#ŠŠŠ#	#ŠŠ#ŠŠŠ#	dispondee	no. of clausulae
Ps.-Apuleius	69.46%	20.20%	0.49%	0	0	9.85%	203
Minucius Felix	85.71%	12.99%	0	0	0	1.38%	77
Cyprian	90.91%	7.39%	0	0	0	1.70%	176
Arnobius	92.59%	6.67%	0.74%	0	0	0	135
Lactantius							
<i>cursus mixtus</i>	79.43%	16.31%	0	0	0	4.26%	141
indeterminate	81.16%	15.94%	0.72%	0	0	2.17%	138
metrical	76.15%	22.02%	0	1.83%	0	0	109
<i>Pan. Lat.</i>	89.47%	9.36%	0	0	0	0.88%	342
Ammianus	44.90%	3.06%	0.51%	0	0	30.10%	196
Ausonius	81.54%	3.08%	0	0	0	15.38%	65
Symmachus	92.75%	6.83%	0	0	0	0.41%	483
Jerome	76.54%	22.22%	0	0	0	1.23%	81
Ambrose	65.81%	25.64%	0	0	0	8.55%	117
Augustine	86.67%	6.15%	0.51%	0	0.51%	6.15%	195
Ennodius	96.15%	3.85%	0	0	0	0	52

TABLE 3  
*Tardus* 2.a.1/b.1 and quantity deviations

	dicretic or cretic- tribrach	#SS#SSSS# (#)SS#SSSS#	#SS#SSSS# (#)SS#SSSS#	#SS#SSSS# (#)SS#SSSS#	#SS#SSSS# (#)SS#SSSS#	#SS#SSSS# (#)SS#SSSS#	#SS#SSSS# (#)SS#SSSS#	#SS#SSSS# (#)SS#SSSS#	no. of clausulae
Ps.-Apuleius	72.81%	1.75%	16.67%	2.63%	3.51%	0	2.63%	0	114
Minucius Felix	100.00%	0	0	0	0	0	0	0	65
Cyprian	100.00%	0	0	0	0	0	0	0	78
Arnobius	96.30%	0	3.70%	0	0	0	0	0	54
Lactantius:									
<i>curtus mixtus</i>	90.48%	0	4.76%	0	0	0	3.17	1.59	63
indeterminate	76.92%	0	6.15%	4.62%	3.08%	0	6.15%	3.08%	65
metrical	96.88%	0	3.13%	0	0	0	0	0	32
<i>Pan. Lat.</i>	96.64%	0	1.68%	0	0	0	1.68%	0	238
Ammianus	61.76%	2.94%	35.29%	0	0	0	0	0	34
Ausonius	100.00%	0	0	0	0	0	0	0	54
Symmachus	100.00%	0	0	0	0	0	0	0	340
Jerome	93.94%	0	3.03%	1.52%	1.52%	0	0	0	66
Ambrose	77.11%	2.41%	10.84%	0	1.20%	0	6.02%	2.41%	83
Augustine	77.68%	0.89%	8.93%	0	1.79%	0	6.25%	4.46%	112
Ennodius	98.55%	0	0	0	0	0	1.45%	0	69

TABLE 2  
*Planus* 1.a.2 and quantity deviations

cretic- spondee	(#)SS̄SS̄SS̄#	(#)SS̄SS̄SS̄#	(#)SS̄SS̄SS̄#	(#)SS̄SS̄SS̄#	(#)SS̄SS̄SS̄#	(#)SS̄SS̄SS̄#	(#)SS̄SS̄SS̄#	(#)SS̄SS̄SS̄#	no. of clausulae
Ps.-Apuleius	62.69%	11.94%	2.99%	8.96%	8.96%	1.49%	1.49%	1.49%	67
Minucius Felix	92.86%	0	0	0	7.14%	0	0	0	14
Cyprian	79.09%	9.30%	0	9.30%	2.33%	0	0	0	43
Arnobius	66.66%	7.41%	0	25.93%	0	0	0	0	27
Lactantius:									
<i>cursus mixtus</i>	51.16%	18.60%	2.33%	9.30%	13.95%	4.65%	0	0	43
indeterminate	52.00%	28.00%	0	10.00%	8.00%	2.00%	0	0	50
metrical	61.29%	22.58%	0	0	3.32%	12.90%	0	0	31
<i>Pan. Lat.</i>	46.94%	44.90%	0	0	4.08%	4.08%	0	0	49
Ammianus	54.55%	18.18%	1.52%	19.70%	4.55%	0	1.52%	0	66
Ausonius	0	100.00%	0	0	0	0	0	0	6
Symmachus	37.93%	62.07%	0	0	2.33%	0	0	0	29
Jerome	40.91%	36.36%	0	18.18%	18.18%	0	0	0	22
Ambrose	39.13%	30.40%	0	4.35%	26.09%	0	0	0	23
Augustine	49.21%	33.33%	0	11.11%	1.59%	1.59%	3.17%	0	63
Ennodius	50.00%	50.00%	0	0	0	0	0	0	2

