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Thoughts on Voice-leading and Set Theory in "Neo-Tonal" Works: the "Hymne" from Stravinsky's *Sérénade en la*

Richard Hermann

I

Recently, much insightful work has been done with the putatively conservative, even reactionary music from the first half of this century. In particular, the musics of Bartok, Hindemith, Scriabin, and Stravinsky have received book-length discussion and numerous attending articles.¹ Earlier efforts to understand this music in the context of "extended tonal techniques" rarely went beyond mere description.² The tides of theoretical scholarship have since flowed from Schenkerian to set-theoretic, and now, to a fusion of the two approaches.³ This "neo-classical" or "centric" repertoire is at once familiar and strange to our tonally-conditioned ears. Much of Stravinsky's music evokes the Siren's call luring many a commentator's ship to destruction upon the rock, "common-practice" tonality. Stravinsky was aware of this danger and spoke on it early in his career. Specifically, with regard to the *Sérénade*, he made the following comment:

¹Only a small sample of the burgeoning literature can be cited here:

Elliot Antokoletz, *The Music of Béla Bartók* (Berkeley: University of California Press, 1984); James M. Baker, *The Music of Alexander Scriabin* (New Haven: Yale University Press, 1986); William E. Benjamin, "Tonality without Fifths," *In Theory Only* 2/11-12 (1977) 53-71, and 3/2 (1977) 9-31. David Neumeyer, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986); Joseph N. Straus, *A Theory of Harmony and Voice Leading in the Music of Igor Stravinsky* (Ph.D. dissertation, Yale University, 1981); Pieter C. van den Toorn, *The Music of Igor Stravinsky* (New Haven: Yale University Press, 1983); Paul Wilson, "Concept of Prolongation and Bartók's Opus 20," *Music Theory Spectrum* 6 (1984) 79-89.

²Leon Dallin, *Techniques of Twentieth Century Composition* (Dubuque, Ia.: W.C.Brown Co., 1964); Paul Hindemith, *Craft of Musical Composition, Book 1, Theory*, 4th ed., trans. Arthur Mendel (New York: Schott, 1942); Ludmila Ulehla, *Contemporary Harmony: Romanticism through the Twelve-Tone Row* (New York: Free Press, 1966); Vincent Persichetti, *Twentieth-Century Harmony: Creative Aspects and Practice* (New York: W.W.Norton, 1961).

³ See Appendix p. 51.

The title does not refer to its tonality, but to the fact that I had made all the music revolve about an axis of sound which happened to be the Ia.⁴

I shall proceed by reexamining, in light of the composer's words, some set-theoretic concepts for use in understanding the "Hymne". Afterwards, I shall consider some of the thorny issues confronting the "neo-tonal" approach, that is, the fusion of set-theoretic and "Schenkerian" concepts.

II

As we lack a widely accepted general theory of "neo-tonality", much less one on the so-called "neo-classical" music of Stravinsky, my inductively based interpretation can not claim to be definitive. It does, however, consider some important and frequently overlooked phenomena and offers an explanatory viewpoint that I hope will suggest further fruitful avenues of inquiry.

Figure 1 shows the form and large-scale pitch-class and set-class design of the movement. I deliberately avoid most of the traditionally-employed, formal descriptions—employing, for instance, "end-of-part signal" rather than "cadence"—as their close dependence upon "common-practice" tonal processes encourages errors of the kind Stravinsky warned against.

The movement is divided into three parts and a coda by a trilling gesture which occurs three times. Each occurrence is followed by sharp changes in register, surface durational patterning, and "vertical" pc density. The parts are labelled A, B, and C in capitalized, underscored, and outlined letters in Figure 1. These three end-of-part signals occur in bars 28 and 29, 51 and the first beat of 52, and 78 and 79. Part C is derived mostly from part A; but, since no literal or simply varied return occurs, the piece is through-composed. For each of the subsections, indicated by lower case letters with superscripts; the actual pcs are shown as well as the sets are in prime form. Note that pcs in bold face are not included in the immediately preceding subsection's pc collection. Outlined pcs are those which complete the aggregate for its section or part. As

⁴ Igor Stravinsky, *Autobiography* (New York: Simon and Schuster, 1963; reprint, New York: W.W.Norton, 1962) 124.

Babbitt recently reminds us, aggregate completion is of great interest for "neo-tonal" composers; this movement bears that out.⁵

Casual inspection provides much supporting evidence for the claim that the "priority pc" of the "Hymne" is A. Outer voice octave doublings, comparatively rare in this movement, employ pc A. In one or both of the outer voices pc A is held invariant, via set intersection, in beginnings and endings of both the movement as a whole as well as in most sections and subsections of part A.

As can also be easily confirmed from Figure 1, the "Hymne" also has a "referential set-class" 8-23, the most frequently occurring large-scale set-class. It has a "home key" collection of pcs: {A, B \flat , B, C, D, E, F, G}. This set-class is inversionally symmetrical; later, this property will produce some unexpected results. Unfortunately, as happens too frequently, this set's prime form obscures the ready apprehension of its symmetry in the abstract.

The rate of aggregate completion is very slow, thus assuring that the pc and pitch transformations of transposition, inversion and their combination do not reveal the work's pitch structure as permutational in nature. That is, those transformations—excluding, of course, the identity transformations—produce pc sets or series with pcs outside of the "home key," and do not, as in the case of a serial piece which employs all 12 pcs in its orderings, permute order positions.⁶ Nonetheless, these transformations remain invaluable in describing and explaining idiomatic structure in neo-tonal music—including that of Stravinsky. Thus, the "Hymne" has four of what I consider to be the principal hallmarks of neo-tonality: a non-permutational pitch structure, a "referential" pc; a "referential" set-class and "home key" pcs.

⁵Milton Babbitt, *Words About Music: The Madison Lectures*, eds., Stephen Dembski and Joseph N. Straus (Madison, Wi.: University of Wisconsin Press, 1987) 154-155. The earliest discussion of this topic that I know of is: Stefan Wolpe, "Thinking Twice," *Contemporary Composers on Contemporary Music*, Elliot Schwartz and Barney Childs, eds., (New York: Holt, Rinehart and Winston, 1967) 274-307.

⁶Milton Babbitt, "Twelve-Tone Invariants as Compositional Determinants," *Musical Quarterly* 46/2 (April, 1960); reprinted in *Problems of Modern Music*, ed. Paul Henry Lang (New York: W.W.Norton, 1962) 109. Babbitt called non-permutational pieces "combinatorial." I believe this is too general a statement. For instance in "common practice" tonality it would suggest that any permutation of the following set of pitch-class and name-class pairs: {(0,C), (4,E), (7,G)} are equivalent in function. I am sure he does not intend this.

