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Cantus Firmi for Species Counterpoint: Catalog and Characteristics

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CANTUS FIRMI FOR SPECIES COUNTERPOINT: CATALOG AND CHARACTERISTICS

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INTRODUCTION

In counterpoint texts (and perhaps courses) based on the species approach, the cantus firmus itself often appears as a magical fixed force to which further melodic strands are to be added. Seldom is the cantus the subject of discussion; at best it may be linked with aspects of melodic motion that are classified as typical of the counterpoint line(s). (And there is a wide diversity of opinion about what is or is not appropriate for each particular species, especially second through fifth.) While an author occasionally encourages a student to write some cantus firmi, generally there is little said about specific characteristics and, while some cantus firmi may be given as model examples, there is seldom a collection of several to serve as models.

Therefore this paper has two objectives. The first is to provide a catalog of 191 cantus firmi (appropriate for species counterpoint), found in eight selected counterpoint books, to give an overview of possibilities from diverse sources. Each of the cantus firmi was numerically encoded and assigned a catalog entry number. The catalog (Table 1) and further explanations appear later. The catalog presents an interesting perspective on cantus firmus melodic practice; in addition, documentation of those tunes that appear in more than one book is included. Further, the catalog provides a reference to which other cantus firmi (from texts, or those composed by teachers or students) may be compared, or from which examples may be selected.

The second objective is to compare characteristics of the catalogued cantus firmi with the principles governing the writing of cantus firmi encountered in the text by Salzer and Schachter—a source book that does indeed contain a thorough presentation of preferred attributes. Thus the list of principles taken from their text is provided and each principle is given an identifying letter label (Table 2).

Cross references between the cantus firmi in the catalog and exceptions to the stated principles also are provided. Comments regarding details of the various characteristics and comparisons between the essen-

tially *a priori* principles in Salzer and Schachter and the *a posteriori* observation of data from the catalogued cantus firmi follow Table 2. As simple as cantus firmi sometime appear, delineating their attributes proves to be a provocative challenge. The comparison of the cantus firmi to the Salzer/Schachter principles supplies a basis for this problem, and leads to suggestions for possible modifications to or clarifications of some of the principles.

SOURCES

The eight books from which the cantus firmi are taken represent broad historical, philosophical, and pedagogical spectra. They are all predicated on the species approach. While not meant to be exhaustive, the choices reflect reasonably likely sources for teachers seeking examples. In chronological order, the works are those by Fux (1943, original 1725), Albrechtsberger (1955, original 1790), Cherubini (190-?, original 1835), Schenker (1910), Jeppesen (1939), Roberts and Fischer (1967), Davis and Lybbert (1969), and Salzer and Schachter (1969). Abbreviated references employed in the catalog, with numbers of cantus firmi from each, are Fux (8), Alb (3), Che (37), Sch (5), Jep (20), R/F (106), D/L (10), S/S (23).

QUALIFICATIONS FOR CANTUS FIRMI

The cantus firmi chosen for the catalog are those dealing with species counterpoint. Further requirements for inclusion are that the tunes either 1) exemplify complete, valid cantus firmi; 2) serve as possibilities for employment, by a student, in species exercises; or 3) serve as the cantus in models of completed species exercises. To stay within a practical pedagogical length, I decided to exclude tunes having more than 21 notes; this eliminated 15 of the tunes listed in the Cherubini appendix of subjects.

INFORMATION IN THE CATALOG

The catalog (Table 1) is presented in a typical two-dimensional format of rows and columns. Each row contains information about one cantus. The information appears in the respective columns, left-to-right, and includes:

Entry Number. The tunes are encoded numerically, ordered (explanation of procedure follows), and numbered (#1-191; when tunes are referred to in this article the numbers are preceded with the # sign). If a tune appears in two (or more) of the selected sources, it is credited to the author of the

earlier-published work. Its appearance in a later book is acknowledged by listing that source also, but it is not given another entry number and it is not re-written in the encoded version. For example, see catalog entry #21. The original source (Schenker) is indicated, and since the tune is also in another book (Salzer and Schachter), this is acknowledged on the next line. If a citation appears in the later-published book, it is indicated—otherwise "No Source Cited" is printed in the catalog.

If a tune appears in two (or more) sources but the later source includes either a modal or chromatic variant, the entry number of the original is followed by a lower-case a and the variant is labeled b. For example see #12a, a Lydian tune (by Fux) that is followed by b since, in this case, it appears in three other sources with modal variation from an Ionian signature. For an example followed by a chromatic variant see #43a and b, noting that the encoded tune is written out for both.

Author. A designation appears in each row of the catalog, using the aforementioned abbreviated references.

Use. Entries in this column present information on the context in which each cantus appears in its source book. The letter "C" indicates that the cantus appears alone (without an accompanying counterpoint) as a complete, appropriate cantus or that it is for a student to employ in species exercises. "X" indicates that it serves as the cantus of a completed species exercise and "Xs" signify that it appears as the cantus of two or more such exercises.

Mode. The assignment of mode is based on the relationship between the author's given key signature and the tonic, or final. Abbreviations employed for Dorian, Phrygian, Lydian, Mixolydian, Aeolian, and Ionian are DR, PH, LY, MX, AO, and IO.

Cantus. (Encoding and Ordering). To facilitate ordering and comparison, scale-degree numbers, using Arabic numerals, are used to display each cantus in the catalog. The tonal center is assigned 1. (In this article, scale degrees will be underlined digits.) If a tonic appears in both a lower and higher register, the lower octave is 1 and the higher is 8. Pitches in the register below the assigned 1 are preceded with a minus sign; thus, assuming C is tonic, the succession C4 D4 E4 C4 A3 B3 C4 is encoded 1 2 3 1 -6 -7 1. The lowest note found in relation to a 1 is a -2; the highest is 10. When accidentals are found within cantus firmi they also precede the numerical scale degree in the encoded version (but do not influence the designation of mode). Indication of the specific tonal centers or octave registers is not included in the catalog.

The determination of the placement order of each cantus firmus (and thus the resulting catalog entry number) is based on a set of priorities for each note in a cantus, taken one at a time, left to right:

1. Scale degree 1 has precedence over any other.

2. A note higher than 1 has precedence over a note lower than 1.

3. A degree number closer to 1 has precedence over one farther from 1. Application of these priorities results in the following ordering, for example, of initial three-note segments: 1 2 3 precedes 1 2 4, which precedes 1 -7 1, which precedes 1 -6 1, which precedes 5 3 4.

Further considerations:

4. In appearances of a tune in two or more sources, the listing order is chronological, by date of publication, from earlier to later. As mentioned in the Mode category, lower-case letters follow the catalog entry number when a tune is duplicated but the mode is changed.

5. Chromatic variants are disregarded except where a complete tune is duplicated; then the unaltered form appears before the altered, unless priority 4 supersedes.

6. Modal variants, by one author, of a single tune appear in the order Dorian, Phrygian, Lydian, Mixolydian, Aeolian, Ionian.

Exceptions. For any exceptions to one or more of the Salzer and Schachter principles (as listed in Table 2), the letter label of the respective principle appears in the right-most column of the catalog (labeled Exceptions). If there is more than one exception to a principle within a tune, the number of exceptions precedes the letter label. For an example see catalog #12 where "2M" indicates that there are two places in the cantus where an exception to principle M (avoid two consecutive leaps in the same direction) occurs.

Table 1 (the catalog) appears next. It is followed by Table 2, in which the principles from Salzer and Schachter are listed and labeled. Table 2 also includes cross references from Table 1 since information about cantus firmi is provided when exceptions to any principle are noted.

TABLE 1.
Catalog of Cantus Firmi

Entry Number	Author	Use	Mode	Cantus																			Exceptions
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1	R/F	X	IO	1	2	1	3	2	5	4	3	1	2	1											
2	R/F	C	PH	1	2	1	3	2	6	4	1	3	2	1											I, M, N, V
3	R/F	X	PH	1	2	1	3	6	5	4	3	1	2	1											M
4	Che	C	IO	1	2	1	4	3	6	5	3	4	2	6	4	2	3	2	1						H, I, M, N, W
5	Che	C	IO	1	2	1	4	3	6	5	4	3	4	3	2	1									W
6	R/F	C	IO	1	2	1	4	5	3	4	3	2	1												L
7	Jep	C	DR	1	2	1	5	4	3	2	1														I
8	R/F	C	PH	1	2	1	8	7	5	6	4	3	2	1											
9	Che	C	IO	1	2	1	–6	1	4	3	2	1													M, N
10	Che	C	IO	1	2	1	–6	1	4	3	6	5	2	3	2	1									I, M, N, W
11	R/F	X	DR	1	2	3	1	–7	–5	1	2	3	2	1											H, L, V
12a	Fux	Xs	LY	1	2	3	1	–6	–7	1	5	3	1	2	1										I, 2M, N, P, Q, R, U
12b	Che	C	IO	No source cited																					
	Sch	C, Xs		Fux cited																					
	S/S	C		Fux cited																					
13	R/F	C	PH	1	2	3	1	–6	–7	1	–7	3	2	1											H, M
14	R/F	C	PH	1	2	3	1	–6	–7	2	4	3	1	2	1										I, 2M
15	R/F	X	PH	1	2	3	1	–6	–7	–5	1	2	–7	3	2	1									H, I, L, M
16	R/F	X	LY	1	2	3	1	–6	–5	1	2	1													L
17	Che	C, Xs	IO	1	2	3	4	2	3	1	–7	2	–7	1	2	3	4	2	3	2	1				C, H, I, R, U, V
18	R/F	C	DR	1	2	3	4	2	3	4	5	3	2	1											W
19	R/F	X	PH	1	2	3	4	2	b5	3	4	2	1												N, V
20	R/F	X	PH	1	2	3	4	2	–6	6	2	4	3	2	1										I, M, N, U
21	Sch	C	IO	1	2	3	4	5	2	4	3	2	1												
	S/S	C		No source cited																					
22	S/S	Xs	IO	1	2	3	4	5	3	4	2	1													
23	Che	C	IO	1	2	3	4	5	6	2	5	3	6	5	4	3	2	1							H, N, 2O