TABLE 4  
*Tardus* 2.a.2/b.2 and quantity deviations

	dicretic or cretic- tribrach	(#)ŠŠŠ#ŠŠŠ#	(#)ŠŠŠ#ŠŠŠ#	(#)ŠŠŠ#ŠŠŠ#	no. of clausulae
Ps.-Apuleius	86.00%	8.00%	4.00%	2.00%	50
Minucius Felix	96.55%	0	3.45%	0	29
Cyprian	100.00%	0	0	0	26
Arnobius	74.19%	25.81%	0	0	31
Lactantius:					
<i>cursus mixtus</i>	66.67%	23.08%	5.13%	5.13%	39
indeterminate	85.71%	7.14%	0	7.14%	28
metrical	78.57%	14.29%	0	7.14%	14
<i>Pan. Lat.</i>	94.44%	2.78%	2.78%	0	36
Ammianus	81.82%	0	9.09%	9.09%	11
Ausonius	100.00%	0	0	0	3
Symmachus	90.01%	9.09%	0	0	11
Jerome	75.00%	6.25%	12.50%	6.25%	16
Ambrose	80.00%	0	0	20.00%	10
Augustine	72.22%	19.44%	5.56%	2.78%	36
Ennodius	100.00%	0	0	0	1

exclude the type *animalia constant*, but only if they also admit the type *effici potest*; finally the type *effici potest* is admitted in texts which exclude all of the foregoing. Obviously such a strictly ordered, hierarchical scale of admissibility could not exist if all quantity deviations from regular *cursus mixtus* forms were equivalent (as merely accentual clausulae). Since this hierarchy involves both the type of quantity deviation (Š for Š or Š for Š) and the environment in which it occurs, no approach that ignores these factors can attain even descriptive adequacy.

It might also be thought that some authors may have been content to combine any recognizable, albeit non-standard, metrical form with accentual *cursus* types.<sup>6</sup> Such an approach could, at least in theory, attempt to explain the hierarchy of admissibility of deviations in terms of a scale of preferences for non-standard metrical forms (though at the obvious risk of circularity). The examples just cited, however, are sufficient to demonstrate that such an

<sup>6</sup>I am indebted to Ralph Hall for this felicitous formulation.



TABLE 5  
*Velox* 3.a.1/b.1 and quantity deviations

	cretic- spondee	ditrochee	(#)ŠŠŠ#ŠŠŠ#	dispondee	(#)ŠŠŠ#ŠŠŠ#	(#)ŠŠŠ#ŠŠŠ#	no. of clausulae
Ps.-Apuleius	11.19%	79.10%	3.73%	3.73%	0	2.24%	134
Minucius Felix	28.75%	56.25%	3.75%	1.25%	12.25%	0	80
Cyprian	24.43%	68.70%	6.11%	0.76%	0	0	131
Arnobius	5.26%	86.32%	1.05%	2.11%	1.05%	1.05%	92
Lactantius:							
<i>cursus mixtus</i>	16.56%	64.90%	3.31%	6.62%	2.65%	5.96%	151
indeterminate	22.32%	60.71%	2.68%	5.36%	5.36%	3.75%	112
metrical	20.00%	67.68%	3.08%	3.08%	3.08%	3.08%	65
<i>Pan. Lat.</i>	25.00%	67.90%	3.09%	2.78%	1.23%	0	324
Ammianus	17.42%	35.48%	5.16%	37.42%	1.94%	2.58%	155
Ausonius	19.30%	73.68%	7.02%	0	0	0	57
Symmachus	11.33%	88.43%	0.24%	0	0	0	415
Jerome	13.89%	75.00%	0	9.72%	0	1.39%	72
Ambrose	23.30%	64.08%	2.91%	8.74%	0.79%	0	103
Augustine	7.87%	56.74%	1.12%	19.66%	6.74%	7.87%	178
Ennodius	8.70%	76.09%	0	15.22%	0	0	46

approach is in general inadequate. The fact that quantity deviations from regular *cursus mixtus* forms can sometimes be given metrical labels which correspond to metrical clausulae employed by quantitative, non-accentual authors, such as Cicero, not only does not lead to principled explanations, but also, in some cases, is misleading in its implications. For example, both the type *privazione doloris* and the type *animalia constant* could be labelled *planus* and dactyl-spondee, but since they have the identical metrical form, that metrical form cannot account for the difference between them in admissibility. The difference in the location of the caesura is quite irrelevant, but if it were invoked, it could only suggest that the type *privazione doloris* would stand in just the opposite relations to *animalia constant* from that which is observed, since the former caesural location is everywhere preferred in the *planus*.