Figure 1 "Form", Pc, & Set-Class Design in the "Hymne"

A bars 1-29, Set-classes employed: (10-5, 8-23, 8-Z15, 6-Z40)

Section 1, bars 1-14, Pcs and Set-classes employed: (lacks pcs G# & D#)

(10-5, 8-23, 6-Z40) (A, B \flat , B, C, C#, D, E, F, F#, G) 10-5 [0,1,2,3,4,5,6,7,8,10]

bars

a ¹	1-2	(A, B \flat , B, C, D, F)	6-Z40	[0,1,2,3,5,8]
a ²	3-6	(A, B \flat , B, C, D, E, F, G)	8-23	[0,1,2,3,5,7,8,10]
b ¹	7-11	(A, B \flat , B, C, D, E, F, G)	8-23	[0,1,2,3,5,7,8,10]
b ²	12-14	(A, B \flat , B, C, C#, D, E, F, F#, G)	10-5	[0,1,2,3,4,5,6,7,8,10]

Section 2, bars 15-27, Pcs and Set-classes employed: (10-5, 9-6, 8-23, 8-Z15), all pcs

bars

a ³	15-19	(A, B \flat , B, C, D, E, F, G)	8-23	[0,1,2,3,5,7,8,10]
c ¹	20-22	(A, A#, B, C#, D#, E, F#, G#)	8-23	[0,1,2,3,5,7,8,10]
d ¹	23-25	(A, B, C, D, E, F, G)	7-35	[0,1,3,5,6,8,10]
d ²	26-27	(A, A#, B, C#, D, E, F#, G#)	9-6	[0,1,2,3,4,5,6,8,10]

End-of-part signal ("Cadence?")

bars

e ¹	28-29	(A, B, C, D#, E, F, F#, G)	8-Z15	[0,1,2,3,4,5,7,8,9]
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B bars 30-51, Set-classes employed: (10-2, 9-11, 9-9, 8-26, 8-18, 8-11, 7-35, 7-30, 6-31, 6-Z26, 6-Z25, 7-32)

Section 1, bars 30-41, Pcs and Set-Classes employed: (9-11, 9-9, 7-35), all pcs, [0...12]

bars

f ¹	30-35	(A, B, C, C#, D, E, F#, G, G#)	9-9	[0,1,2,3,5,7,8,9,10]
g ¹	36-38	(A, B, C#, D#, E, F#, G#)	7-35	[0,1,3,5,6,8,10]
h ¹	39-41	(A, B \flat , C, C#, D, E, F, F#, G)	9-11	[0,1,2,3,5,6,7,9,10]

Section 2, bars 42-50, Pcs and Set-classes employed: (8-26, 8-18, 8-11, 7-30, 6-Z26, 6-Z25), all pcs, [0...12]

		<u>bars</u>									
f ²	42-44	{A,	B,	C,	D,	D [#] ,	E,	F,	G [#]	8-18	[0,1,2,3,5,6,8,9]
	(42)	{A,		B [#] ,	C [#] ,		E,	F [#] ,	G [#]	6-31	[0,1,3,5,8,9]
	(43-44)	{A,	A [#] ,	B,	B [#] ,	C [#] ,		E,	F [#] ,	G [#]	8-11 [0,1,2,3,4,5,7,9]
f ³	45-46	{	A [#] ,	B [#] ,	C [#] ,		E,	E [#] ,	F [#] ,	G [#]	7-30* [0,1,2,4,6,8,9,]
	47	{A,	B,				D [#] ,	E,	F [#] ,	G [#]	6-Z25 [0,1,3,5,6,8]
	48	{A,	B,	B [#] ,	C [#] ,		D [#] ,	E,	F [#] ,	G [#]	8-26 [0,1,2,4,5,7,9,10]
h ²	49-50	{A,	B,	C,				E,	F,	G}	6-Z26 [0,1,3,5,7,8]

End-of-part signal ("Cadence"?)

		<u>bars</u>									
e ²	51-52	{A,	B,	+C?,			D [#] ,	E,	F [#] ,	G}	6-Z24/7-32?[0,1,3,4,6,8]+9?

C* bars 52-77, Set-Classes employed: (9-4, 8-23, 7-35, 6-32, 6-Z26)

*Material derived from part A

Section 1, bar 52-through 1st dotted quarter of bar 63, Pcs and Set-classes employed: (7-35), (B, C, D, E, F, G, A), [0,1,3,5,6,8,10], Lacking "Black Keys"!

		<u>bars</u>									
j ¹	52-58	{A,	B,	C,	D,	E,	F,	G}	7-35	[0,1,3,5,6,8,10]	
k ¹	59-63	{A,	B,	C,	D,	E,	F,	G}	7-35	[0,1,3,5,6,8,10]	

Section 2, bar 64-through 1st dotted quarter of bar 69, Pcs and Set-classes employed: (9-4, 8-23, 7-35), all pcs, [0...12]

		<u>bars</u>									
l ¹	64-65	{A,	A [#] ,	B,	C [#] ,	D,	D [#] ,	E,	F,	F [#]	9-4 [0,1,2,3,4,5,7,8,9]
h ³	66-67	{A,	B,	C,	D,	E,	F,	F [#] ,	G}	8-23 [0,1,2,3,5,7,8,10]	
j ²	68-69	{	A [#] ,	B [#] ,	C [#] ,		D [#] ,	E [#] ,	F [#] ,	G [#]	7-35* [0,1,3,5,6,8,10]

Section 3, bar 70-through 1st quarter of bar 77, Pcs and Set-classes employed:

(8-23, 7-35, 6-32, 6-Z26), (E, F, F#, G, G#, A, Bb, C, C#, D), [0,1,2,3,4,5,6,8,9,10] Lacking pcs B & D#.

bars

k ²	70-71	(Bb,	C,	Db,	F,	Gb,	Ab)	6-Z26	[0,1,3,5,7,8]	
	72	(A,	C,	D,	E,	F,	G)		6-32	[0,2,4,5,7,9]	
k ³	73-74	(A,	Bb,	C,	D,	E,	F,	G)	7-35	[0,1,3,5,6,8,10]	
k ⁴	75-77	(A,	B,	C,	D,	E,	F,	F#,	G)	8-23	[0,1,2,3,5,7,8,10]

CODA, bar 78 with pick-ups-81, Pcs and Set-classes employed: (8-26, 8-21, 7-35, 7-33, 6-34, 5-35), 10-2, [0,1,2,3,4,5,6,7,8,10], Lacking pcs F# & G#.

Section 1, bar 77-78, Set-classes employed: (7-35, 6-34), 8-26, [0,1,2,4,5,7,9,10]

bars

a ⁴	77-78	(A,	Bb,	C,	D,	E,	F,	G)	7-35	[0,1,3,5,6,8,10]
	(78)	(A,	B,	C#,	D,	E,	F,	G)	6-34	[0,1,3,5,7,9]

End Signal Section, bars 79-81, Set-classes employed: (7-33, 5-35), 8-21, [0,1,2,3,4,6,8, 10]

End-of-Part Signal ("Cadence"?), Set-Class employed: (7-33)

bars

e ³	79	(A,	B,	C#,	D#,	E,	F,	G)	7-33	[0,1,2,4,6,8,10]
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End-of-Movement Signal ("Cadence""?), Set-Class employed: 5-35

bars

e ⁴	80-81	(A,	B,	D,	E,	G)	5-35	[0,2,4,7,9]
----------------	-------	-----	----	----	----	----	------	-------------

* The two subsections whose set-class names are marked with an asterisk are the only two subsections which do not hold the pc A!