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Exceptions
24	R/F	C	IO	1	2	3	4	5	6	4	2	3	2	1											M, O
25	D/L	C, Xs	AO	1	2	3	4	5	6	5	3	2	1												I, J, O
26	R/F	X	DR	1	2	3	4	–7	1	–4	–5	1	2	1											L
27	D/L	C, Xs	IO	1	2	3	5	6	4	3	2	1													J
28	R/F	X	AO	1	2	3	5	6	4	5	3	2	1												
29	Cha	C	AO	1	2	3	6	4	5	4	3	2	1												
	R/F	X		No source cited																					
	S/S	X		No source cited																					
30	S/S	C, Xs	IO	1	2	3	6	5	1	2	4	3	2	1											P
31	R/F	X	PH	1	2	3	6	5	3	4	2	1													
32	S/S	C	AO	1	2	3	–3	–4	–6	–5	2	1	–7	1											
33	Sch	C, Xs	IO	1	2	4	3	4	5	6	5	3	2	1											
	S/S			Schenker cited in 7 of 9 instances																					
34	Sch	C, Xs	AO	1	2	4	3	4	8	7	6	5	4	6	5	3	2	1							P
35	Fux	Xs	IO	1	2	4	3	5	4	3	2	1													
	Cha	C		No source cited																					
36	S/S	X	IO	1	2	4	3	6	4	3	2	1													
37	S/S	C	AO	1	2	4	3	6	5	4	1	3	2	1											
38	S/S	C, Xs	AO	1	2	4	3	6	5	4	2	3	2	1											
39	R/F	C	IO	1	2	4	3	6	5	4	3	2	1												O
40	Cha	C	IO	1	2	4	3	6	5	4	3	2	5	4	3	6	4	5	4	3	2	1			C, H, I, V
41	R/F	X	LY	1	2	4	6	5	3	2	1														J, M
42	Alb	C, Xs	IO	1	2	5	3	1	8	6	7	3	6	4	5	1	2	1							I, K, M, 2N
	Sch	C		Albrechtsberger cited																					
43a	Jep	C, Xs	AO	1	2	–7	1	2	1	4	3	2	1												
43b	R/F	Xs	AO	1	2	–7	1	b2	1	4	3	2	1	No source cited											
44	Cha	C	IO	1	2	–5	1	2	3	–6	–5	–7	–6	2	3	2	1								H, I, 3L
45a	Fux	C, Xs	DR	1	3	2	1	4	3	5	4	3	2	1											
	Jep	C, Xs		Fux cited																					
	R/F	C, Xs		No source cited																					

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus																			Exceptions
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
45b	Che	C	AO	No source cited																			
	Sch	Xs		Fux cited in 11 of 12 instances																			
	S/S	C, Xs		Fux cited in 4 of 12 instances																			
45c	R/F	X	PH	No source cited																			
45d	R/F	C	MX	No source cited																			
46	Che	C	AO	1	3	2	1	4	3	6	4	2	3	1	4	3	4	3	2	1				C, I, M, N, R, U, V
47	R/F	C	AO	1	3	2	1	5	3	4	3	2	1											
48	R/F	X	AO	1	3	2	1	5	4	3	6	3	2	1										L
49	Sch	C, X	AO	1	3	2	1	5	#6	7	4	3	2	5	4	3	2	1						2L, Q, R, V
50	S/S	C	AO	1	3	2	3	4	5	3	2	1												
51	Jep	C	IO	1	3	2	3	4	5	6	2	3	2	1										
52	Fux	X	AO	1	3	2	3	5	6	5	4	3	2	1										O
	R/F	C		No source cited																				
53	D/L	C, Xs	AO	1	3	2	4	3	1	5	4	3	2	1										W
54	Che	C	IO	1	3	2	4	3	1	–6	1	–7	–5	–6	–7	1	2	3	2	1				C, I, M, N, O, W
55	Fux	Xs	AO	1	3	2	4	3	5	6	5	4	3	2	1									O, W
	Che	C		No source cited																				
	Sch	C		Fux cited																				
56	R/F	C	AO	1	3	2	4	3	6	5	4	3	2	1										O, W
57	R/F	X	IO	1	3	2	5	3	4	3	2	1	–6	2	1									I, Z
58	R/F	X	LY	1	3	2	5	3	6	4	5	3	2	1										I, N, W
59	Che	C, Xs	IO	1	3	2	5	3	6	5	4	3	6	4	2	1								H, I, M, 2N
	Sch	C, Xs		Cherubini cited																				
60	R/F	X	MX	1	3	2	5	6	4	5	3	2	1											L
61	D/L	C, Xs	IO	1	3	2	5	6	5	3	4	2	1											L
62	S/S	C, X	IO	1	3	2	6	5	3	4	3	2	1											
63	S/S	X	IO	1	3	2	6	5	4	3	5	4	2	1										
64	R/F	X	PH	1	3	2	–7	1	4	5	3	2	1											L
65	R/F	C	PH	1	3	4	2	1	–6	–4	4	2	1											H, I, M, N, Q
66	S/S	Xs	AO	1	3	4	2	3	6	4	5	3	2	1	Roth cited									I

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus																			Exceptions
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
67	R/F	X	LY	1	3	b4	2	–7	1	3	2	1													M, R
68	R/F	X	LY	1	3	b4	3	2	5	6	b4	3	2	1											L, V
69	R/F	X	DR	1	3	4	3	2	–5	–7	1	4	3	2	1										H, P, 2Q, 2R, V
70	R/F	C	IO	1	3	4	3	5	–5	1	2	1													L, N
71	R/F	C	AO	1	3	4	3	6	5	3	4	3	2	1											U, V
72	R/F	C	PH	1	3	4	3	6	5	4	3	2	1												O
73	R/F	X	IO	1	3	4	5	3	6	5	3	4	2	1											I
74a	Fux	Xs	IO	1	3	4	5	3	6	5	3	4	3	2	1										U
	Che	C		No source cited																					
	Sch	C, Xs		Fux cited																					
	Jep	C, Xs		Fux cited (misprint in Jep. on p. 107; footnote 1: "Cantus firmi numbers 1, 6, and 20" should read "1, 6, and 19."																					
	S/S	C, Xs		Fux cited in 1 of 3 instances																					
74b	R/F	C	DR	1	3	4	5	3	b6	5	3	4	3	2	1	No source cited									
75	R/F	C	IO	1	3	4	5	3	6	5	4	3	2	1											O
76a	Jep	C, Xs	DR	1	3	4	5	4	3	2	1														I, J
	R/F	Xs		No source cited																					
76b	R/F	X	AO	No source cited																					
77	D/L	C, X	IO	1	3	4	5	6	5	3	4	2	1												
78	R/F	C	MX	1	3	4	6	5	7	6	4	3	2	1											Q, R
79	R/F	C	DR	1	3	4	7	6	7	4	5	4	3	2	1										H, Q, R
80	R/F	X	IO	1	3	5	3	6	5	3	4	3	2	1											I, M, N, U
81	R/F	X	AO	1	3	6	5	2	4	3	2	1	(from Prout; no source cited)												M
82	R/F	X	LY	1	3	6	5	3	2	3	b4	3	2	1											M, U
83	R/F	Xs	DR	1	3	b6	5	4	1	3	2	1													M
84	R/F	X	IO	1	3	6	5	4	3	2	1	(from Prout; no source cited)													J, M, O
85	R/F	X	DR	1	4	2	3	1	5	4	3	2	1												
86	Che	C	AO	1	4	2	3	2	5	4	2	–7	1	2	3	2	1								I, M, U, V
87a	S/S	Xs	AO	1	4	2	3	4	5	3	2	1													
87b	S/S	X	IO																						
88	R/F	Xs	MX	1	4	2	5	3	4	3	2	1	–6	2	1										I, N, W, Z

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus																				Exceptions
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
89	Che	C, Xs	IO	1	4	2	5	3	6	5	#4	5	3	4	2	3	4	3	2	1					C, I, N, 2W
	Sch	C, X		Cherubini cited																					
90	R/F	C	MX	1	4	2	5	–5	–6	1	2	3	2	1											I, N
91	R/F	C	DR	1	4	3	1	2	3	4	5	3	2	1											
92a	Fux	Xs	MX	1	4	3	1	4	6	5	8	6	4	5	3	2	1								I, L, 2M, 2N
92b	Che	C	IO	No source cited																					
	Sch	C, X		Fux cited																					
93	R/F	C	DR	1	4	3	2	1	5	b6	5	4	1	3	2	1									L
94	S/S	C	AO	1	4	3	2	1	–7	3	2	1													
95a	R/F	X	MX	1	4	3	2	3	4	6	5	1	3	2	1										P
95b	R/F	X	AO																						
96	Sch	C	IO	1	4	3	2	3	6	5	7	8	6	3	5	4	3	2	1						I, M, N, V
97a	R/F	X	PH	1	4	3	2	3	–6	2	1														Z
97b	R/F	X	MX																						
98	R/F	C	MX	1	4	3	2	4	5	6	5	3	2	1											
99a	R/F	X	MX	1	4	3	2	5	3	4	5	6	3	2	1										L
99b	R/F	X	PH	1	4	3	2	b5	3	4	5	6	3	2	1										
100	R/F	X	MX	1	4	3	2	5	4	2	3	1	2	1											W
101	Alb	Xs	AO	1	4	3	2	5	4	2	3	1	5	4	3	1	2	1							H, I
	Sch	C, Xs		Albrechtsberger cited																					
102	R/F	X	MX	1	4	3	4	6	5	1	3	2	1												P
103	R/F	C	PH	1	4	3	4	6	5	7	6	4	3	2	1										Q, R
104	R/F	C	MX	1	4	3	4	6	5	8	6	4	3	2	1										M, N, Q
105	Che	C	IO	1	4	3	5	1	–7	–6	2	3	2	–7	1	–6	–7	–5	–6	2	1	3	2	1	C, I, 2L, Q, R
106	Che	C	IO	1	4	3	5	6	5	#4	5	3	4	2	–7	1	–6	2	3	4	2	1			C, I, L, M, R, V
107	Che	C	IO	1	4	3	6	5	2	–7	3	–6	–7	1	4	3	2	1							I, L, M, N, Q, R, V, W
108	S/S	C, Xs	IO	1	4	3	6	5	3	4	3	2	1												W
109	Che	C	AO	1	4	3	6	5	8	7	6	5	6	4	3	2	5	3	2	1					C, I, W
110	Che	C, Xs	IO	1	4	3	–6	2	3	4	3	1	5	#4	6	5	5	3	4	2	1				C, I, L, P, T
111	Che	C	IO	1	4	5	1	2	5	6	2	3	6	7	8	9	8								I, 3L, Q, W, X