Consider now a form which deviates from the *tardus* 2.a.2 pattern, (̄#)̄SS̄#̄SS̄#, *est spatium temporis, ambiguo conloco*, which has a heavy syllable preceding the first stress, and the form (̄#)̄SS̄#̄SS̄#, (*nomine*) *domini martyrū, miserias venerit*, which has a light syllable preceding the first stress. The latter type, (̄#)̄SS̄#̄SS̄#, could be labelled a fourth paeon-cretic, as found in Cicero, the former could not. Without further qualification, such an approach would suggest that the fourth paeon-cretic would be preferred. Yet no such preference can be demonstrated, not even in Arnobius, an author who is quite scrupulous about achieving a high rate of metrical forms. Exactly parallel considerations apply for the forms deviating from the *tardus* 2.b.2 patterns *praestigiis referam* and (*ut*) *eadem faceret*. Nevertheless, the metrical form that results from a quantity deviation may not always be completely irrelevant. The fact that the type *effici potest* can be analyzed as trochee-cretic, as found in Cicero, may not be unrelated to the fact that, in some authors (see below on Ausonius), it appears to be an acceptable, or even regular, by-form. Yet even in this case the labelling of the metrical form is of only partial relevance. The assumption that the trochee-cretic is, qua metrical form, acceptable in the *cursus mixtus* is not true. For not only the *planus* type *effici potest* but also the *tardus* type *rursus coarguam* (which contains two deviations from 2.a.1/b.1) can be labelled trochee-cretic. Nevertheless the type *rursus coarguam* is excluded from many of the works which admit the type *effici potest*, but not vice versa. If analysis stops at giving each of these clausulae the same metrical label, nothing remains by which to account for the difference in permissibility, so that it would follow, quite wrongly, that they should be equally acceptable (at least relative to their respective regular forms). It would be quite *ad hoc* to claim that the trochee-cretic “fits” better with the *planus* than with the *tardus*, especially as both, on this analysis, lack coincidence of “ictus” and accent. Once again it is clear that, above and beyond the metrical labels that may be assignable to deviant *cursus* forms, the type of deviation (̄ for ̄ or ̄

for Š) and the linguistic environment in which it occurs must be taken into consideration.

### *Classification of deviations*

Quantity deviations can, of course, be of two types: a light syllable may occur where the regular *cursus mixtus* clausula requires a heavy syllable, or a heavy syllable may occur where the regular *cursus mixtus* clausula requires a light syllable. The former type of deviation, substitution of Š for S̄, will be denoted by the symbol Ṧ, the latter type, the substitution of S̄ for Š, by the symbol S̄̇. A deviation may occur in any syllable of a word, whether stressed or unstressed. The following word shapes provide the most frequent, most controllable, and most fruitfully studied sources of deviation.

1. #ŠŠ#: substitution of Š for S̄ under stress. This deviation will be studied in the following types of clausulae: 1.a.1 *effici potest*. The resulting metrical form can, as noted above, be labelled trochee-cretic, but, as discussed below, such a labelling may not be wholly appropriate. 2.a.1 *malus occiderit*. It is irrelevant whether the resulting clausula can be analyzed as a fourth paeon-cretic or not. 2.b.2 *habet eximias*. Again it is irrelevant whether the resulting clausula occurs in a context that could be analyzed as yielding a fourth paeon or not. In 1.a.1 *genus humanum*, the word shape #ŠŠ# is ambiguous as to the type of deviation, since it could also be analyzed as 1.b. with two deviations. This type will not be considered.

2.(#)ŠŠŠ#: substitution of Š for S̄ under stress in the antepenultimate syllable of trisyllables and longer words. This deviation will be studied in the following clausulae: 1.a.2 *invisibilis semper*, 2.a.2 *spatium temporis*, and 2.b.2 *praestigiis referam*. Again there is no tendency for these deviations to occur preferentially in contexts yielding a fourth paeon.