Figures 2 and 3, respectively give the set complex and set similarity relations for the set-classes for Figure 1. A conventional unordered set-theory analysis requires three nexus sets to connect all of the set-classes in Kh/K* relations: 6-32—the major diatonic hexachord, prime form [0,2,4,5,7,9]; 6-34—prime form [0,1,3,5,7,9]; and 6-Z40—prime form [0,1,2,3,5,8]. Only set-classes 9-4, 9-9, and 9-11 hold all three in the Kh/K* relation and no similarity relation holds any two of the hexachordal nexus sets in common much less all three.⁷ For that matter, no similarity relation holds any two of the three nonochords either. Furthermore, none of the nonochords holds both of the two most important set-classes in the piece, 8-23 and 8-Z15.⁸ Thus, a conventional unordered set-theoretic analysis is not as revealing as we might hope for. Figure 4 shows the pc structure of the end-of-part signals.

Another manner of displaying and interpreting the set-classes is given in Figure 5. The most infrequently appearing set-classes from Figure 1 are "pruned away"; a tree structure shows the interrelationships of the remaining set-classes along with many of the important set-classes routinely found closer to and on the surface of the piece.⁹ The 8-23 "branch" of the tree provides the set-classes of the work's normal discourse and the 8-Z15 branch, in conjunction with a trilling gesture, provides the ending signals' set-classes for the work's large-scale pitch relations. The set-classes connected to both "branches" serve as "common chords" between the two functions. Note in particular the 6-Z40, which is the very set-class of the opening subsection, is the largest set-class to connect both worlds.¹⁰

⁷ Recall that the Kh relation is not always transitive. See Allen Forte *The Structure of Atonal Music* (New Haven: Yale University Press, 1973) 102-104.

⁸ Van den Toorn, following Berger, claims that the set-classes 8-28 and 7-35 are of prime importance in much of Stravinsky's work (see *The Music of Igor Stravinsky*, xv). Here, of course, we find a counter-example.

⁹ The various roles of some of the omitted set-classes will be discussed throughout the paper. It is of interest to note that the set-classes which can be traced through either or both of the two "branches" possess a high degree of transitivity in their set-complex relations.

¹⁰ Note the 3-1 set-class, which is immediately played by the left hand, marks the 6-Z40 off from the 7-35 or "diatonic collection". Any conventional tonal explanation of the E_b and B as passing or neighboring tones is forced at best.

Figure 2: Set-complex relations

(Kh & K*/K) →	(8/2)	(7/5)	(6/3)	(3/3)	(6/2)	(8/4)	(3/4)	(5/5)
	4-Z29	8-26	8-23	8-21	8-18	8-Z15	4-13	8-11
(8/1) 5-35/7-35	K*	Kh	Kh					
(2/5) 7-33	K			Kh		K		
(8/3) 7-32	K*	Kh			Kh	Kh	K	
(8/1) 5-30/7-30	K*	K				Kh		
(9/1) 6-Z40	K*	K	K*		Kh	K*	Kh	Kh
(8/1) 6-34	Kh			Kh		Kh		K
(7/0) 6-32		Kh	Kh					Kh
(8/1) 6-31		K			Kh	Kh		Kh
(8/1) 6-Z26		K*	K*			K*		K
(10/2) 6-Z25	K	K*	Kh		K*	K*	Kh	
(10/1) 6-Z24		K*	K	K*	K*	Kh	K*	Kh
(11/8) 9-9	K*	K	Kh	K	K	K	K	K
(10/9) 9-4	K*	K	K	K	K	K	K	Kh
(13/6) 9-11	Kh	Kh	K	K	Kh	K	K	K
	6-Z40	6-34	6-32	6-31	6-Z26	6-Z25	6-Z24	
5-35/7-35			Kh		K*	K*		
7-33		Kh						
7-32				Kh		K*	K*	
5-30/7-30		Kh		Kh	K*			
9-9	K*	Kh	Kh	Kh	Kh	Kh	Kh	
9-4	K*	Kh	Kh	Kh	Kh	Kh	Kh	
9-11	Kh	Kh	Kh	Kh	Kh	Kh	Kh	
	9-9	9-4	9-11					
5-35/7-35	Kh	K	Kh					
7-33	K	K	K					
7-32	K	K	K					
5-30/7-30	Kh	Kh	Kh					

Nexus Sets: 6-32, 6-34, & 6-Z40.

N.B.:

1.) They are not in any similarity relation with one another.

2.) Set-classes 9-11, 9-9 and 9-4 hold the hexachords in Kh/K*.

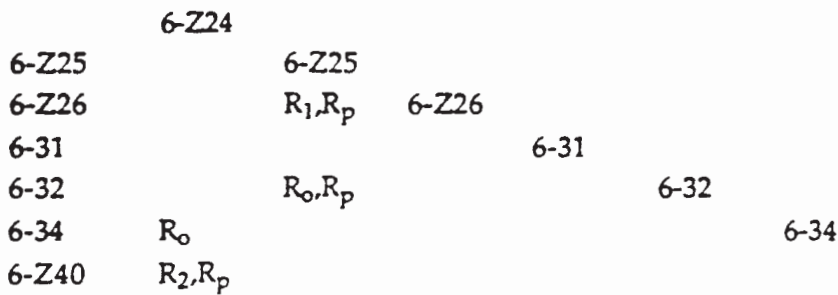
3.) Set-class 9-9 holds Set-class 8-23 but not 8-Z15 in Kh/K*. Set-classes 9-11 and 9-4 hold neither.

Set-class 10-2 is not a superset to these Set-classes: 9-11, 9-4, 8-18.

Set-class 10-5 is not a superset to these Set-classes: 8-21, 7-33.

Figure 3: Forte Similarity Relations

"Formal", Large-Scale Set-Class Similarity Relationships



Set-Class	Prime Form	Interval Vector
6-Z24	[0,1,3,4,6,8]	<2,3,3,3,3,1>
6-Z25	[0,1,3,5,6,8]	<2,3,3,2,4,1>
6-Z26	[0,1,3,5,7,8]	<2,3,2,3,4,1>
6-31	[0,1,3,5,8,9]	<2,2,3,4,3,1>
6-32	[0,2,4,5,7,9]	<1,4,3,2,5,0>
6-34	[0,1,3,5,7,9]	<1,4,2,4,2,2>
6-Z40	[0,1,2,3,5,8]	<3,3,3,2,3,1>

N.B.: 1). Only 6-31 is not connected to any of the other hexachords.

2). Two successions (?):

- a. 6-Z40 <-R₂,R_p-> 6-Z24 <-R₀-> 6-34
- b. 6-32 <-R₀,R_p-> 6-Z25 <-R₁,R_p-> 6-Z26

	8-11					(5 of 8)
4-13		4-13				(4 of 8)
8-Z15	R ₂ ,R _p	R ₂ ,R _p	8-Z15			(6 of 8)* maxima
8-18	R ₁ ,R _p		R ₂ ,R _p	8-18		(5 of 8)
8-21	R ₀ ,R _p	R ₀	R _p	R ₀	8-21	(5 of 8)
8-23	R ₀		R ₀ ,R _p	R ₀	8-23	(3 of 8)*
8-26		R ₂ ,R _p			R ₁ ,R _p	8-26 (2 of 8) minima
4-Z29	R ₂ ,R _p	R ₂ ,R _p	R ₂ ,R _p	R ₂ ,R _p		(4 of 8)

* Most important octads in piece!