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus																			Exceptions
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
112	R/F	C	IO	1	4	5	1	4	3	2	–7	3	2	1											I, L, R
113	Che	C	AO	1	4	5	3	1	2	3	6	4	5	4	3	2	1								I, L, M
114	Che	C	AO	1	4	5	3	1	2	3	6	4	5	4	#3	4	7	6	5	6	4	3	2	1	C, I, L, R
115	R/F	C	IO	1	4	5	3	5	4	3	2	1													H, L
116	D/L	C, X	AO	1	4	5	3	6	4	5	3	2	1												I, L, N, V
117	R/F	X	IO	1	4	5	6	4	2	3	4	2	1												L, M
118	R/F	X	IO	1	4	5	6	b7	5	8	10	9	8												2L, M, N, Q, R, X
119	R/F	X	LY	1	5	2	3	6	5	3	4	2	3	2	1										I, W
120	Jep	C, Xs	AO	1	5	2	4	3	2	1															C, N
121	R/F	X	AO	1	5	3	1	2	3	4	3	2	1												M, N
122	D/L	C, Xs	AO	1	5	3	4	2	–7	1	3	2	1												I, M
123	Jep	C, Xs	MX	1	5	3	6	5	4	3	2	1													N, O
	R/F	Xs		No source cited																					
124	R/F	X	DR	1	5	4	2	3	1	–7	–7	4	2	1											I, T
125a	Jep	C, Xs	MX	1	5	4	2	3	4	3	2	1													
	R/F	Xs		No source cited																					
	S/S	C		Jeppesen cited																					
125b	R/F	X	LY	1	5	4	2	3	b4	3	2	1	No source cited												
125c	R/F	Xs	LY	1	5	b4	2	3	b4	3	2	1	No source cited												
125d	S/S	Xs	AO	1	5	4	2	3	4	3	2	1	No source cited												
126	R/F	C	DR	1	5	4	3	1	2	1	–7	3	2	1											
127a	Jep	C, Xs	DR	1	5	4	3	2	1	3	2	1													
	R/F	X		No source cited																					
	S/S	Xs		No source cited																					
127b	S/S	Xs	AO	Jeppesen cited in 1 of 11 instances																					
128	R/F	C	DR	1	5	4	3	2	–7	1	2	–6	–7	1	3	2	1								R
129	R/F	C	DR	1	5	4	5	7	6	7	5	3	2	1											H, M, Q, R
130	S/S	C, Xs	AO	1	5	4	6	5	3	4	3	2	1												
131	R/F	C	PH	1	5	6	4	5	3	4	3	2	1												L, W
132a	Jep	C	DR	1	5	b6	5	4	1	3	2	1													L

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus	Exceptions
				1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	
	R/F	X		No source cited	
132b	R/F	X	MX	1 5 6 5 4 1 3 2 1 No source cited	
133	R/F	C	PH	1 5 6 5 4 3 2 4 3 2 1	L, V
134a	Jep	C, Xs	IO	1 5 –5 –6 –7 1 2 3 4 3 2 1 (Mistake in footnote attributes this to Fux; see #74a, Jep.)	O, R
	R/F	X		No source cited	
134b	R/F	X	LY	1 5 –5 –6 –7 1 2 3 b4 3 2 1 No source cited	
135	Jep	C, Xs	AO	1 6 5 3 4 3 2 1	
	R/F	X		No source cited	
136	R/F	C	LY	1 8 7 5 6 b4 3 2 1	
137	R/F	C	AO	1 8 7 5 6 5 3 2 1	
138	Jep	C, Xs	AO	1 8 7 5 6 5 4 3 2 1	O
	R/F	X		No source cited	
139	R/F	C	DR	1 8 7 6 7 3 4 5 2 4 3 2 1	
140	Jep	C, Xs	PH	1 –7 1 2 3 4 –7 2 1	
	R/F	Xs		No source cited	
141	R/F	X	DR	1 –7 1 4 2 5 6 4 2 1 (from Prout; no source cited)	I, L, M, N
142	R/F	C	IO	1 –7 1 –6 –5 –4 –5 –6 –b7 –6 3 2 1	
143	Che	C	AO	1 –#7 1 –5 1 2 3 4 5 2 3 4 3 2 1	L, Q, V
144	R/F	X	DR	1 –7 1 –4 –5 –6 –7 1 3 2 1	Q, R
145	R/F	X	AO	1 –7 2 4 2 1 –6 3 2 1	I, M, N
146	Jep	C	PH	1 –7 3 2 –6 –7 1 –4 1	Y(abc), Z
147	R/F	C	DR	1 –7 3 4 5 7 5 4 3 2 1	J, L, 2Q, R
148	Che	C	IO	1 –7 –6 1 2 1 –7 2 3 2 1 3 4 3 2 1	W
149	S/S	C, Xs	PH	1 –7 –6 2 1 4 3 2 1	W
150	Che	C	IO	1 –7 –6 –5 –4 –3 –2 –5 –6 –5 –3 –7 1 –6 3 2 1	C, 2L, O
151	D/L	C, Xs	AO	1 –7 –6 –5 –3 –4 –5 1 3 2 1	J, L, M, Q
152	Alb	Xs	IO	1 –6 2 –7 1 –3 –4 –5 –6 –7 1 3 2 1	I, N, O, Q
	Sch	C, Xs		Albrechtsberger cited	
153	Jep	C, X	MX	1 –6 –7 1 2 1 4 3 2 1	
	R/F	X		No source cited	

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus																			Exceptions
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
154	S/S	C	MX	1	–6	–7	–6	–5	5	4	1	3*	2	1	"flat given as "optional"										
155a	Fux	Xs	PH	1	–6	–7	–6	–4	4	3	1	2	1												
	Jep	C, Xs		Fux cited in one of three places																					
	R/F	C, Xs		No source cited																					
	S/S	C		Fux cited																					
155b	Che	C	AO	No source cited																					
156a	R/F	X	PH	1	–6	–5	1	2	3	–7	1	–6	2	1											I, L, Z
156b	R/F	X	LY																						
157	D/L	C, Xs	IO	1	–8	–5	1	2	3	–7	–6	2	1												2L, Z
158	R/F	C	MX	1	–6	–5	–6	–7	–6	2	b3	2	1												L, R
159	R/F	C	IO	1	–6	–5	–6	–b7	–6	2	4	3	2	1											L, M
160	Che	C	IO	1	–6	–4	–5	2	–7	–5	–6	–7	1	–6	–7	1	2	3	2	1					C, I, 2M, N, P, V
161	Che	C	IO	1	–6	–4	–5	–6	2	–5	1	–4	–5	–6	–5	1	3	2	1						I, L, 2M, N, V, W
162	S/S	C	AO	1	–5	–7	–6	–5	3	2	1														
163	Jep	C, Xs	IO	1	–5	–6	–7	1	2	3	2	1													I, J, O
	R/F	X		No source cited																					
164	S/S	X	IO	1	–5	–6	–7	1	2	3	4	3	2	1											I, J, O, R
165	S/S	C, X	DR	1	–5	–6	–7	1	2	–7	3	2	1												
166	R/F	C	DR	1	–5	–b6	–5	5	4	2	3	2	1												
	S/S	Xs		No source cited																					
167	S/S	C	DR	1	–5	–b6	–5	–4	4	2	3	2	1												
168	R/F	X	LY	1	–5	–6	–5	–3	3	2	–7	1	2	1											
169	Che	C	AO	1	–5	–3	–4	–5	1	2	1	4	3	2	4	3	2	1							H, I, 2L, M, Q, R, V
170	Jep	C, Xs	PH	1	–4	4	3	2	1	–7	2	1													
	R/F	X		No source cited																					
171	Jep	C	PH	1	–4	–5	–6	–7	1	2	–7	3	2	1											O
	R/F	Xs		No source cited																					
172	Jep	C, X	MX	1	–4	–5	–6	–7	–6	2	1														Z
173	R/F	X	PH	1	–4	–5	–6	–5	1	3	2	1													L, M
174	R/F	C	MX	5	3	4	1	2	4	6	5	3	2	1											I, M, X

TABLE 1. continued

Entry Number	Author	Use	Mode	Cantus																			Exceptions
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
175	R/F	X	LY	5	3	4	5	8	6	5	3	2	1												J, Q, X
176	R/F	X	LY	5	3	4	5	8	6	7	3	2	1												L, Q, R, X
177	R/F	C	IO	5	6	5	3	5	4	3	4	2	1												X
178	R/F	X	AO	5	6	5	4	3	2	5	3	2	1												X
179	Jep	X	DR	8	1	2	4	3	2	1															C, J, X
180	R/F	X	PH	8	4	6	5	4	5	3	6	4	3	2	1										I, N, X
181	R/F	X	LY	8	5	4	3	6	3	2	1	b4	2	1											2L, X
182	Che	C	IO	8	6	4	5	3	6	2	5	1	3	2	4	5	4	3	2	1					C, I, M, N, W, X
183	Che	C	AO	8	6	4	7	5	3	6	4	2	5	3	2	1									I, 3M, N, R, W, X
184	R/F	X	DR	8	7	4	5	8	7	b6	5	3	2	1											H, J, Q, X
185	Che	C	AO	8	#7	5	8	6	4	5	3	4	2	3	4	3	2	1							H, I, M, N, W, X
186	R/F	X	DR	8	7	5	8	6	5	3	4	3	2	1											H, N, X
187	Che	C	IO	8	7	6	5	6	5	4	3	4	2	5	4	3	2	1							V, W, X
188	R/F	X	IO	8	7	8	6	5	3	4	3	2	1												H, X
189a	R/F	X	LY	8	7	8	6	5	3	4	5	3	2	1											H, X
189b	D/L	C, Xs	IO	No source cited																					
190	Che	C	AO	8	9	10	7	8	#6	#7	8	7	6	5	4	3	2	1							O, X
191	R/F	C	LY	–5	1	2	3	b4	3	2	1														I, J, L, Q, R, X

("b" = flat)

TABLE 2.

Principles Governing the Writing of Cantus Firmi, from Salzer and Schachter (1969)

Note:	The identifying letter labels for the successive principles are provided by the present author. The page reference following each principle is to the Salzer and Schachter book. For each principle the total amount of cantus firmi containing an exception to it is given; when there are nine or fewer tunes with an exception, the specific catalog entry numbers from Table 1 appear, preceded by a # sign. Further details about the principles are in the commentary.
PRINCIPLES	
A.	*... the cantus firmus must consist of tones of equal value* (p. 3). No exceptions.
B.	*It is best ... to write the cantus in whole notes (p. 3).* No exceptions.
C.	*The length can vary; as a rule the cantus will not contain fewer than eight or more that sixteen tones* (p. 4). Two have fewer than eight: #120, 179; 13 have more than sixteen.
D.	*... the cantus firmus should not contain intervals larger than an octave* (p. 4). No exceptions.
E.	*... the cantus firmus should not contain ... dissonant leaps. The dissonant leaps include all sevenths and all augmented and diminished disjunct intervals; we include the augmented second* ... (p. 4). No exceptions.
F.	*... the cantus firmus should not contain ... chromatic half steps* (p. 4). No exceptions.
G.	*A tenth between the lowest and the highest tone is the maximum range* (p. 4). No exceptions.
H.	*Each cantus firmus must contain a climax or high point. The climax tone should not be repeated* (p. 5). Clarification: the meaning is that the climax tone should not occur more than once in a cantus firmus (principle T advises against the immediate repetition of a tone). 21 exceptions.
I.	*... the cantus firmus will contain predominantly stepwise motion. Each cantus firmus will contain two to four leaps* (pp. 5-6). Six have only one leap: #7, 25, 76, 163, 164, 191; 52 have five or more.
J.	*The direction of the line will change several times in the course of the exercise* (p. 6). Clarification: "several" is not defined; the present author employs an arbitrary minimum of three changes of direction. 13 exceptions: six with only one change; seven with two changes of direction.
K.	*As a rule, a cantus will not contain more than two leaps larger than a fourth* (p. 6). Only one exception: #42.
L.	*Leaps larger than a third should be followed by a change of direction preferably in stepwise motion* (p. 7). Clarification: appearances of the letter "L" in the **Exceptions** column in the catalog (Table 1) identify cases that violate only the admonition to change direction after a leap larger than a third, and there are 57 of them, from 46 cantus firmi. Although not included in the catalog or in the general totals of exceptions, there are 90 cases from 72 cantus firmi where, even though the direction of the line does change, the motion is by leap rather than step.
M.	*Avoid two consecutive leaps in the same direction* (p. 7). 54 exceptions, from 47 cantus firmi. One cantus, #183, has three incidences; five have two: #12, 14, 92, 160, 161.
N.	*Avoid more than two consecutive leaps* (p. 7). 41 exceptions from 38 cantus firmi.
O.	*The student should take care not to continue a stepwise motion too long in the same direction. The vagueness of the preceding statement is intentional; a long cantus firmus can better assimilate an extended scalewise progression than a short cantus; it is therefore not possible to establish a universally valid limitation. In most cases, five tones seems to be the limit* (p. 7). To this limitation there are 21 exceptions from 20 cantus firmi.
P.	*In general, a leap of a fifth or larger should change direction* (p. 7). Clarification: that is, change direction from the immediately *preceding* motion, since principle L deals with motion *following* a leap. Eight exceptions: #12, 30, 34, 69, 95, 102, 110, 160.