3.(#)ŠŠŠ#: substitution of Š for S̄ in the final syllable of words with stress on the antepenult. This deviation will be studied in the following clausulae: 1.a.2 *animalia constant*, 2.a.2 *reddere possumus*, 2.b.2 *profuderit animam*. The resulting deviations in 1.a.2 and 2.a.2 can, of course, be labelled dactyl-spondee and dactyl-cretic respectively, if it is so desired, but no interesting implications concordant with the data appear to follow from so doing.

4. #ŠŠŠŠ#: substitution of Š for S̄ in the pro-antepenultimate syllable of words with antepenultimate stress. This deviation is studied in the following clausulae: 2.a.1 *munus oboediat* and 2.b.1 *ignota remedia, sancta religio*. These two deviations have the same metrical form as those in 3 above, although it will emerge that they behave quite differently.

5. #ŠŠŠ#: possible substitution of Š for S̄ in the antepenultimate syllable of trisyllables with penultimate stress. This deviation is considered only in 1.a.1/b.1 type *privazione doloris*. This deviation could, of course, be labelled dactyl-spondee. More importantly, however, the type *privazione doloris* is strictly ambiguous, for it could arise via the substitution of Š for S̄ in

the final syllable of words with penultimate stress in the first part of the *planus* ditrochee 1.b. However this deviant clausula be analyzed, it is instructive to see how it relates to the others. # $\check{S}\check{S}\check{S}\#$  in the type *quia dederunt* is not considered on account of its ambiguity.

6. (#) $\check{S}\check{S}\#$ : substitution of  $\check{S}$  for  $\check{S}$  in the final syllable of words with penultimate stress. This type of deviation is studied in the following clausulae: 2.a.2 *conditionis discrimine, portis emittitur*, and 2.b.2 *condicioni conciliat, sensu concipitur*. These forms could be labelled spondee-cretic. In 1.a.1/b.1. the deviant (#) $\check{S}\check{S}\#$  $\check{S}\check{S}\#$ , *mentem reflexit*, is strictly ambiguous, since it could be analyzed as arising by substitution of  $\check{S}$  for  $\check{S}$  in the antepenultimate syllable of trisyllabic words with penultimate stress, rather than from (#) $\check{S}\check{S}\#$ . The status of (#) $\check{S}\check{S}\#$  $\check{S}\check{S}\#$  is further complicated by evidence that the dispondee may be an acceptable by-form in some authors. It will not be considered here.

The *velox*, unfortunately, provides no regular form open to completely unambiguous analysis. In one case, however, the ambiguity is only partial, concerning, not the type of deviation, but only its location. A final segment of the *velox* of the shape # $\check{S}\check{S}\check{S}\check{S}\#$  must arise by some form of substitution of  $\check{S}$  for  $\check{S}$ , but it could be either in the antepenultimate (pretonic) syllable of the cretic-spondee or the pro-antepenultimate (ante-pretonic) syllable of the ditrochee type of *velox*. The segment # $\check{S}\check{S}\check{S}\check{S}\#$  will be studied below. The segment # $\check{S}\check{S}\check{S}\check{S}\#$ , however, will not, since it is not only similarly ambiguous, but also subject to the same complications arising from the status of the dispondee as those noted for the *planus*.

## II. THE IMPLICATIONAL HIERARCHY OF TYPES AND ENVIRONMENTS

Let us begin with the four environments for the substitution of  $\check{S}$  for  $\check{S}$  just enumerated and the deviation presented by # $\check{S}\check{S}\check{S}\#$  in the *planus* 1.a.1/b.1. Ennodius has not been included in the following table because his virtual exclusion of the clausular types with displaced caesura, 1.a.2, 2.a.2, and 2.b.2, makes it impossible to compare him to the other authors. The sign + in Table 6 means "occurs" and - means "does not occur."

We see that not only are the word shapes in which the deviations occur not randomly scattered over the works studied, they are not random in relation to each other. Before examining the highly structured pattern of deviations, however, the position of two works needs to be discussed. It is probably not coincidental that the one exception to the exclusion of # $\check{S}\check{S}\check{S}\#$  from works also excluding # $\check{S}\check{S}\check{S}\check{S}\#$  occurs in the only metrical, non-accentual text examined, Lactantius's *Institutiones divinae*. The horizontal line in Table 6 above the entry for Lactantius metrical emphasizes this special status. In fact the exceptional position of this work in the scaling revealed by Table 6 serves to confirm Hall and Oberhelman's classification.