Set-Class	Prime Form	Interval Vector
8-11	[0,1,2,3,4,5,7,9]	<5,6,5,5,5,2>
4-13	[0,1,3,6]	<1,1,2,0,1,1>
8-Z15	[0,1,2,3,4,6,8,9]	<5,5,5,5,5,3>
8-18	[0,1,2,3,5,6,8,9]	<5,4,6,5,5,3>
8-21	[0,1,2,3,4,6,8,10]	<4,7,4,6,4,3>
8-23	[0,1,2,3,5,7,8,10]	<4,6,5,4,7,2>
8-26	[0,1,2,4,5,7,9,10]	<4,5,6,5,6,2>
4-Z29	[0,1,3,7]	<1,1,1,1,1,1>

7-30

7-32		7-32	
7-33	R_o, R_p	R_o	7-33
7-35	R_o, R_p	R_o, R_p	

Set-Class	Prime Form	Interval Vector
7-30	[0,1,2,4,6,8,9]	<3,4,3,5,4,2>
7-32	[0,1,3,4,6,8,9]	<3,3,5,4,4,2>
7-33	[0,1,2,4,6,8,10]	<2,6,2,6,2,3>
7-35	[0,1,3,5,6,8,10]	<2,5,4,3,6,1>

N.B.: These set-classes are intervallically distinct and most are capable of holding all but one pc in common.

9-4

9-9		9-9
9-11		

Set-Class	Prime Form	Interval Vector
9-4	[0,1,2,3,4,5,7,8,9]	<7,6,6,7,7,3>
9-9	[0,1,2,3,5,6,7,8,10]	<6,7,6,6,8,3>
9-11	[0,1,2,3,5,6,7,9,10]	<6,6,7,7,7,3>

Figure 4: End-signs (Cadence?)

Form	Measures bars	Set-Class	Pitch-Classes	Prime Form
A,e ¹	28-29	8-Z15	{D#, E, F, F#, G, A, B, C}	[0,1,2,3,4,6,8,9]
B,e ²	51	6-Z24	{D#, E, F#, G, A, B}	[0,1,3,4,6,8]
or				
	(+52)	7-32	{D#, E, F#, G, A, B, C}	[0,1,3,4,6,8,9]
C*,e ³	78-79	7-33	{D#, E, F, G, A, B, C#}	[0,1,2,4,6,8,10]
e ^{4**}	80-81	5-35	{D, E, G, A, B} if D# = 0; then:	[0,2,4,7,9] [11,1,4,6,9]

** Functions as "End-of-Piece Signal"

* "C Total" 8-21 {D, D#, E, F, G, A, B, C#} [0,1,2,3,5,6,8,10]

Lacking pcs Bb, G#, C, & F#; therefore, no phrygian mode on A as per Edward T. Cone: "Progress of a Method".

"Grand Total" 10-2 (lacking Bb & G#)

A,e¹ B,e² C,e³
8-Z15 \cap 7-32 (or 6-Z24) \cap 7-33 = 5-30 {D#, E, G, A, B}, [0,1,4,6,8]

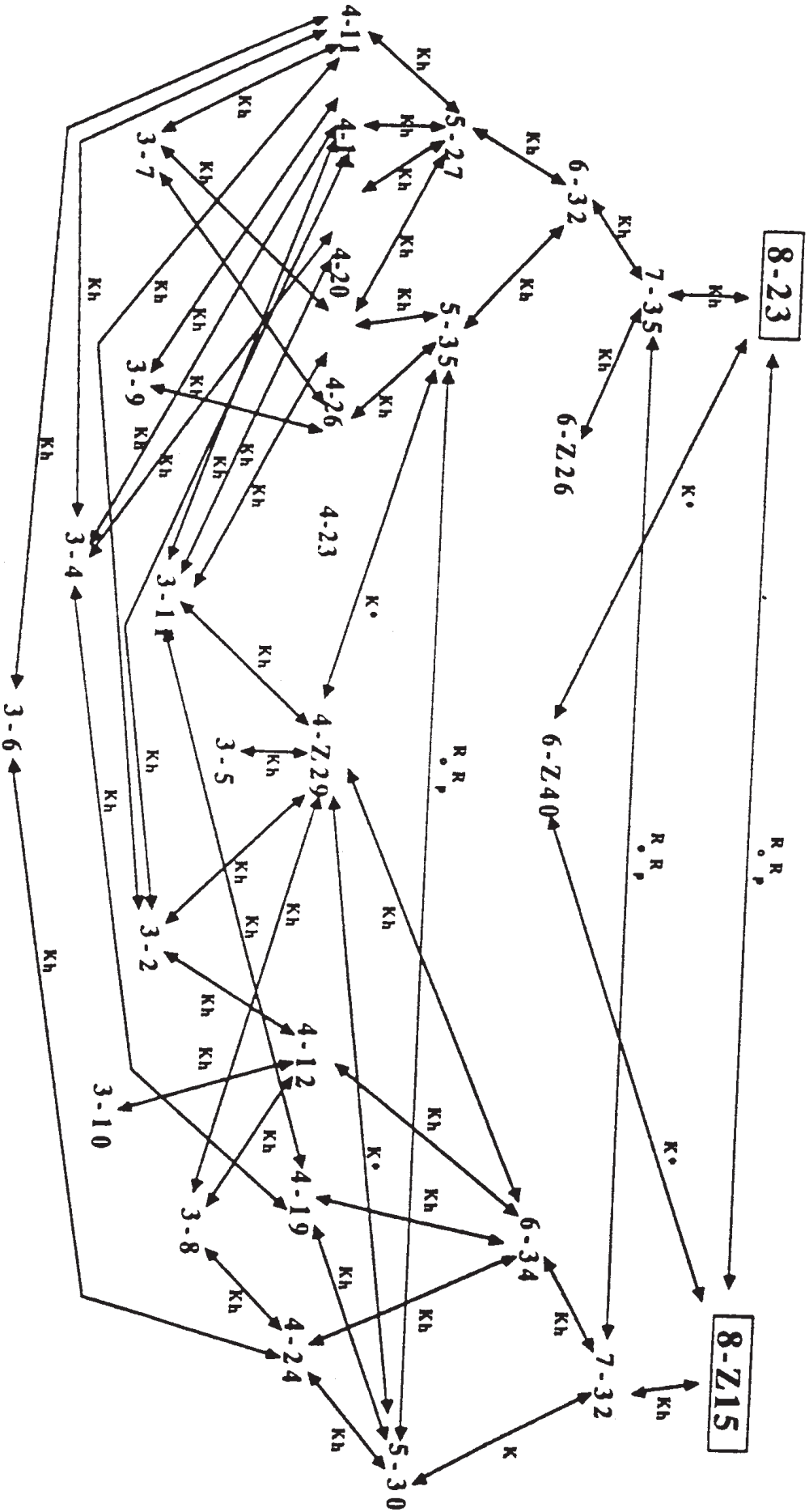
Set-Complex of the "Cadences"

	7-33	7-32	5-35	
8-21	Kh			8-21
8-Z15		Kh		8-Z15
6-Z24		K*		K* K*

Similarity Relations in the "Cadences"

8-21 & 8-Z15 = R_p; 7-33 & 7-32 = R_o; 7-32 & 5-35 = R_o, R_p; 7-30 & 5-35 = R_o, R_p;

Figure 5



Set-classes 8-23 and 8-Z15 are in the R_o and R_p similarity relations. Thus there exists a pc level for both set-classes in which they share all but one pc—a property heavily exploited in this piece; yet, they also have maximally dissimilar intervallic structures. This, then is an elegant manner of obtaining both coherence and differentiation of function. In this case, there are two pc differences between 8-23's "home key" pcs and the 8-Z15 "cadential" pcs. Pcs $B\flat$ and D are unique to the "home key" 8-23 and pcs $F\sharp$ and $D\sharp$ are unique to the "cadential" 8-Z15. The last two pcs figure quite prominently in the end-of-part signal at bars 28 and 29.