TABLE 2. continued

Q.	*Avoid excessive motion in one direction, whether caused by stepwise progression alone, stepwise progression followed by a large leap, or stepwise progression interlaced with several small leaps* (p. 7). Clarification: "excessive" is not defined. The present author employs the following: "Avoid a succession of step(s) and leap(s) in the same direction if the compass exceeds a sixth." To this there are 25 exceptions, from 23 cantus firmi.
R.	*[Avoid] dissonant intervals ... formed by the first and last tones of a motion in a single direction* (p. 7). A footnote on page 8 adds: "The larger the number of intervening tones, the less the impression of outlining a dissonant interval arises." To the principle as stated, however, there are 27 exceptions from 26 cantus firmi, with the number of notes in the motions ranging from three to seven.
S.	*[Avoid a line that] reaches its climax on the leading tone* (p. 8). No exceptions.
T.	*The requirements of the cantus firmus exclude the immediate repetition of a tone* (p. 8). Two exceptions: #110, 124.
U.	*No single tone should sound so often that it dominates the entire exercise* (p. 3). Clarification: "sound so often" is not defined. In consideration of both the length of a cantus and the use of degree 1 as opposed to other degrees, the present author employs the following: "Avoid more than *four* occurrences of 1 if the cantus has up to thirteen tones; avoid more than *five* if the cantus has fourteen or more tones. Avoid more than *three* occurrences of any scale degree other than 1 if the cantus has up to thirteen tones; avoid more than *four* if the cantus has fourteen to seventeen tones; avoid more than *five* if the cantus has eighteen or more tones." There is one exception to the limitation on degree 1: #12. There are eight exceptions to the limit on other degrees: #17, 20, 46, 71, 74, 80, 82, 86.
V.	*[Avoid] the repetition of a distinctive group of tones* (p. 8). Clarification: "distinctive group" is not defined. The present author employs the following: "Avoid the recurrence of any (ordered) set of three or more (successive) tones during a cantus, unless the second occurrence is the concluding three- or four-tone segment of the cantus. 21 exceptions.
W.	... *avoid the use of so-called sequences* (p. 9). Clarification: "sequence" is not defined or delimited. The alternate employed by the present author is: Avoid any more than two occurrences of a *pattern* of two or more tones at a consistently higher or lower pitch level, even if only the first note of the third occurrence of the pattern appears. 26 exceptions from 25 cantus firmi.
X.	*If the cantus firmus is to form a self-contained whole ... it must begin and end on the tonic* (p. 9). Clarification: no indication is given concerning the octave register of the respective tonics; since all the cantus firmi in the Salzer and Schachter book do begin and end on the same note, cantus firmi in which there is an octave register difference between the first and the last tones also are considered exceptions in addition to those that begin on a scale degree other than 1. 20 exceptions; six do not begin on 1, and 14 have a difference in octave register.
Y.	a. ... *the approach to the final tone must be by step.* b. ... *it is usually best to approach the final tonic from above.* c. *[If approached from below] the final note must be approached by a half step* (p. 9). One exception (to all three parts): #146.
Z.	*The next-to-last tone will generally enter by step. It must never follow a leap larger than a third* (p. 9). Seven exceptions: #57, 88, 97, 146, 156, 157, 172.

COMMENTARY ON TABLE 2

The principles governing cantus firmi appear in Salzer and Schachter as directives to the student for composing cantus firmi. Thus, being a list of "do's" and "do not's," they reflect an *a priori* philosophical approach, and are not presented as an *a posteriori* compilation resulting from a study of a particular collection of cantus firmi. Of course references to characteristics of apparently existing cantus firmi do occur in some of the principles; also some either are or contain suggested preferences rather than being absolute directives.

Nevertheless, taken together, they provide an attempt to present a logical, complete summary of the abstract melodic elements associated with cantus firmi for species counterpoint and therefore were chosen to serve as the basis of comparison to an actual collection of cantus firmi. It is thereby possible to reflect on the cantus firmi in the light of the principles and to examine the principles in the light of the cantus firmi. Benefits accrue from both endeavors. On the one hand, insight may be gained regarding musico-melodic practice in the eight rather widely divergent sources; on the other hand, the extent to which the cantus firmi corroborate the stated principles concerning the preferred and the better-avoided elements is observable—and thus a better focus on the pedagogically oriented presentation and employment of such principles can be achieved.

The following comments seek to illuminate both issues through points of clarification and amplification regarding each principle in turn (as identified by its respective capital-letter label). In addition, cases are noted each time a Salzer/Schachter principle can also be found in either Schenker (1910) or Bellermann (1901)—Schenker, because of his obvious influence on Salzer and Schachter and Bellermann because Schenker makes several references to his work and, in fact (on Page 28 of Kontrapunkt), says that "Bellermann is the only contrapuntal theorist who discusses the cantus firmus."

A and B. All the cantus firmi in the catalog appear in (equal) whole notes in their respective sources, therefore the first two principles have no exceptions. Two sources, however, contain subsequent modifications to original whole-note tunes. In the Albrechtsberger (1955), in addition to the whole-note cantus firmi for the initial two-voice examples, some examples occur in which the original whole-note values are changed to dotted noted values (wholes or halves) for triple time settings, and examples of eight-against-one counterpoint employ both half-note and even quarter-note cantus firmus values (starting with two-voice counterpoint). Also, in the latter, the values of the two final cantus notes sometimes change (by being

lengthened). Further, in four-voice texture examples, cantus firmi for first, second, third, and fourth species are in half notes (those for fifth species return to whole notes). Jeppesen also contains a few examples where original whole-note cantus firmi appear later as dotted whole notes in 3/2 meter. The foregoing amplification notwithstanding, however, principles A and B certainly reflect the prevailing attitude regarding the values of notes in a cantus. Both Bellermann and Schenker suggest (equal) whole notes as well.

C. The Salzer/Schachter statement of principle C regarding the number of tones in a cantus contains the phrase "as a rule," which perhaps has an *a posteriori* implication, but in the text no justification is given regarding the choice of either the suggested minimum (8) or maximum (16). The statement occurs on page 4 of the text; curiously, however, page 17 says "The student will remember that most cantus firmi contain from nine to twelve tones." Since the statement on page 4 occurs among many other principles, it was selected for this study. (However, even though "most cantus firmi" is not defined, this study corroborates the general implication of the page 17 statement since 137 of the cantus firmi have from nine to twelve tones while the remaining 54 include 11 with seven or eight tones and 43 with more than twelve.)

The two exceptions to the minimum number of tones (8) are both 7-tone cantus firmi by Jeppesen (#120, 179). Equally interesting is that all 13 examples containing more than sixteen tones are by Cherubini. 27 cantus firmi have nine tones, 41 have ten, 53 have 11; the average length is 11.4 tones. Regarding the number of tones in a cantus, Bellermann suggests approximately 9, 10, 11, 12, 13, or at the most 14 or 15, and Schenker says that the cantus was never extended beyond fifteen or sixteen measures [notes]. The exceptions notwithstanding, the number initially suggested by Salzer and Schachter (8-16) certainly seems appropriate and the even more restricted limit of 9-12 might be considered as well, especially for pedagogical applications.

D. E. F. G. No exceptions to these four occur in the catalogued tunes. The proscription of leaps larger than an octave (D), dissonant leaps (E), and range larger than a tenth (G) reflects the influence, with concomitant limitations, of basic vocal tradition. These three principles also are stated by both Bellermann and Schenker. While the concern of principles D and E is with leaps, nothing is mentioned regarding the leap of a sixth, even though strict vocal compositional practice from chant through Palestrina does exclude major sixths as well as descending minor sixths. Actually, the inclusion of such a principle in Salzer and Schachter would have been

supported by the catalogued cantus firmi since no major-sixth leaps are found and two ascending minor sixths (in #135 and 162) do appear. A descending minor sixth (that would be the only exception) occurs from 1 to -3 in an Ionian tune by Albrechtsberger (#152). Bellermann categorizes major sixths and the descending minor sixth as "forbidden." Schenker accepts all sixths. Additionally, there are nineteen octave leaps—fourteen ascending and five descending. Salzer and Schachter do not comment on octave leaps by direction. Bellermann "forbids" the descending octave while Schenker says that the ascending octave is preferred over the descending.[1]

The advice to avoid chromatic half steps (principle F), also found in both Bellermann and Schenker, reflects a preference grounded on both stylistic and philosophical dictates. One interesting digression from principle F, however, is found in the section labeled "free style" (thus not included in the present catalog) in the work by Albrechtsberger (1855) where a tune labeled "chorale" consists of the successive tones A G# G F# F E E F F# G G# A C B A.

I. Because 58 of the 191 cantus firmi (30%) do not conform to the Salzer/Schachter statement that "each cantus firmus will contain two or four leaps," the statement may seem too strong and a bit too delimiting (especially without an accompanying reference to the number of tones in a cantus.) Only six cantus firmi contain just one leap, so it is appropriate to suggest two leaps as the minimum. However, 30 of the 52 with more than four leaps have five leaps; therefore one suggestion is to consider five as an appropriate maximum and modify the statement to read "most cantus firmi contain from two to five leaps." Even Salzer and Schachter include two examples that contain an exception to their principle: catalog #66 (an eleven-tone tune found on their pages 24, 70, 77 and attributed to Roth) contains five leaps, and tune #164 (found on page 99 of their book, with no attribution) contains only one leap. Also, this is the only principle for which all authors have at least one cantus firmus with an exception: Albrechtsberger has 3, Cherubini 24, Davis and Lybbert 3, Fux 2, Jeppesen 3, Roberts and Fischer 20, and Schenker 1 (#96). A count of exceptions to principle 1 in relation to the number of tones per cantus substantiates the expectation that the longer cantus firmi (those with 13 or more tones) are likelier to have more than four leaps.