TABLE 6  
Implicational scaling of substitution of Š for Š̄

	#ŠŠŠ#	#ŠŠŠŠ#	(#)ŠŠŠ#	(#)ŠŠŠ#	#ŠŠ#
Ausonius	—	—	—	—	+
Cyprian	—	—	—	+	+
Symmachus	—	—	—	+	+
Arnobius	—	—	+	+	+
Minucius Felix	—	—	+	+	+
Ammianus	—	—	+	+	+
Ps.-Apuleius	—	+	+	+	+
<i>Pan. Lat.</i>	—	+	+	+	+
Lactantius:					
<i>cursus mixtus</i>	—	+	+	+	+
indeterminate	—	+	+	+	+
Jerome	—	+	+	+	+
Ambrose	—	+	+	+	+
Augustine	—	+	+	+	+
Lactantius:					
metrical	+	—	+	+	+

It is not unreasonable to suppose that a metrical work of this period and provenience (see section 4 below) would have been composed with reference to a different (more conservative) phonological register of Latin than *cursus mixtus* texts, so that the pattern of relationships between the various types of quantity deviation discussed below would not obtain. Furthermore, in a metrical text the accentual status of the type *privatione doloris* as a *planus* would be fortuitous, and it would be admitted or resisted purely as a dactyl-spondee.

The position of Ausonius also requires some comment. Like Ennodius, Ausonius avoids the clausal types with displaced caesura, but he has been included in the table because statistical evaluation is possible in the case of #ŠŠ#. All six of the 1.a.2 clausulae that occur in Ausonius show the substitution of Š for Š̄. Despite the small number of cases, this cannot be the result of mere chance. If we compare Ausonius with the otherwise very similar Cyprian we obtain the results reported in Table 7.

TABLE 7  
Comparison of # $\acute{S}\acute{S}\#$  and # $\acute{S}\acute{S}\#$  in the *planus* in Ausonius and Cyprian

	# $\acute{S}\acute{S}\#$	# $\acute{S}\acute{S}\#$
Ausonius	0	6
Cyprian	38	5
p = .000033 (by the hypergeometric distribution)		

We see that the difference is highly significant: there is less than less than one chance in 30,268 ( $p = .000033$ ) that no instances of # $\acute{S}\acute{S}\#$  would turn up in Ausonius purely as the result of random effects. A similarly significant value is obtained if one prefers a test against the chronologically closer Symmachus or even Jerome. The exclusion of the metrical form (#) $\acute{S}\acute{S}\acute{S}\#$  of 1.a.2 in Ausonius raises an interesting question as to how the permitted (#) $\acute{S}\acute{S}\#$  should be analyzed. While it may be influenced by the Ciceronian trochee-cretic, should it be given a label that implies lack of coincidence of "ictus" and accent, particularly in view of the high level of such coincidence in other clausulae of Ausonius? The significance of the exclusion of # $\acute{S}\acute{S}\#$  in Ausonius cannot be demonstrated at the  $p = .05$  level, since it is nowhere a high frequency deviation and there are only nine instances of the clausular types 1.a.2 and 2.a.2/b.2. Moreover, there is among the clausulae potentially involving sandhi *actu habitu et tempore*, where *habitu et* might appear to have the form (#) $\acute{S}\acute{S}\#$ . However, if we postulate sandhi between *actu* and *habitu*, verse practice would suggest that this would produce a heavy initial syllable for *habitu*, making the clausula an instance of the regular (#) $\acute{S}\acute{S}\#$ . If this analysis is accepted, then the exclusion of # $\acute{S}\acute{S}\#$  in Ausonius becomes statistically significant ( $p = .0471$ ) in comparison with, e.g., Lactantius' *cursus mixtus* works.

Whatever may be the significance of the position of Ausonius, Table 6 nevertheless reveals an important discovery: there is a perfect implicational scaling of the linguistic types of deviation in *cursus mixtus* (and *cursus*) texts: the deviation resulting from # $\acute{S}\acute{S}\#$  occurs in no *cursus mixtus* or *cursus* text; substitution of  $\acute{S}$  for  $\bar{S}$  in pro-antepenultimate pretonic position (# $\acute{S}\acute{S}\#$ ) implies substitution of  $\acute{S}$  for  $\bar{S}$  in final position ([#] $\acute{S}\acute{S}\#$ ), which implies substitution of  $\acute{S}$  for  $\bar{S}$  in tonic syllables ([#] $\acute{S}\acute{S}\#$  or # $\acute{S}\acute{S}\#$ ). In other words, if any type of deviation occurs anywhere to the left in a *cursus mixtus* (or *cursus*) work, all the deviations to its right occur both in that work and also in all the works below it.

The vertical axis of Table 6 defines a hierarchy of strictness in regard to syllable quantity in clausulae along which the works are ranged. Analysis of the individual positions of the works on this hierarchy will require detailed assessment of other aspects of the language, styles, and rhythmical preferences of the authors and the specific natures of their works. This task is beyond the scope of the present paper.