One of those two pcs, $D\sharp$, completes the total chromatic in bar 21. This completion leads me to suggest two ways to view pc, pitch, and intervallic structure in this music, ways which contribute other dimensions of understanding to Stravinsky's use of the terms "poles" and "axes," usually taken to mean pc inversive symmetry.¹¹ The first of these ways concerns those transformations which retain the pc content of set-classes as subsets of the "home key" pc-collection and those transformations which exchange some "home key" pcs for pcs "foreign" to it. Thus the function of a specific T_n or $T_n(\Omega)$ level can itself change in the course of a work depending upon whether it produces or maintains "home key" pcs only or obtains or maintains "foreign" pcs. Eventually, the "foreign" pc transformations complete the aggregate and signal the return to the "home key" pc-collection. The other important way of viewing pc, pitch and intervallic structure is set-class selection. By choosing set-classes "foreign" to the referential set-class world, which includes its subsets and supersets, another means of structural contrast is obtained. Naturally, local "common-tones" and local "common set-classes" can be used to soften the "modulations," and immediately introduced pc-sets with maximum locally

¹¹ In Igor Stravinsky's *Poetics of Music in the Form of Six Lessons*, preface by George Seferis, trans. Arthur Knode and Ingolf Dahl (Cambridge, Mass.: Harvard University Press, 1942) we find many references to suggestive terms such as "poles of attraction," "general law of attraction," "pole of sonority," of which "...it is still impossible to lay down the rules that govern this new technique." See pages 35-37. For another view of this issue, see: Marianne Kielian-Gilbert, "Pitch-Class Function, Centricity, and Symmetry as Transposition Relations in Two Works of Stravinsky" (Ph. D. dissertation, University of Michigan, 1981), and Kielian-Gilbert, "Relationships of Symmetrical Pitch-Class Sets and Stravinsky's Metaphor of Polarity," *Perspectives of New Music*, 21, (1982-83) 210-221.

"foreign" set-classes can be used to heighten a dramatic effect. The globally "foreign" pcs, $(C\sharp, D\sharp, F\sharp, G\sharp)$, are found in bar 48. This bar is an instance of the furthest possible distance obtainable in terms of the two ways of viewing structure mentioned above. Thus these two can be played against one another; in this manner both "tension" and "neo-tonal" direction are achieved. The largest-scale "resolution" of these forces is the return of both the referential set-class and the "home-key" pc-collection or significant subsets of these. Lesser-scale "resolutions" are returns to either the "home key" pc-collection or the referential set-class—or significant subsets of them. Far from providing structural "tension," rhythm—along with register, gesture, and so forth underlines the changes of relation between these two structural forces.

To see more concrete examples of these forces at work, a detailed "mid-ground" view of Part A is apropos. See the score and Figure 1. Section 1, bars 1 to 14, starts with the previously mentioned 6-Z40, an important subset of both set-classes 8-23 and 8-Z15. With the addition of pcs E and G, the referential set-class, 8-23, is obtained at its "home key" pc level in subsection a², bars 3-6. The same set-class persists in subsection b¹, bars 7 to 11. The addition of the pcs $C\sharp/D\flat$ and $F\sharp/G\flat$ creates 10-5, $[1,2,3,4,5,6,7,8,9,10]$, a superset of 8-23. In bar 15, the start of section 2, the referential pc set-class, 8-23, returns at its home pc level with the opening gesture. Subsection c¹, bars 20 to 22, employs new surface gestures and features a transformation of the "home key" 8-23 into another instance of set-class 8-23 which produces all possible "foreign" pcs thus completing the aggregate. As set-class 8-23 is inversionally symmetrical it has two degrees of symmetry—there are twelve rather than twenty-four distinct collections of pcs available to it.¹² The collection of pcs that Stravinsky employs in subsection c¹ is described by the transformation T_{11} or $T_2(I)$ upon the home collection pc. It is one of five such transformational pairs employed which produce all the "foreign" pcs.¹³ The transformational pair employed is,

¹² The number of operations which map a pc-set onto itself is the number of degrees of symmetry of that pc-set. See John Rahn, *Basic Atonal Theory* (New York: Longman, 1980) 91.

¹³ The other transformational pairs are: $T_1/T_4(I)$, $T_4/T_7(I)$, $T_6/T_9(I)$, and $T_8/T_{11}(I)$. Methods for obtaining these results can be found in: Bo Alphonse, "The Invariance Matrix," (Ph.D. dissertation, Yale University, 1974); Carlton Gamar and Paul Lansky, "Fanfare for the Common Tone," *Perspectives of New Music* 14/2 and 15/1 (Spring-Summer and Fall-Winter) 229-235; Robert Morris *Composition with Pitch-Classes* (New Haven: Yale University Press, 1987) 109-114; Rahn, 111-115, 122n.

however, the only one which holds the pc-set $\{A, B\}/\{A\#, B\}$ invariant—as common tones—and it is that subset, and only that subset, that is maintained throughout Part A. Recall that this subset is the left hand's starting gesture and there resists conventional tonal explanation. The end-of-part signal of bars 28 and 29, e^1 , returns to all but two of the home pcs as previously mentioned and thus provides a limited structural resolution while reiterating the very pc that completes the aggregate, $D\#$.

From this point on I shall abandon comment on pc structure at these levels and refer the reader to Figure 1 for discovery, at his leisure, of other, unmentioned aspects. Now that the context for the work's pc structure is established, it is time to turn to the details of its compositional realization. First, the "harmonic" world is examined, then the "melodic."

Inspection of Part A reveals the trichord as the predominant unit of "harmonic" analysis—that is, those places with simultaneous attack-points of two or more pcs. The most frequently used trichord is 3-11, the major or minor triad, and the next trichord is 3-7, $[0,2,5]$. By comparison other trichords are rarely used and they frequently assume special roles. For instance, trichords 3-5, $[0,1,6]$, and 3-8, $[0,2,6]$, are two of the three trichords which contain the interval-class 6. These two "harmonies" are used in the ultimate or penultimate positions of several sections and subsections and are usually stressed metricaly.¹⁴ Thus at local levels, these trichords seem to participate in end-of-section or subsection roles echoing the same function that set-class 8-Z15 performs on the large-scale. See instances in bars 11, 14, 27, and 65.