Thus the other plausible modification to statement I (instead of changing the number of leaps from four to five) would be to leave the numbers two to four as is and add "as long as the cantus does not contain more than 12 tones." Then a provision would have to be added for cantus firmi with 13 or more tones. Such a procedure was found necessary as clarification for

principle U for instance but here, for principle I, the exact delimitation becomes a matter of personal preference; the evidence in the cantus firmi may influence the reader's judgment. The first suggestion (from two to five leaps) is straightforward, clear, and my personal favored recommendation.

J. Principle J (the direction of the line will change several times in the course of the exercise) seems intuitively logical. It forces each teacher and student, however, to define or delimit "several." Obviously, regarding exceptions to principles for this study, I have had to delimit in those cases where Salzer and Schachter are less than specific. (Besides principle J, this is also necessary for principles Q, U, V, W, and X.) For J, three changes of direction was chosen as the minimum number since only thirteen cantus firmi have fewer than three and also since 53 do have three.

The 13 exceptions come from four sources. Those with just one change of direction include two by Davis and Lybbert (#25, 27); one by Jeppesen (#76); and three by Roberts and Fischer (#41, 84, 191). Those with only two changes of direction include one by Davis and Lybbert (#151); two by Jeppesen (#163,179); three by Roberts and Fischer (#147, 175, 184); and one by Salzer and Schachter (#164).

Study of the relation between the number of tones in a cantus and the number of direction changes supports another seemingly logical assumption: namely, the greater the length, the greater the number of direction changes. The number of direction changes varies from one to thirteen; those with the most occurrences are 54 tunes with five direction changes and 53 tunes with three changes. This leads to another interesting observation: there are far more cantus firmi with an odd number of changes of direction (143) than with an even number of changes (48). This odd-even factor (not mentioned in Salzer and Schachter) is dependent upon the relation between: 1) the initial motion of melody (that is, from the first to the second tone) and 2) the concluding motion of a melody (that is, from the penultimate to the ultimate tone). If the direction of these two motions is the same (both ascending or both descending), the number of changes will be even; if the direction is opposite, the number of changes will be odd. The latter is the case in the majority of the cantus firmi since so many begin with an ascent from the first degree and end with a descent from the second to the first degree. This is true of the first 139 cantus firmi with only one exception: #32 ends with the ascent from 7 to 8 (after starting with the ascent from 1 to 2) and therefore has an even number (6) of direction changes. Consequently, while the average number of changes is 4.76, a fair generality would be that "the majority of cantus firmi has either 3 or 5 changes of direction" (107 out of 191) which results both from the relationship between the initial and concluding motions and from the average overall length of the cantus firmi.

Besides the suggestion of a minimum number of changes, there is no allusion in principle J to a maximum number (upon which the length of the cantus would have some bearing). The principle, however, with the more specifically delimiting clarification of a minimum of three changes, is well supported by the catalogued cantus firmi.

K. Avoiding more than two leaps larger than a fourth is an obviously important characteristic contributing to the overall concept of conjunct melodic motion. Considering both the number of cantus firmi catalogued and the length of some of them, however, it does seem noteworthy that of all 191 only one cantus has more than two such leaps. (In #42, a 15-tone cantus by Albrechtsberger, there is an ascending octave and two descending perfect fifths.) Consequently, principle K is justified.

L. Principle L is concerned with two aspects of motion following a leap larger than a third. The first is that the direction of the line should change. It does so in 246 instances. There are, however, 57 exceptions (from 46 cantus firmi) where motion continues in the same direction. In the catalog the letter L is used only to indicate exceptions to the phrase "the direction of the line should change." The second part of principle L is "preferably in stepwise motion." Since it is stated as a preference, exceptions are not noted in the catalog, but of the 246 instances of direction change, there are 90 cases, from 72 cantus firmi, where the change is by leap rather than step. Of these leaps, 68 are thirds, 12 are fourths, 6 are fifths, and 4 are octaves.

The advice in principle L, like that for principle K, is also commonly associated with ideal melodic motion. The number of exceptions to the admonition to change direction after a leap larger than a third (57, from 46 cantus firmi) as well as to the preference to do so by stepwise motion (90, from 72 cantus firmi), is more than I expected to find, however, and suggests that it indeed was advisable to use "should" and "preferably" in the statement of the principle rather than anything more stringent (as in principle K, for instance).

The 57 instances counted as exceptions to the principle are divided among Cherubini with 19 exceptions, from 12 cantus firmi, including two that have three each (#44 and 111), Davis and Lybbert with five exceptions from four cantus firmi, Fux with one (in #92), Jeppesen with one (in #132), Roberts and Fischer with 29 exceptions, from 27 cantus firmi, and Schenker with two exceptions in one cantus (#49). Albrechtsberger along with Salzer and Schachter have no tunes with exceptions. Although there are exceptions to principle L in tunes by Schenker, he mentions that the requirements of a flowing melody include the change of direction by step after a leap. Bellermann's advice is to follow a large ascending interval with a small

descending interval. Even though not included in the catalog or in the summarizing tallies for this study, the 90 exceptions to the second part of the principle (the preference for the direction change to be by step) are divided among all eight sources.

Given the number of exceptions in the catalogued cantus firmi to both parts of principle L, some may feel that a reconsideration of the principle is in order. An alternate proposal presents a challenge, however, because of the varying combinations of direction and size of a motion following a leap. Nevertheless, based on the exceptions to both parts of the principle, it is possible to suggest that the two most common occurrences (37 instances of an ascending fourth followed by an ascending second and 41 instances of an ascending fourth followed by a descending third) be considered "acceptable exceptions," thereby reducing the exceptions to a direction change from 57 to 20 and the stepwise motion from 90 to 49. Thus the modified principle would read: "With the exception of an ascending fourth followed by an ascending second or by a descending third, leaps larger than a third should be followed by a change in direction, preferably in stepwise motion." This modification would more closely reflect the catalogue practice, but the decision to modify must still be made on philosophical preference. Even with the exceptions, many may wish to use principle L as is, but the evidence in the catalogued cantus firmi at least necessitates more careful consideration than might have been assumed.

M. Avoidance of two consecutive leaps in the same direction eliminates (triadic) arpeggiation in a cantus. The Salzer/Schachter text does not discuss this when the principle is presented on pages 6 and 7. Page 6 says "skips of a third may be continued in the same direction" but implies that the continuation should be by stepwise motion. Only later, in second species counterpoint lines (p.44), is the possibility presented of subdividing larger (consonant) intervals into two smaller leaps. All of the cantus firmi in Salzer/Schachter avoid arpeggiated triads, so their cantus firmi adhere to the principle as stated. It is interesting that of the eight sources used for this study, Jeppesen is the only other one that also avoids triadic arpeggiation. Arpeggiation examples in the catalogued cantus firmi include one by Albrechtsberger (#42); one by Schenker (#96); two by Davis and Lybbert (#122, 151); four, from two cantus firmi, by Fux (#12, 92); 20 examples, from 16 cantus firmi, by Cherubini; and 26, from 25 cantus firmi, by Roberts and Fischer—54 instances from 47 cantus firmi.

Most of these arpeggiated triads are major or minor, but four are arpeggiated diminished triads in 5/3 position (all descending). Not surprisingly, there are no arpeggiated augmented triads. At least one or two examples are found of the three "positions" of major and minor triads, both

ascending and descending, except for no descending minor triads in 6/3 position. The two most common arpeggiations are the descending major and minor triads in 5/3 position, with 15 and 12 occurrences, respectively. The arpeggiations are not restricted by scalar placement or by mode. In fact, examples of descending 5/3 positions beginning on all seven of the respective scale degrees are found, with those starting on 8 or 1 (nine examples) being the most common.

Bellermann's comments about principle M include the admonition to avoid two successive fifths or fourths in the same direction, avoid several leaps in the same direction, and avoid two leaps in the same direction that equal a seventh, ninth, or tenth, with downward direction being even worse than upward. Nevertheless, these do not exclude the arpeggiation of a triad. Schenker, however, does make this exclusion as he says to avoid successions of pitches that would stand out as arpeggiation or figuration of a chord, and subsequently adds that successive leaps in the same direction are prohibited because they could lead beyond the limit of the range and could establish triads or seventh chords. (Schenker's cantus with an exception - catalog #96 - contains the succession 8 6 3.)

Since there are 54 exceptions to principle M in the catalogue, it may seem appropriate to admit the occasional use of triadic arpeggiation. On the other hand, a more abstract musico-philosophic attitude regarding the relationship between arpeggiation and desirable melodic motion in a cantus could lead one pedagogically to avoid arpeggiation when students are writing cantus firmi or when cantus firmi are being selected for species exercises. At any rate the modification seems worthy of careful consideration, personal preferences notwithstanding, and could accept the two most common occurrences; thus to the principle would be added the phrase "with the exception of descending major or minor triads in 5/3 position," which would reduce the exceptions from 54 to 26.

N. Even though it seems intuitively appropriate to exclude more than two successive leaps in a cantus there are, as with principle M, many exceptions to principle N (41, from 38 cantus firmi). All authors except Salzer and Schachter, in fact, have one or more cantus firmi with exceptions: Albrechtsberger has two (#42, 152), Cherubini 14, Davis and Lybbert one (#116), Fux two (#12, 92), Jeppesen two (#120, 123), Roberts and Fischer 16, and Schenker one (#96). Tunes by Albrechtsberger (#42), Cherubini (#59), and Fux (#92) each have two different places that exceed the limitation; thus two exceptions are counted for each. Besides 25 of the 41 exceptions that have three successive leaps, however, there are 12 cases of four successive leaps, two of five (#20, by Roberts and Fischer and #89, by Cherubini), one of six (#182, by Cherubini), and the granddaddy is #183, a 13-tone cantus by

Cherubini that has 10 successive leaps (though all of these cases are counted as just one exception each). Schenker avoids two successive leaps, even with a change in direction. As with principle M, principle N can be adhered to (musically and pedagogically) as stated, despite the many exceptions. The alternative, based on the cantus firmi, would be to increase the maximum from two to three successive leaps, thereby reducing the exceptions from 41 to 16.

O. Principle O, which suggests a maximum of five scalar tones in the same direction, is the only one addressed directly to "the student." The authors also admit to an intentional vagueness by saying "not to continue a stepwise motion too long in the same direction," but they do end up suggesting five tones as the maximum, justified by the phrase, "in most cases [this] seems to be the limit." This justification implies an *a posteriori* observation without, however, any reference to a collection of cantus firmi. Also, even though the length of the cantus affects the acceptable number of successive scalar tones, no length is given for the five-tone limit.