The horizontal axis of Table 6 defines a hierarchy of phonological environments involving location relative to stress, word boundaries, and quantitative shape of the word. The environments to the right are more conducive to the substitution of  $\check{S}$  for  $\bar{S}$  than those to the left, and, in fact, such substitution seems to spread in a strict sequence along this hierarchy.

### III. THE HIERARCHY OF PHONOLOGICAL ENVIRONMENTS

The ordering of the phonological environments in Table 6 can in part be predicted from linguistic considerations. We need to begin by formulating premises to specify how the erosion of phonological contrasts of syllable quantity might affect "errors" in composition. First, and most obviously, the substitution of  $\check{S}$  for  $\bar{S}$  should be most likely to occur in environments in which actual phonological lengthening,  $\check{S} \rightarrow \bar{S}$ , is most likely to take place. Quite generally in the languages of the world added duration is one of the prime phonetic cues of stress, so that stressed syllables, *ceteris paribus*, are phonetically longer than unstressed syllables of the same segmental structure. As far as short vowels in stressed syllables are concerned, such tonic lengthening is presupposed by the diphthongizations seen in Romance languages. The verse equivalent of the substitution of  $\check{S}$  for  $\bar{S}$  in stressed syllables seen in clausulae is readily found in the Christian poets, e.g., Cyprian of Gaul *miser*, and in inscriptions, e.g., *âmor* CE 1993, *pâter* CE 1975, *bôni* CE 2094.<sup>7</sup> Furthermore, at least for African Latin, we possess a number of ancient testimonia pointing fairly clearly to tonic lengthening (see section 4). Additionally, above and beyond any actual durational motivation, the substitution of  $\check{S}$  for  $\bar{S}$  would be encouraged by a tendency to interpret stress as the prime signal of phonological prominence.

Outside of tonic syllables, direct phonetic motivation for the substitution of  $\check{S}$  for  $\bar{S}$  in terms of added duration or psycho-acoustic reanalysis of prominence is not available. In fact pre- and post-tonic environments are conducive to shortening. One need only think of Vulgar Latin syncope of the type *calfacio* < *calefacio* (< *calēfacio*), *frigidus* < *frigidus*. Many instances of the substitution of  $\check{S}$  for  $\bar{S}$  can be found in the verse of Dracontius,

<sup>7</sup>It remains to be determined whether in this material substitution of  $\check{S}$  for  $\bar{S}$  in stressed syllables occurs at a higher rate in disyllables than in antepenultimate tonic syllables. If so, we could then anticipate the implicational relation between the two environments evidenced by the clausula data.

The only exception to perfect implicational scaling is the occurrence of (#)SSS# in Minucius Felix without the concomittant occurrence of (#)SS#. Furthermore, the ambiguous #SSS# from the *velox* always occurs along with (#)SS#. Linguistically it is not clear why #SSS# should occupy the position it does in Table 8, and this deviation may be influenced by analogical processes operating within the *cursus mixtus* system arising from the competition of cretic-spondee, ditrochee, and dispondee forms.

<sup>9</sup>Cases such as *Luxorius nēgōtium*, *Dracontius inmōbilis* attest a further stage in the erosion of quantity distinctions.



TABLE 8  
Complete implicational scaling  
of quantity deviations by type and environment

	#ŠŠŠ#	#ŠŠSS#	(#)ŠŠŠ#	(#)ŠŠ#	#ŠŠŠŠ#	(#)ŠŠSS#	#ŠŠ#
Ausonius	—	—	—	—	—	—	+
Cyprian	—	—	—	—	—	+	+
Symmachus	—	—	—	—	—	+	+
Arnobius	—	—	—	+	+	+	+
Minucius Felix	—	—	+	—	+	+	+
Ammianus	—	—	+	+	+	+	+
Ps.-Apuleius	—	+	+	+	+	+	+
<i>Pan. Lat.</i>	—	+	+	+	+	+	+
Lactantius:							
<i>cursus mixtus</i>	—	+	+	+	+	+	+
indeterminate	—	+	+	+	+	+	+
Jerome	—	+	+	+	+	+	+
Ambrose	—	+	+	+	+	+	+
Augustine	—	+	+	+	+	+	+
Lactantius:							
metrical	+	—	+	+	+	+	+

#### IV. AFRICA AND GAUL: POSSIBLE EVIDENCE FOR A STATISTICALLY DEFINED ISOGLOSS

It is notoriously difficult to establish dialect differences in late Latin inscriptions, and all the more so in literary works.<sup>10</sup> While the status of Afri-