Those few tetrachords which are prominent all hold at least one major or minor triad within them. Without a general theory of "neo-tonal" counterpoint, which in turn would have to rest upon a general theory of "neo-tonal" consonance and dissonance, we are hard pressed to account for the remaining pc other than on grounds of set-inclusion or as part of a pattern of registrally ordered intervals. To call them "passing tones" or "neighboring tones" is, at

¹⁴ What meter is in "neo-tonal" music I shall not attempt to define here. Agogic stress, multiple attack-point patternings, and contour lend some support to the "Hymne's" notated meters; however, Stravinsky varies these parameters with brilliant rhythmic effect throughout. It is also of interest that all trichords which contain ic6 are in the Kh relation with some set-classes of the 8-Z15 "branch" and not with any set-classes of the 8-23 "branch" furthering underlining their "cadential" character. See Figure 5.

worst, to beg the question and, at best, to describe aspects of the phenomenon's contour. Perhaps statistical counts leavened by probability could suggest pitch, pc, and intervallic designs in individual cases; and these in turn could then be used to justify these two voice-leading concepts. I shall have more to say on that issue later.

Figure 6a gives all members of the set-class 3-11 contained by the referential set-class 8-23 at the referential pc level in a canonical form. By canonical, in this discussion, I mean an RI invariant presentation of all of a set-class's pcs.¹⁵ Figure 6b gives the transformations that map some 3-11 pc-sets within an 8-23 pc-set onto some other 3-11 pc-sets within that same 8-23 pc-set.¹⁶ Figure 6c shows a very significant canonical form for the "Hymne" of set-class 8-23 (at the "home" pc level) from the several available to it.

This structure of 3-11 set-classes within the 8-23 set-class serves to connect some important "harmonic" aspects of Part A. Chords 4 through 6 from Figure 6a and some of their 4-pc concatenations provide the surface "harmonies" in subsections a1, a2 (bars 1-6), and a3 (bars 15-19). Chords 5 through 7 from Figure 6a form the 3-11 "harmonies" at that point where a significant subset of the referential pc-collection returns in subsection d¹, at the last half of bar 22 and the first half of bar 23. The role of the first three chords in Figure 6a are not "har-

¹⁵ Rahn (pp. 88, 91) defines a canonical ordering as follows: "Two sets are related by T_nI if and only if they each can be written in a 'canonical ordering' with respect to each other.' A 'canonical ordering' is an 'ascending' ordering such that the adjacency-interval series of the canonical orderings of both sets are mutually retrogradable." Here, I do not compare two sets; but, instead, display various inversionally-symmetrical resources of the "home key" sets of pcs.

¹⁶ As performing transposition or inversion followed by transposition in this piece does not permute the order positions of a series of pcs and can result in new pcs outside of the referential pc collection, they are not "onto" or "one-to-one." Therefore, they shall be called transformations in this instance and not operations. Operations necessarily result in permutations of the pc's orderings. In this I follow the lead of David Lewin in his *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press, 1987) 3-4.

Lewin has pointed out the power of inversional relationships in this century's music and the theoretical and analytical importance of changing the pc pair about which inversion displays the pcs in the following two articles: "Inversional Balance as an Organizing Force in Schoenberg's Music and Thought," *Perspectives of New Music* 6/2 (Spring-Summer, 1968) 1-2, and "A Label-Free Development for 12-Pitch-Class Systems," *Journal of Music Theory* 21/1 (Spring, 1977) 29-48. I adopt his manner of notation of inversion about a pair of pcs, I^{xy} , where x and y are different pcs. Note that in different sections or even subsections of the "Hymne" it is necessary to perform inversions about still other pc pairs than the ones mentioned in my discussion of Part A, specifically A and $E_b/D\sharp$, and E and F.

monic" in Part A; their role in the "melodic" structure of the "Hymne" will be discussed later.

Figure 6a: A "Canonical" display of 3-11s in 8-23 at the referential pc level.

1. *	G	B \flat	D				
2.		B \flat	D	F			
3.			D	F	A		
4.				F	A	C	
5.					A	C	E
6.						C	E G
7.							E G B
8.							G B D

N.B.: The following pairs of 3-11s are related by the transformation $T_0(I)$ with I A, Eb/D \sharp
1 & 8, 2 & 7, 3 & 6, 4 & 5.

* The numbers in this column are used to facilitate discussion in the text and in figure 6 b.

Figure 6b: Some mappings of set-class 3-11 onto others within an 8-23, arranged by numbers of pcs in common. (Numbers represented by X and Y refer to those positions of set-class 3-11, as indicated for a particular instance of 8-23 in figure 6a, for any 8-23.)

1. Those transformations which hold 2 pcs in common

X onto Y or Y onto X			X onto Y or Y onto X		
1	T ₃ (I)	2	1	T ₀ (I)	8
2	T ₁₀ (I)	3			
3	T ₅ (I)	4			
4	T ₀ (I)	5			
5	T ₇ (I)	6			
6	T ₂ (I)	7			
7	T ₉ (I)	8			

N.B.: In the first column the transforms can be generalized as T_n + T7(I).

2. Those transformations which hold 1 pc in common.

X onto Y / Y onto X			X onto Y or Y onto X		
1	T_5/T_7	3	1	$T_9(I)$	7
2	"	4	2	"	8
3	"	5			
4	"	6			
5	"	7			
6	"	8			

N.B.: Generalize transformations by inspection.

3. Those transformations which hold no pcs in common.

A			B			C		
X onto Y or Y onto X			X onto Y / Y onto X			X onto Y or Y onto X		
1	$T_{10}(I)$	4	1	T_2/T_{10}	5	2	$T_0(I)$	7
2	$T_5(I)$	5	2	"	6	3	"	6
3	$T_0(I)$	6	3	"	7	3	$T_7(I)$	8
4	$T_7(I)$	7	4	"	8			
5	$T_2(I)$	8						

N.B.: The transforms in column A can be generalized as $T_n + T_7(I)$.
Column B generalized by inspection.

Figure 6c: An important "melodic", "canonical" ordering of set-class 8-23 at the referential pc level

Intervals:	-1	-2	-2	-1	-2	-2	-1	
Pcs:	B_b	A	G	F	E	D	C	B

N.B.: This is the "Great Concatenation" of the Motive <1,2,2> mentioned in the text.

In the larger scope of part A the set-class 3-11 has functions outside of that dictated by its inclusion in set-class 8-23. The large-scale motion of section 1 is from an F-major triad to an A-major triad and the suppression of "harmonic" 3-11s in subsections b¹ and b² underline the return at the very end of subsection b² of the set-class 3-11, that very A-major triad. Note that this is a T₄ transformation which, in the large, echoes the right hand's initial and frequently repeated melodic move in the piece, pc A down four semitones to pc F. Note also that the right hand of subsection b¹ is transposed down an octave from its source, a¹ and a²; has its alto voice and octave-doubling omitted; and has the bass transposed down a perfect 5th to accomplish the suppression of set-class 3-11.¹⁷ More on this passage will follow. The large-scale move in section 2 is from an F-major triad to a C-major triad. Again, the set-class 3-11 is suppressed as a "harmony" from the second half of bar 23 through bar 27. Note that the introduction of "foreign" pcs in bars 26 and 27, a move away on the pc front, and the return of all but one of the "home" pcs—a returning move on the pc front—are coordinated with the return of the set-class 3-11 in the e¹ subsection, which is the end-of-part signal at bars 28 and 29. Both total moves, F-major to A-major and F-major to C-major, establish a major triad member of set-class 3-11 upon each of the pcs of the F-major triad and they summarize the motion from the "home" pc collection to "foreign" pcs and back to the "home" pc collection in part A. Finally, a lower-level detail of interest is found on successive first beats in bars 21 through 23: a T₄ cycle of 3-11s returns to the "home" pc collection from pc collections rich in "foreign" pcs.