With the five-tone limitation, 21 exceptions (from 20 cantus firmi) occur in the catalogued tunes. Seventeen of the 21 are 6-tone successions, so if the principle were modified, raising the maximum to six successive tones would result in only four exceptions—or three exceptions for 7 tones (#134, 150, 164) and one for 8 tones. The 7-tone successions occur in cantus firmi having 12, 17, and 11 tones respectively, and the 8-tone succession is a descent from 8 to 1 in a 15-tone cantus by Cherubini (#190). Another 15-tone cantus by Cherubini has two exceptions (#23). All sources in the study except Schenker do have at least one exception; #164 is the one case from Salzer and Schachter. There is one from Albrechtsberger (#152), one from Davis and Lybbert (#25), two from Fux (#52, 55), four from Cherubini, five from Jeppesen, and six from Roberts and Fischer. In comparison to the exceptions to the principle, the "non-exceptions" include 78 examples of 4-tone scalar successions (19 ascending and 59 descending) and 31 examples of 5-tone scalar successions (10 ascending and 21 descending).

P. The point made in principle P (regarding having a leap of a fifth or larger go in the direction opposite to that immediately preceding) is well taken as there are only eight exceptions in the cantus firmi. In five cases a descending fifth follows a descending step, and in three cases an ascending fifth follows an ascending step. One of the exceptions occurs in a cantus by Salzer and Schachter (#30), one in a cantus by Fux (#12), one by Schenker (#34), two by Cherubini (#110, 160) and three by Roberts and Fischer (#69, 95, 102). There are no exceptions in the cantus firmi by Albrechtsberger, Davis and Lybbert, or Jeppesen. Of the exceptions, three have the degree

succession 6 5 1; the other five are all different. The clarification provided for principle P (change direction from the immediately *preceding* motion) was only to avoid any misunderstanding about the context of the leap; actually it might have been better to place principle P just before principle L to deal successively with motion into a leap and then motion from a leap. Other than this, the principle is appropriate, as corroborated by the cantus firmi.

Q. This Salzer/Schachter principle (avoid excessive motion in one direction, by stepwise progression alone, stepwise progression followed by a large leap, or stepwise progression interlaced with several smaller leaps) makes it necessary to clarify "excessive motion." Since "stepwise progression alone" is the subject of principle O, it seems unnecessary to include it in principle Q (thus such cases are not counted as exceptions here) and since "stepwise progression followed by a large leap" is essentially covered by principle P, the focus of principle Q was directed to the last part of the statement that refers to "stepwise progression interlaced with several smaller leaps." Because there are 25 exceptions when the maximum compass is set at a sixth for a unidirectional succession of any combination of step(s) and leap(s) (implying either one or more of both) and that these exceptions are limited to compasses of either sevenths or octaves, the sixth was chosen as the maximum compass. Thus the clarified alternative states, "avoid a succession of step(s) and leap(s) in the same direction if the compass exceeds a sixth."

The 25 exceptions come from 23 cantus firmi: one by Albrechtsberger (#152), five by Cherubini, one by Davis and Lybbert (#151), one by Fux (#12), 16 examples from 14 cantus firmi by Roberts and Fischer, and one by Schenker (#49). There are no exceptions in the cantus firmi by Jeppesen or by Salzer and Schachter. Of the exceptions, 16 have a compass of a seventh (eight ascending and eight descending patterns) and nine have a compass of an octave (five ascending and four descending).

Questions regarding the pedagogical application of principle Q thus concern: 1) the degree of precision desired (accept the principle as is or use the more specific clarification as suggested?) and 2) the choice of interval for the maximum compass if the clarification is employed (accept the sixth as suggested, or prefer other?).

R. Exceptions to principle R (avoid dissonant intervals formed by the first and last tones of a motion in a single direction) are limited to only three dissonant intervals: the diminished fifth (nine cases), the minor seventh (16 cases), and the major seventh (two cases). Six cases have a three-note succession; ten have four notes; five have five notes; four have six notes; and

two have seven notes. The direction is divided between 14 ascending and 13 descending motions. Even though a footnote in Salzer and Schachter suggests an inverse relation between the effect of the two tones in dissonant relationship and the number of tones between them, no further specific limit was set and the exceptions just mentioned include all cases. Obviously, exceptions to principle O (limit of five tones in stepwise motion) and to principle Q (maximum compass of sixth for unidirectional combination of steps and leaps) that have a compass of a seventh also will be exceptions to principle R.

For principle R, two sources have no exceptions: Albrechtsberger, and Davis and Lybbert. There is one exception each by Fux (#12), Jeppesen (#134), Salzer and Schachter (#164), and Schenker (#49). There are eight exceptions from Cherubini, and 15, from 14 cantus firmi, by Roberts and Fischer. Schenker says to avoid dissonant aggregates of notes, and Bellermann says to avoid the tritone as the first and last tones of a motion. Considering the relatively limited number of exceptions, principle R seems appropriate for pedagogy.

S. The leading tone is never the climax note so principle S, which advises against this occurrence, is most appropriate advice. There are, however, seven cantus firmi that climax on the subtonic note: an Aeolian tune by Schenker (#49), an Aeolian tune by Cherubini (#114), and five tunes by Roberts and Fischer, including one Mixolydian (#78), three Dorian (#79, 129, 147), and one Phrygian (#103). This small number suggests that the subtonic should be prohibited as a climax note as well.

T. The immediate repetition of a tone is avoided in all but two of the catalogued cantus firmi. One exception is a repeated fifth degree near the end of an 18-tone Ionian cantus by Cherubini (#110) and the other is a repeated subtonic (below the final) in an 11-tone Dorian cantus by Roberts and Fischer. Both Bellermann and Schenker advise against such repetition, and Schenker argues that it is a phenomenon of free composition. Salzer and Schachter justify the exclusion of immediate repetition of a tone because it interferes with the necessary rhythmic equality and because the creation of a static pitch point sets the line as a whole out of balance. Since only two tunes have an exception, the point is appropriately well taken.

U. Obviously it is difficult to provide a specific delimitation for principle U (no single tone should sound so often that it dominates the entire exercise) but again, for this study, it was necessary to assign a numerical limit. As mentioned in the clarification of principle U given in the list of principles, it seems appropriate to differentiate in limit between scale

degree 1 and all other scale degrees, since 1 usually both starts and ends a cantus; it also seems appropriate to differentiate by the length of a cantus. Therefore the clarification for principle U was made, even though it is cumbersome. The limit is based on a "common-sense" feeling for the number of occurrences of any one scale degree, and the small number of exceptions suggests that it may be an appropriate approach (the example in Salzer and Schachter for the overuse of a single tone would violate the suggested limitation).

Even the chosen limitation, however, does not take into account the nature of the linear motion at the scale degree in question (is it part of a continuing stepwise motion, or approached or left by leap, or a "turn-around" point, or do these differences make a difference?) nor does it attempt to allow for any relative impact among the various scale degrees (are four occurrences of degree 3 in a 12-note cantus—such as in catalog #73—apt to sound as if they "dominate the exercise" any more or less than four occurrences of degree 2 in a 12-note cantus—such as in catalog #20—for instance?). Consequently this is another example where the principle can be readily accepted, but the application of the principle to a more specific pedagogical environment might provoke differing opinions. The very consideration of this issue, however, in a counterpoint class for instance, may itself yield pedagogical benefits that otherwise could be missed (thereby serving the present article as well.)

The reader is left to decide whether the chosen limits are arbitrary or whether subjective evaluation may be required to judge the appropriate number of scale-degree occurrences. Certainly the general concept is relevant and should be included among the principles.

V. This principle, which advises against the "repetition of a distinctive group of tones," also needs a clarifying limitation such as "avoid the recurrence of any (ordered) set of three or more (successive) tones during a cantus, unless the second occurrence is the concluding three- or four-tone segment of the cantus." As with principle U, a "common sense" feeling was employed in arriving at the limitation, along with a supporting implication from the cantus in Salzer and Schachter that violates their principle by a recurring three-note set. For the clarification, only the number of tones in a recurring set (three or more) is the limitation, and no further attempt was made to delimit "distinctive group of tones" by melodic shape (is a scalar set such as 4 3 2 just as distinctive as a set with a leap or with a change of direction?), or by length of cantus, or by distance between statements of the reiterated set. Since so many of the catalogued cantus firmi have "stock" three-note endings, an earlier appearance in a cantus of such a closing formula should not be as suspect as other recurrences—therefore, the

exclusion of the closing formula. This still did lead, however, to counting as exceptions five cantus firmi that have 4 3 2 1 as concluding tones when earlier the three-note succession 4 3 2 does not then go to 1.

Of the 21 exceptions to principle V as clarified, 14 have stepwise sets and seven have sets that include a leap. Of the 14 stepwise sets, seven are the three-note succession 4 3 2. The exceptions are from four sources: 11 from Cherubini (#17, 40, 46, 86, 96, 106, 107, 143, 160, 161, 169, 187), one from Davis and Lybbert (#116), seven from Roberts and Fischer (#2, 11, 19, 68, 69, 71, 133), and two from Schenker (#49, 96, each of which has a reiterated 4 3 2 set). In both Bellermann and Schenker there is a comment that may relate to this principle but that also is less than specifically delimited: Bellermann says to avoid grouping of 2, 3, or 4 notes that form larger units by placement and accentuation and Schenker's advises to prevent groups of several tones from establishing units based on rhythm or harmony. Based on the cantus firmi with exceptions, the clarifying limitation adopted for this principle again is warranted. Nevertheless students can justifiably be made aware of the basic premise of the principle.

W. For this principle (avoid sequences), it was necessary to precisely define a sequence. The negative example in Salzer and Schachter (example 1 - 14 on their page 9) contains two three-note patterns, each used at two pitch levels. Nothing is specified, however, about the minimum number of notes in a pattern or the minimum number of patterns. The restriction used for this study does not exclude two-note patterns. Counted as exceptions are more than two occurrences of patterns of two or more tones at a consistently highly or lower pitch level, even if only the first note of the third occurrence of the pattern appears.

There are 26 of these exceptions from 25 cantus firmi. Of the exceptions, 21 are a two-note pattern, only one is a three-note pattern (in #183, by Cherubini), and four are a four-note pattern (in #18, 111, 148, and 187). Exceptions come from five sources: Cherubini (15 exceptions, including #89 that has two exceptions and #148 with three statements of a four-note pattern), Davis and Lybbert (one exception, #53), Fux (one exception, #55), Roberts and Fischer (seven exceptions), and Salzer and Schachter (two exceptions, #108 and 149, both two-note patterns). Again, the point of the principle is well taken; yet while a black-and-white delimitation is a challenge, the number of exceptions is not great enough to make suspect the basic premise.