<sup>10</sup>Devine and Stephens (above n. 2, 72 f.) write, "Vulgar Latin is a fine example of how dangerous our usual simplified and schematic approach to historical linguistics can be. . . . It is basically unsound to use the term vulgar Latin in such a way as to suggest a monolithic system, when in fact there must have been numerous gradations of vulgarity stretching from what could almost be termed bad (i.e., semi-Latinized) Oscan [or Punic!] to upper class urban colloquial. These types were distributed socially and, although it is not always easy to prove, regionally, and there must have been a good deal of bidialectalism with associated phonosyntactic reflexes. . . . When vulgar Latin is viewed as a spectrum, as it should be, questions of relative chronology become more complex and therewith more historical. Changes which later became standard in part of the Romance area may still be substratum based, starting as regionally and specially socially restricted rules." Cf. G. Reichenkron (*Historische Latein-Altromanische Grammatik* [Wiesbaden 1965] 292): "Es soll nicht gelegnet werden, dass mancher der Umgangssprache zuzuschreibende Zug in der einen Provinz früher, in der anderen später auftrat. Gerade das Afrika des 5. Jhs. n. Chr. bietet ja mit den 'Tablettes Albertini' ein beredtes Beispiel, wo

can Latinity in particular has been the subject of considerable debate,<sup>11</sup> the ancient sources are in striking agreement in singling out African speakers of Latin for false quantities. These passages are well known, but worth repeating here.

*Nunc iam quibus modis barbarismus fiat . . . temporis, ut quidem dicunt piper producta priore syllaba, cum sit brevis, quod vitium Afrorum familiare est; . . . temporis, ut si quis dicat orator correpta priore syllaba, quod ipsum vitium Afrorum speciale est.* Consentius 5.391.25–392.12 Keil

*Afrae aures de correptione vocalium vel productione non iudicant.* Augustine *De doctrina christiana* 4.24

*Nam possemus hic putare os esse, ab eo quod sunt ora; non os correpte ab eo quod sunt ossa.* Augustine, *Enarratio in Psalmum* 138.20.

Giuliano Bonfante adds the African grammarian Terentianus Maurus:<sup>12</sup>

*AU et EU, quas sic habemus cum Graeis communiter, corripit plerumque possunt temporum salvo modo.* 6.467 ff. Keil

The entire passage 467–493, however, is difficult to interpret phonologically, and, at any rate, does not state that such correction is an African phenomenon.

It is possible, of course, that such comments in ancient authors reflect a commonplace or a stereotype rather than a (statistically defined) isogloss. Examples of false quantities, however, do abound in the grave inscriptions of Africa, e.g., *vide CE 1928, plurima CE 2066, fūeris, amīcis, mērita, bōni CE 2094, votīs ōptare CE 1922*. But this inscriptional evidence could reflect a sociolinguistic phenomenon rather than a geographical one. Certainly the loss of quantity spreads at a greater rate in lower sociolinguistic strata as the Pompeian graffiti show. The question is, how do comparable strata compare in the different provinces in the same periods?

The treatment of prose clausulae provides another potential source of

zunächst einmal eine Anordnung von Urkunden vorkam, wie sie in diesem Typus etwa in Gallien erst zwei Jahrhunderte später zur Zeit des sog. Merowingerlateins überliefert ist. Genauso wartet in diesen 'Tablettes Albertini' die Umgangssprache mit neuen Formen auf, die an anderen Orten erst später nachweisbar sind."

<sup>11</sup>In favor of a special *Africitas* are, *inter alios*, Michael Zink (*Der Mytholog Fulgentius. Ein Beitrag zur römischen Literaturgeschichte und zur Grammatik des afrikanischen Lateins* [Würzburg 1867]), A. Budinszky (*Die Ausbreitung der lateinischen Sprache* [Berlin 1881]), and, of course, K. Sittl (*Die lokalen Verschiedenheiten der lateinischen Sprache, mit besonderer Berücksichtigung des afrikanischen Lateins* [Erlangen 1882]). Against *Africitas* in literature are E. Norden (*Die antike Kunstprosa* 2 [Stuttgart 1958]) and W. Kroll ("Das afrikanische Latein," *RhM* 52 [1897] 572 ff.). "Tatsächlich gibt es heute kaum noch einen klassischen Philologen, der an das afrikanische Latein in der überlieferten römischen Literatur [my emphasis] glaubt, und zwar mit Recht," concludes Reichenkron ([above, n. 10] 288).