Many important and easily audible "melodic" events occur in the outer voices. For instance, the beginning and ending bass-notes of subsections a¹, a², and b¹, bars 1 to 11, form the ordered pc set, <A, D, G>. Note that the ending

¹⁷ In his article, "Progress of a Method", *Perspectives on Schoenberg and Stravinsky*, rev. ed. Benjamin Boretz and Edward T. Cone, eds. (New York: W.W.Norton, 1972) 157 (his example 2), Cone maintains that bars 7-14 constitute the main B material which works with the opening A material via his formal processes of stratification, interlock, and synthesis to shape the movement. I have shown that this material is clearly derived from the a¹ and a² subsection materials. The materials found in bars 20-27 provide far better contrast for his purposes. His claim for the movement as being in the phrygian mode can now be superceded by more precise descriptions of its pitch structure.

harmony of subsection b¹, found on beat 2 of bar 11, has that exact same pc ordering in space, <A4, D4, G2>. This 3-9 pc-set appears to function as an analog for the tonal "deceptive cadence." A closer look at this passage's bass line yields the following structure nested within the one just pointed out: if we include with the beginning and ending pcs of the bass voice in subsections a¹, a², and b¹ those pcs which are emphasized with simultaneous or immediately occurring "melodic" octaves in subsection b¹, the ordered set of pcs is <A, D, F, B \flat , D, G>. This ordering includes, in concatenated form, the third, second, and first 3-11 pc-sets of the 8-23 referential pc-collection given in Figure 6a—in that very order. Note that in unordered set theory the second pc D would be eliminated and the ordered succession of "melodic" 3-11 pc-sets would be lost.

Another important "melodic" phenomenon is the ordered-interval set of <1,2,2> with its retrograde <-2,2,-1>, its inversion <-1,-2,-2>, its retrograde inversion <-2,-2,-1>, and concatenations of these.¹⁸ Figure 6c, a canonical form of 8-23's home pc-collection, is, in fact, one of those concatenations. This very concatenation is the principal organizing force of the upper voice in part A. In subsection a¹ and a², bars 1-6, the pitches B \flat ₅ to E₅ imply <-1,-2,-2,-1>, which is the top part of a great concatenation of this "scalar" motive. After the repetition of subsection a³, bars 15-19, the E₅ is regained on the second beat of bar 22 where it creates the ordered interval succession <-2,-2,-1>. This completes several concatenations, <-1,-2,-2,-1,-2,-2,-1>, which also completes the canonical form of 8-23 at the referential pc level <B \flat ₅, A₅, G₅, F₅, E₅, D₅, C₅, B₄>. Part A closes thereafter with the end-of-part signal in bars 28 and 29. Bars 20 through 22 are rich in this motive or fragments of it which are then subordinate to the great concatenation. The bass imitates the upper voice's "scalar" motive from the second beat of bar 22 through bar 27. Note also the registral design of subsections b¹, b² and c¹¹ which avoid the register inhabited by the great concatenation.¹⁹

¹⁸ These are ordered intervallic distances measured in equal-tempered semitones. "+" indicates up in musical space, and "-" indicates down in musical space. An inversion is the reversal of signs, "+" for "-" and "-" for "+". Retrograde is a reversal of the ordering; retrograde inversion is the reversal of both signs and ordering.

¹⁹ Note that the "melodic" intervallic ordering in musical space <+1,+2,+2> or its inversion, <-1,-2,-2>, will produce a member of set-class 4-11, [0,1,3,5], which is neither of the two orderings van den Toorn cites as melodic ordering stylisms in Stravinsky's music: 4-3, [0,1,3,4] and 4-10 [0,2,3,5]. See van den Toorn, pp. 60-66.

As previously mentioned, the "harmonic" set-class 3-4, [0,1,6], has an end-of-subsection role. The bass of bars 20 to 28 is dominated by an ordered "melodic" instance of set-class 3-5, $\langle C\sharp^2, F\sharp^2, G^2 \rangle$ which is repeated. When the repetition ends, its last pitch, G² at bar 28, coincides with the start of the end-of-part signal and so provides a pitch structure that skillfully links subsections c¹ through e¹.²⁰ I call this the "melodic 3-5" motive.

For the last "melodic" structure I will point out here, recall the left hand's initial pc-set 3-1 of bar 1 which separated the 6-Z40 from a diatonic interpretation. Its ordered intervals are $\langle 1,1 \rangle$ which I informally call the "chromatic" motive. Note that it returns in an inverted form linking the two gestures comprising e¹, the end-of-part signal of bars 28 and 29. The pitches involved include the D^{#5} which creates the end-of-part's referential set-class 8-Z15 at its "cadential" pitch level, and the F⁵ and E⁵, which are the centers of symmetry for the great concatenation of "scalar" motives. See the bass and tenor voices at the second beat of bar 63 through the first beat of bar 65 for a striking instance of the "chromatic" motive at a moment in the piece where we have both "foreign" set-classes and pcs. Two more interesting cases are found in the first three notes of the upper voice in bar 43 an r₁ rotation, which is spelled out in the large in the upper voice starting on the third beat of bar 51 and extends through the first beats of bars 52 and 53. It links subsection e², end-of-part B signal, to the opening of part C.

I have mentioned seven forces operating on several layers which contribute to the sense of closure for part A: 1) the return to the referential pc-collection; 2) the return of an emphasized set-class (3-11); 3) the return of the "chromatic" motive; 4) the ending of the great upper voice concatenation; 5) the completion of the "melodic 3-5" motive; 6) the use of the specially reserved trilling gesture; and 7) the return of the pc D[#] which with the pc F[#] yields the set-class 8-Z15 in the previously mentioned R_o and R_p relations with the referential set-class, 8-23 at their "home" pc levels. Finally, I have pointed out several instances where canonical forms of the referential set-class, made possible by its inversional symmetry, are realized.

²⁰ See, Rahr, pp. 134-135 on the order operations of rotation and retrograde and their combination.

These symmetrical realizations were shown to subtly control many aspects of the movement's design and there is one last important instance found at the movement's end that I shall point out. After the end-of-part signal in bars 78 and 79, an end-of-movement signal is needed. In bar 80 the pc-collection (G, A, B, D, E), an instance of set-class 5-35, is a prominent pc-subset and one which is included within the referential set-class at its "home" pc level. If pc D \sharp is substituted for pc D, the resulting pc-set, 5-30 is formed. This very pc-set is held invariant throughout all three of the end-of-part signals. As shown by Figure 5, set-classes 5-30 and 5-35 are in the same R_o and R_p relations shared by set-classes 8-23 and 8-Z15. Therefore, they can have maximum pcs in common, as is the case here, and they possess maximum interval-class dissimilarity—again, perfect for differentiation of function without sacrificing coherence. The end-of-movement signal of bar 80 "liquidates" that significant D \sharp which differentiates the referential pc-collection versions of 8-Z15 from that of 8-23 as it is no longer needed. Thus, with the sole exception of the pitch D3, that instance of set-class 5-35, the spatially ordered set of pitches (A4, E4, A3, D3, B2, G2, D3, A2), symmetrically approaches bar 81's ending pitch-set (A4, A3, A2, A1) by contrary motion. While much more could be said about the movement, I shall now turn to the larger issues mentioned above.