Obviously if a different number of notes or patterns for defining a sequence were used, the number of exceptions would change accordingly. For instance if only patterns with three or more notes were to be considered exceptions, there would be only five: one with three notes (#183) and four

with four notes (# 18, 111, 148, 187). On the other hand, if the minimum number of (complete) statements of a pattern were three (but included two or more notes per pattern) there would be only four exceptions: #55, 109, 148, 183.

X. The restriction of beginning and ending on the tonic is observed in the majority of the catalogued cantus firmi, and exceptions mainly concern the initial note. There are five tunes that start on 5 (#174-178, all from Roberts and Fischer) and one that starts on -5 (#191, also from Roberts and Fischer). As explained in the clarification to principle X in Table 2, an octave difference between the first and last tones is also considered an exception. Two start on 1 and end on 8 (#111, by Cherubini, and #118, by Roberts and Fischer). Twelve start on 8 and end on 1 (#179-190; #179 from Jeppesen, five from Cherubini, and six from Roberts and Fischer). Evidence thus supports the basic principle and the clarifying codicil as well; consequently it seems best to prohibit the octave register difference. Principle X is found in Schenker (but, as with Salzer and Schachter, with no specific dictum on octave register difference) and Bellermann advises to start on the Grundton of the mode.

Y. The three conditions regarding the approach to the final tone (by step; usually from above; if from below, by half step) were grouped together as one principle. The only exception—to all three parts—is cantus #146 , a nine-tone Phrygian tune by Jeppesen that ends with the three-note succession 1 -4 1.

Even though the principle allows for either the 2 1 or (raised) 7 8 conclusion, it might have been just as appropriate to eliminate any choice and simply declare that cantus firmi [are to] end with the succession 2 1, for besides the Jeppesen exception there is only one cantus that ends with 7 8 (#32, by Schenker) and two that end with 9 8, which may or may not be considered exceptions, but are if the octave register restriction is an acceptable addition to principle X. Consequently, since all the other 187 cantus firmi do end with 2 1, it seems that a preference for the exclusive use of 2 1 would be justified. The Salzer and Schachter statement however, agreeing with that by Schenker, does allow the approach to the final 1 to be by step from either above or below.

Z. The final principle concerns motion from the antepenultimate tone to the penultimate tone, with the motion being limited to only seconds or thirds. One exception is #146 (the Jeppesen tune that also is the exception to principle Y) whose conclusion is 1 -4 1. The other six exceptions are from cantus firmi that end with -6 2 1: one by Jeppesen (#172), four by Roberts

and Fischer (#157, 88, 97, 156), and one by Davis and Lybbert (#157). As with the concluding two notes, for principle Y, it is interesting to look at the concluding *three*-note succession of all the tunes in the catalog in relation to principle Z. The fact that the succession 3 2 1 concludes 151 of the 191 cantus firmi makes it a heavy favorite, far surpassing its closest rivals: 4 2 1, which occurs sixteen times, and 1 2 1, which occurs twelve times. The remaining incidences are -7 2 1 with two occurrences (#140, 170), and single occurrences of 1 -7 1 (#32), 8 9 8 (#111), and 10 9 8 (#118). Therefore, even though one may wish to retain an option, it would not be inappropriate to point out that a good majority of cantus firmi do end with 3 2 1 (here 79%) and it might be advisable to employ this restriction.

SUMMARY: CANTUS FIRMI AND THE PRINCIPLES

The preceding commentary emphasized that this study facilitates both a reflection on the cantus firmi in light of the principles and an evaluation of the principles in the light of the cantus firmi. Table 3 summarizes information concerning the cantus firmi. The authors are listed in alphabetical order; for each, the total number of cantus firmi, the number of that total with no exceptions, and the number of cantus firmi that have from one to eight exceptions appear. (Multiples of an exception to one principle in one cantus are counted; for instance, since catalog #14 has one exception to principle I and two to principle M, it was counted as having three exceptions.) The next-to-last column on Table 3 gives the total of all exceptions for each source, and the final column gives the average number of exceptions per cantus.

Note that of the 191 discrete tunes, only 45 have no exceptions and the others (146 = 76%) have from one to eight exceptions, with a combined total of 427 exceptions. In fact, a comparison of columns two (Total CF) and three (0 Exceptions) shows that the Salzer/Schachter text is the only one that has more tunes without than with exceptions.

The last column (average number of exceptions per cantus firmus) provides a basis for an interesting categorization. Four subdivisions are suggested. The first consists only of the tunes in the Salzer/Schachter text since they average less than one-half exception per cantus and thus highly exemplify the principles as stated in the text. (Nevertheless it is also true that five of the 20 cantus firmi in Salzer and Schachter do indeed exhibit exceptions to the authors' own principles, albeit four of the five have only one exception.) The second subdivision contains the tunes by Jeppesen, since his exceptions average to one per cantus. The third subdivision groups Davis and Lybbert, Fux, Roberts and Fischer, and Schenker, as

exceptions average from 2.0 to 2.3 per cantus. The fourth and final subdivision contains the tunes by Albrechtsberger, averaging 3.7, and Cherubini, averaging 4.7 exceptions per cantus.

TABLE 3.
Cantus Firmi, by Source, with Respective Totals of Exceptions

		Number of Exceptions										
	Total CF	0	1	2	3	4	5	6	7	8	Total Exceptions	Average Exceptions per CF
Alb	3	0		1		1	1				11	3.7
Cher	33	1	2	2	4	6	5	6	4	3	155	4.7
D/L	9	1	3	1	2	2					19	2.1
Fux	8	3	2	1				1		1	18	2.3
Jep	20	8	5	5	2						21	1.0
R/F	93	15	23	27	14	9	2	1	2		185	2.0
S/S	20	15	4			1					8	0.4
Sch	5	2	1			1	1				10	2.0
Totals	191	45	40	37	22	20	9	8	6	4	427	2.2

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Thus, the more typical cantus firmi, as judged by the principles, are found in the first three subdivisions (and among them, the tunes with no more than two exceptions, which reflects the overall combined average of 2.2 exceptions per cantus). Those by Albrechtsberger and Cherubini are not as likely to correspond to the more typical prototype in the total collection or in the codified principles. (Yet there is one—#29—by Cherubini with no exceptions, and a total of five from both authors with just one or two exceptions each.)

Of course any of the 45 tunes having no exceptions (see the catalog, Table 1) are useable as prototypical models (bearing in mind that some may have an exception to the second part of principle L, which is not included in the tally; thus leaps larger than a third being followed by a leap, rather than a step, in the opposite direction may be found). An even more select choice, however, can be made by including most common length (11 tones), most common range (a sixth), and most common climax tone (degree 6) as discussed in principles C, G, and H.

Six tunes meet these combined criteria: #33, by Schenker; #37 (which does have an exception to the not-tallied second part of principle L) and #38

by Salzer and Schachter; #51 by Jeppesen; #63, by Salzer and Schachter; and #98, by Roberts and Fischer. It is certainly a credit to Salzer and Schachter that they are represented by a disproportionate three of the six; note also that missing from the group are tunes from Albrechtsberger, Cherubini, Davis and Lybbert, and Fux. (If one admits 10-tone tunes, five more would qualify for this select category: #28, by Roberts and Fischer; #29, by Cherubini, #62, by Salzer and Schachter; #77, by Davis and Lybbert; and #130 by Salzer and Schachter.) Other factors could also influence a search for a tune, or tunes, but the catalog should prove helpful since both tunes and respective exceptions are displayed.

The previous comments have summarized the tunes in light of the principles. Of course the music came first, so the respective authors could not have composed tunes to adhere to someone else's concept of what to include or exclude in a cantus. But the corpus of tunes really suggests its own set of principles, and the respective creators undoubtedly understood that, by publishing, they were joining an on-going historical and pedagogical tradition that inevitably is scrutinized and compared. Their efforts thus continue to serve newer generations, as indeed they have in this study.

In addition to comparing the cantus firmi with the principles, two final items conclude this section on the tunes. The first is a summary of tunes appearing in two or more sources. As mentioned earlier, citations of such borrowings are noted in the catalog; otherwise, "No source cited" appears. For these latter, I assume that the various authors were aware of such borrowings, but it is possible that in a few cases the duplication is strictly coincidental, or that a tune's appearance is not cited because only the tune and not the accompanying counterpoint(s) were borrowed. For the sake of general interest, Table 4 summarizes the duplications. Each author is listed in the left column and respective borrowings follow on the right side (listed by catalog number; refer to the catalog for citations). Borrowings within the selected group of eight sources are enclosed by the boxes. Notice that with the exception of the earliest two (Fux and Albrechtsberger) all six of the remaining sources have at least one borrowed tune.

The final item concerns an intriguing pedagogical concept about species counterpoint—the "global rule" proposed by David Lewin.[2] He applies the rule specifically to the composed counterpoint line and not to the cantus firmus in species counterpoint, but the rule is mentioned here because it relates to the general topic and introduces an aspect of melodic construction not yet considered. Lewin proposes the avoidance of so-called "hanging" tones, which are any notes that do not conform to his global rule. The "first form" of the rule reads: "For every note X of the counterpoint line lying above (below) the cadence tone, some note lying one step lower (higher) than X must appear in the line at some point subsequent to X." Even

though he does not mention the presence or absence of hanging tones (or desirability thereof) in a cantus, of the three cantus firmi employed in his examples, two do not have any hanging tones, but one does. Out of curiosity I surveyed the catalogued cantus firmi for hanging tones. The results are that 74 do not have hanging tones while 117 do (some have more than one). Thus, avoidance of a hanging tone is not a characteristic of the majority of the catalogued cantus firmi. Some readers, however, may find it rewarding to consider this rule in melodic construction—in relation to cantus firmi or to counterpoints, or to a combination of both.

TABLE 4.
List of Borrowed Tunes

Text (Date of Orig. Ed.)	Tunes Borrowed From	Catalog #
Fux (1725)		
Albrechtsberger (1790)		
Cherubini (1835)	Fux	12, 35, 45, 55, 74, 92, 155
Schenker (1910)	Fux	12, 45, 55, 74
	Alb	42, 101, 152
	Che	59, 89
Jeppesen (1931)	Fux	45, 74, 155
Roberts and Fischer (1967)*	Fux	45, 52, 74, 155
	Che	29
	Jep	43, 76, 123, 125, 127, 132, 134, 135, 138, 140, 153, 163, 170, 171
Davis and Lybbert (1969)	R/F	189
Salzer and Schachter (1969)	Fux	12, 45, 74, 155
	Che	29
	Sch	21, 33
	Jep	125, 127
	R/F	166
	*Prout	81, 84, 141

To summarize, Table 5 displays the number of exceptions to each of the 26 principles, cross referenced to the respective sources. The letter labels (A-Z) of the principles are in successive columns, left-to-right. The sources appear in successive rows, in alphabetical order. For multiple exceptions to one principle in one cantus firmus, two numbers are given, divided by a virgule: the first is the total number of exceptions (including the multiples in one cantus), and the second is the number of cantus firmi with exceptions.