<sup>12</sup>G. Bonfante, "Il sardo *kenápura* e la quantità latina," *Parola del Passato* 50 (1956) 346–358.

evidence for the advanced position of African Latin in regard to the loss of syllable quantity. In the cases to be discussed in 4.1, 4.3, and 4.4 the *cursus mixtus* works of the African authors Cyprian, Arnobius, Lactantius, and Augustine are shown to have higher rates of quantity deviations than the *cursus mixtus* works of the authors from Gaul, the *Panegyrici Latini*, Ausonius, and Ennodius. To the extent that the African authors do not have literary reasons (e.g., differences in genre) or social motives (perhaps connected with the contemporary position of Christianity) for adopting a lower sociolinguistic register or less formal phonostyle as the basis for their prose works, it would seem that such differences in the treatment of quantity could reflect a dialect difference between African and Gallic Latin.

4.1 (#)ŠŠŠ#—The overall rate of the substitution of Š for Š̄ in (#)ŠŠŠ# in the African authors' *cursus mixtus* works is 20.13%, in the Gallic writers only 5.15%. This difference is statistically significant with chi-square = 11.9821.

4.2 #ŠŠŠ#—There is no significant difference between the African and the Gallic writers in the rates of substitution.

4.3 #ŠŠŠŠ#—The overall rate of substitution is 5.54% in the African authors but only 1.39% in the Gallic. This difference is statistically significant with chi-square = 15.9896.

4.4 (#)ŠŠ#—The overall rate of the substitution of (#)Š̄Š# for (#)ŠŠ# in the *tardus* is 9.77% in the African authors but only 2.49% in the Gallic. This difference is statistically significant with chi-square = 15.9896.

4.5. #ŠŠ#—The rate of the substitution of #Š̄Š# for #ŠŠ# in the *planus* in the Gallic authors is remarkably high:<sup>13</sup> 45.59%; in the African authors the rate is still quite high, but only half that of the Gauls: 22.57%. This difference is statistically significant with chi-square = 9.1669. Since the implicational scaling of Tables 6 and 8 gives some support to tonic position in disyllables as the most conducive to the substitution of Š for Š̄ (see also above, note 7), the significantly greater rate in this environment observed in the Gallic authors might be in part explained by the later chronology of some of them, rather than as a purely dialectal feature.

#### V. ABSENCE OF CORRELATIONS OF CLAUSULAR TYPE AND QUANTITY DEVIATIONS

I will conclude this study by establishing the independence of the type of clausula and the rates of quantity deviation in the same linguistic environ-

<sup>13</sup>In fact, it appears that among Gallic writers these sub-types of clausulae could be interpreted as having an *anceps* element in this position. The absence of quantitative contrast, however, is linguistically conditioned, so that a structural reanalysis of the clausular system is not necessarily implied.

ment. This independence, of course, is what we would expect if the quantity deviations are, at least in large part, phonologically motivated. All of the *cursum mixtum* works studied will be treated as a corpus.

It would be quite invalid simply to compare the rates at which deviations occur in the *planus* and *tardus* types of clausulae, for such a procedure would ignore the possible skewing effects of the phonological structures of Latin words. Fortunately the same phonological environments occur in different clausular types in the following cases. The segment (#)SSS# occurs initially in both the *planus* type 1.a.2 and the *tardus* types 2.a.2 and 2.b.2. This word shape will permit the test to encompass the substitution of Š for S both in tonic and non-tonic syllables.

5.1 (#)SSS#—The substitution occurs at a rate of 16.6% in the *planus* and at a rate of 13.19% in the *tardus*. This difference is not statistically significant, with chi-square = 1.656. Since there is no significant difference between the two rates, we conclude that it is the phonological environment rather than considerations of resulting metrical form that is salient.

5.2 (#)SSŠ#—The rate of substitution is 6.27% in the *tardus* and 3.62% in the *planus*. This difference is not statistically significant, with chi-square = 1.9679. Again the difference of clausular type is not salient.

5.3 The *anceps* syllable of the *tardus*—In the absence of any appreciable correlation in the phonological structure of Latin words between the frequencies of heavy and light syllables in the environments #-SS# and #S-SS#, it would be expected that the *tardus* types 2.a.1 and 2.b.1, on the one hand, and the types 2.a.2 and 2.b.2, on the other, would stand in the same ratio: in other words, the position of the caesura in the clausula should not directly affect the frequencies of heavy and light syllables in the second stress position of the *tardus*. This expectation is confirmed. The rate of light syllables is 30.76% in the *tardus* type (#)SSS#SSS# and 32.8% in the type (#)SS#SSSS#. This small difference is not statistically significant, with chi-square only 0.38.

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