TABLE 5.
Enumeration of Exceptions to Respective Principles, by Source

Sources	Principles																									Exc./CF
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
Alb								1	3		1		1	3/2	1		1										11/10
Che			13					8	24			19/12	20/16	15/14	5/4	2	5	8		1	3	11	15/14	6			155/141
D&L									3	3		5/4	2	1	1		1					1	1			1	19/18
Fux									2			1	4/2	3/2	2	1	1	1			2		1				18/15
Jep			2						3	3		1		2	5			1						1	1	2	21
R/F								12	20	6		29/27	26/25	16	6	3	16/14	15/14		1	4	7	7	13		4	184/178
S/S									2	1					1	1		1					2				8
Sch									1			2/1	1	1		1	1	1				2					10/9
Total	0	0	15	0	0	0	0	21	58	13	1	57/48	54/47	41/38	21/20	8	25/23	27/26	0	2	9	21	26/25	20	1	7	427/401

Table 5 suggests the same number of categories for principles as did Table 3 for sources: namely, four. The first subdivision contains principles with no exceptions; the next those with 1 to 15 exceptions; the third, 20 to 27 exceptions; and the last, 41 to 58 exceptions. A listing follows, with an abbreviated statement of the original principles as found in Table 2:

I. First Subdivision: Principles With No Exceptions

A. All tones equal values
B. All whole notes
D. No intervals larger than octave
E. No dissonant leaps
F. No chromatic half steps
G. Maximum range a tenth
S. Avoid climax on leading tone

II. Second Subdivision: Principles with 1-15 Exceptions

C. Length, 8-16 tones; 15 exceptions
*J. Change Direction [minimum 3 times]; 13 exceptions
K. Not more than two leaps larger than a fourth; 1 exception
P. Change direction [into] leap of fifth or larger; 8 exceptions
T. Immediate repetition of a tone excluded; 2 exceptions
*U. No single tone sounded so often it dominates; 9 exceptions
Y. Approach final tone by step from above, by half step from below; 1 exception
Z. Next-to-last tone approached by step or by third; 7 exceptions

III. Third Subdivision: Principles With 20-27 Exceptions

H. Should contain a climax, which should not recur; 21 exceptions
O. Limit of 5 stepwise tones in same direction; 21 exceptions from 20 cantus firmi
*Q. Avoid excessive motion in one direction; 25 exceptions from 23 cantus firmi
R. Avoid dissonant intervals from first to last tones of motion in a single direction; 27 exceptions from 26 cantus firmi
*V. Avoid the repetition of a distinctive group of tones; 21 exceptions

*W. Avoid the use of sequences; 26 exceptions from 25 cantus firmi
*X. Must begin and end on [same] tonic; 20 exceptions

IV. Fourth Subdivision: Principles with 41-58 Exceptions

I. Contain two to four leaps; 58 exceptions
L. Leaps larger than a third should be followed by a change of direction; 57 exceptions from 46 cantus firmi
M. Avoid two consecutive leaps in the same direction; 54 exceptions from 47 cantus firmi
N. Avoid more than two consecutive leaps; 41 exceptions from 38 cantus firmi

*Designates those for which a more specifically delimiting clarification was supplied.

There should be no argument or problem with the principles in the first subdivision (those having no exceptions) unless, in relation to principle B regarding the exclusivity of whole-note values, one would wish to retain the possibility of dotted note values as the basis of an occasional alternative to the 4-against-1 relationship of third species or unless the proposed modification to principle S, changing "leading tone" to "seventh degree" as an inappropriate point for the climax tone, is adopted. In the second subdivision the number of exceptions is so small that there should be no question regarding pedagogical appropriateness. In fact, the last two (Y and Z) really could be a bit more restrictive and still reflect the overwhelming majority by simply declaring that the last two notes of a cantus must be scale degrees 2 1.

The principles in the third subdivision also suggest sound pedagogical practice and the number of exceptions really does not suggest a problem with the principles as much as occasional mild license or freedom by the composers. In principle O, however, a change from the Salzer and Schachter limit of five stepwise tones to six stepwise tones would result in only four exceptions to the principle, thus placing principle O back in the second subdivision. Since for principle R Salzer and Schachter put no maximum on the number of tones from the dissonant first to last notes in a unidirectional motion, all such cases become exceptions; an arbitrary maximum (which, however, was not imposed) could reduce this number. A final point is that principles Q, V, W, and X were all subject to clarifying restraints. It obviously would be possible to reduce the exceptions by relaxing the

restraints. Nevertheless the evidence in the cantus firmi does support my proposed restraints; thus the clarifications are offered in the spirit of meeting the pedagogical challenge of clarity and specificity.

The fourth and final subdivision contains the four principles with appreciably more exceptions than the other twenty-two; consequently these are the most subject to question and possible modification. In principle I, Salzer and Schachter suggest the limits of two to four leaps per cantus. The minimum of two is considered appropriate, as there are only six cantus firmi with but one leap. Changing the maximum number from four to five, however, would reduce the exceptions from 52 to 22, thus placing principle I in the more acceptable third subdivision, and thus supporting modification.

Principle L is the one with two parts: the first proposes that leaps larger than a third should be followed by a change of direction (which is the basis for counting exceptions to L); the second is that the change preferably be by stepwise motion. To the first part there are 57 exceptions; to the second there are 90. As stated earlier, for pedagogical purposes, the principle could still be considered appropriate as is. But as an alternative the suggestion is to include, with the statement of principle L, the phrase "with the exception of an ascending fourth followed either by as ascending second or by a descending third," which would reduce to 20 the number of exceptions to the first part, thereby shifting it back to the third subdivision. As the second part of principle L is stated as a "preference," exceptions to it are not included in the catalog or in the combined tally, but the suggested change would also result in the more palatable reduction of exceptions from 90 to 49.

Principle M, the prohibition of two consecutive leaps in the same direction, had 54 exceptions. The exceptions are all three-note arpeggiations of diminished, minor, or major triads, in varying positions. As with principle L it may be, for pedagogical purposes, better not to modify this principle. To reflect the practice in the cantus firmi, however, the suggestion proffered is to add the phrase "with the exception of descending major or minor triads in 5/3 position," which would reduce the number of exceptions to 26, thereby accomplishing the shift to the third subdivision.

To principle N (avoid more than two consecutive leaps) there are 41 exceptions. As with both principles L and M, one instinct accepts principle N as is, also for pedagogical reasons. By increasing the maximum from two to three consecutive leaps, however, the exceptions would be reduced from 41 to 16; therefore this is the proposed alternative.

Just as the composers did not write cantus firmi to meet the demands of theoretical principles, the Salzer/Schachter principles evidently were not meant to be a reflection of characteristics in a particular collection of cantus

firmi. While implications of these statistics are, of course, subject to personal interpretations and preferences, the comparison of cantus firmi to principles and principles to cantus firmi certainly provides some strongly corroborating evidence, as well as variety and degrees of difference. Overall results show that of the 191 cantus firmi, only 45 have no exceptions to the principles, but 123 have no more than two exceptions. Of the 26 principles only seven have no exceptions contained in any of the cantus firmi, while eight have 1 to 15 exceptions, seven have 20 to 27, and four have 41 to 58.

This prompts the double-edged question, not unrelated to the chicken-egg dilemma, of whether these results reflect a spectrum of quality concerning the tunes (are tunes with more exceptions in some way less desirable than those with fewer or none?) or do the results reflect a spectrum of quality regarding the principles (are certain principles less appropriate if several exceptions are found among the tunes in these published sources?). Given: a) that ultimately the tunes and the principles are inextricably entwined partners; b) that there is some hint of an *a posteriori* influence in the otherwise *a priori* bent of the principles; and c) that pedagogical application in the beginning study of counterpoint (via species) is at issue, both questions seem best answered in the affirmative.

Especially for the cantus firmi, but for some of the principles as well, the study therefore suggests that those of each having the greater number of exceptions need more careful consideration before their adoption and employment, especially in the pedagogical environment. Conversely, the tunes and principles with fewer exceptions do provide a telling profile of cantus firmus construction. (Obviously, were the application of the principles to extend beyond cantus firmi to include the construction of the accompanying counterpoint lines, care likewise would have to afford proper consideration to both similarities and differences.)

A final underlying issue, double-sided as well, is underscored by the results: even though one hopes to serve pedagogical goals by the presentation of clear and precise information based on appropriate evidence, a healthy allowance must be provided for items most dear to artistic creation such as choice, imagination, and individuality. It is encouraging (and, I would venture, pedagogically appropriate) to come to understand, even in a study of the short, simple (?), apparently unobtrusive cantus firmus of the abstract species exercise, that such a concept can also be discovered and appreciated.

NOTES

[1]See Piet G. Vos and Jim M. Troost, "Ascending and Descending Melodic Intervals: Statistical Findings and Their Perceptual Relevance," *Music Perception* 6/4 (Summer 1989): 383-396. The authors state that "the results of statistical analysis firmly corroborate the existence of two fundamental distributions of intervals in a wide and diverse range of Western musical style. One is the preponderance of small intervals in melodic patterns; the second . . . is that the smaller intervals occur in predominantly descending form, and the larger ones occur mainly in ascending form" (p. 389). Regarding this second characteristic the authors' experiment showed "that the regularity in question is picked up by listeners when asked to discriminate between (artificial) melodies that either are endowed with the regularity in question or are built up on the basis of the reversed intervallic features" (p.394).

In the present study the breakdown of the 1989 successive intervals in the cantus firmi is as follows: 2 perfect primes (.1%); 1263 seconds (63.4%); 412 thirds (20.7%); 217 perfect fourths (10.9%); 73 perfect fifths (3.7%): 3 sixths (.2%); 19 perfect octaves (1%). These figures appropriately reflect the first principle. A within-category breakdown is as follows: 463 ascending seconds (159 minor, 304 major = 23.3%); 800 descending seconds (255 minor, 545 major = 40.2%); 137 ascending thirds (86 minor, 51 major = 6.9%): 275 descending thirds (188 minor, 87 major = 13.8%); 177 ascending perfect fourths (8.9%): 40 descending perfect fourths (2%): 39 ascending perfect fifths (2%); 34 descending perfect fifths (1.7%); 2 ascending minor sixths (.1%); 1 descending minor sixth (1.%); 14 ascending perfect octaves (.7%): 5 descending perfect octaves (.3%). These figures agree with the second principle, showing that a greater number of the larger intervals ascend while a greater number of seconds and thirds descend (thus reflecting L. B. Meyer's "gap-fill" melodic process, as mentioned by the authors).

In teaching counterpoint it would seem appropriate to relate such points about successive melodic motion within cantus-firmus technique to the broader Western musical practice (pointing out both similarities and possible subtle differences) and to mention that a perceptual sensitivity to such characteristics does exist.

[2]David Lewin, "An Interesting Global Rule for Species Counterpoint," *In Theory Only* 6/8 (1983): 19-44.

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