III

In order to explain a tantalizing repertoire, "neo-Schenkerians" have appropriated notational devices from Schenker's work while not always shearing away, through rigorous redefinition of the symbols and their accompanying ideas, all of the theoretical assumptions the devices imply. These notations have been used in conjunction with the extremely general and, hence, quite powerful ideas of unordered pc-set theory. Due to the musical sensitivity shown by these analysts and the suggestive power of a more linear approach, some significant features of these works have been recovered that would otherwise have been missed via a straight unordered set-theory approach. The metaphor of motion-in-time, implied by the phrase "the arrow-of-time," is again addressed by these analysts through their view of this repertoire as being "tonally" directed. They have sought to understand, through appeals to im-

bedded parallelisms at several levels of structure, why set-classes have certain pitch-successions and not other possible ones. These questions are vital to the understanding of individual pieces and towards developing a knowledge of a composer's stylisms.

Unfortunately, allusions to "voice-leading" and some kinds of "parallelisms" found in tonality are dependant on the analyst's correct interpretation in tonal pieces of the intertwined concepts of meter, harmony, counterpoint, diminution, and, most importantly, consonance and dissonance. Only in the realm of a "harmony"—based on the work of Alphonse, Babbitt, Forte, Lewin, Martino, Morris, Perle, Rahn, Starr, and others—do we have a start on the definitions needed to support these constructs for use in the neo-tonal repertoire. At best only a claim for a limited "part-writing" of "harmonies" can be supported at this moment in time.

On the other hand, Straus expertly points out that: "...the pre-serial music of Stravinsky actually makes use of organizational principles which are not at all far removed from the principles of serial composition."²¹ I have shown six areas in which principles from serial thought and other viewpoints can be of invaluable assistance to the analyst. First, by employing the two ways of viewing pc, pitch, and set-class structure in neo-tonality, we note motion to and from a "home" pc-collection involving the triggering mechanism of literal complementation and the motion from super and subsets of a referential set-class to those not included and back. Second, by investigating the inversionally symmetrical nature of referential set-classes, we receive clues as to what structures are available and might be important for associative patterning. Third, by exploring ordered sets of pcs and pitches (including multiple members of the same pc) in time and space we uncover, in conjunction with points two and four, why some outer voice configurations and lines of pitches occur. Fourth, by emphasizing the relations between entities as series of operations or transformations, we can understand the various means of motion and why some of the pc-sets are grouped as they are. In particular, inversion about dif-

²¹ Joseph N. Straus, "A Principle of Voice-Leading in the Music of Stravinsky," *Music Theory Spectrum* 4 (1982) 117. Straus has also spoken on the problems of adapting Schenker's ideas to the "neo-tonal" repertoire: "The Problem of Prolongation in Post-Tonal Music," *Journal of Music Theory*, 31/1 (Spring, 1987) 1-22.

ferent pc pairs, is quite useful in making these relationships clearer for discovery. Fifth, by using contextually defined notions of "cadence" in conjunction with our other pairs enables us to place within a "formal" framework patterns created by operations and transformations. Last, redesigning graphic displays of set-complex relations, in light of a referential set-class's super and subset structure and set-similarity relations, assists in visually making clearer the roles of infrequently occurring, "unconnected" and "foreign" set-classes as providing structural contrast.

As for uncovering stylisms, contextual interpretations of analytical results for these six areas are disappointing. Even before I began preparing statistical counts of various kinds and their accompanying a priori probabilities, I discovered that the roles of the various set-classes changed from part A to part B to part C in much the same way as we saw the role of set-class 3-11 change within part A. As for the referential pc-collection, referential set-class and means of motion, even the second movement, the "Romanza," replaces these ways of being with others. Thus, at this point in time, I am skeptical that we can hope to adequately describe and explain a significant number of inter-movement stylisms (much less inter-opus ones) through empirically derived rules.

We need a general theory that can more fully account for drastic changes of surface pitch relations than we now possess. Until we have such a theory, theoretical and analytical techniques recalled by this paper can help focus discussion on more meaningful interpretation of neo-tonal music rather than on unacknowledged and undefined theoretical statements inferable from neo-Schenkerian analyses. In the meantime, even though we will be unable to claim absolute truth for all our results, sophisticated interpretations can address significant aspects of the neo-tonal work's flow-in-time using well defined concepts from set-theory.

Appendix

I. Prominent analysts who have utilized a comparatively straightforward application of Schenker's method to the work of Stravinsky include:

- Allen Forte, *Contemporary Tone Structures* (New York: Bureau of Publications, Teacher's College, Columbia University, 1955).
- Adele Katz, *A Challenge to Musical Tradition* (London: Putnam, 1947; reprint, New York: Da Capo, 1979).
- Felix Salzer, *Structural Hearing* (New York: Charles Boni, 1952; reprint, New York: Dover, 1962).
- Heinrich Schenker, *Das Meisterwerk in der Musik*, (Munich: Drei Masken Verlag, 1926) vol. 2, 37-40. This excerpt is translated in: Sylvan Kalib, *Thirteen Essays from the three Yearbooks Das Meisterwerk in der Musik by Heinrich Schenker: An Annotated Translation* (Ann Arbor, Mich.: University Microfilms International, 1973) 76-91.
- Roy Travis, "Towards a New Concept of Tonality," *Journal of Music Theory* 3/2 (Nov., 1959) 257-84.

II. Prominent analysts who have utilized set-theory and/or serial procedures in understanding Stravinsky's work include:

- Milton Babbitt, "Remarks on Recent Stravinsky," *Perspectives on Schoenberg and Stravinsky*, revised ed., Benjamin Boretz and Edward T. Cone, eds. (New York: W.W.Norton, 1972) 123-54.
- Martin Boykan, "Neoclassicism and Late Stravinsky," *Perspectives of New Music* 1 (Spring, 1963) 155-69.
- Thomas Clifton, "Types of Symmetrical Relations in Stravinsky's *A Sermon, A Narrative, and A Prayer*," *Perspectives of New Music* 9/1 (Fall, 1970) 96-112.
- Allen Forte, *The Harmonic Organization of the Rite of Spring* (New Haven: Yale University Press, 1978).
- George Perle, *Serial Composition and Atonality*, 5th ed. (Berkeley: University of California Press, 1981).

Henri Pousseur, "Stravinsky by Way of Webern: the Consistency of a Syntax," *Perspectives of New Music* 10/2 (Spring-Summer, 1972) 13-59 and 11/1 (Fall-Winter, 1972) 112-45.

Claudio Spies, "Notes on Stravinsky's *Abraham and Isaac*," and "Notes on Stravinsky's Variations," *Perspectives on Schoenberg and Stravinsky*, revised ed., Benjamin Boretz and Edward T. Cone, eds. (New York: W.W.Norton, 1972) 186-209, 210-49.

—, "Some Notes on Stravinsky's Requiem Settings," *Perspectives of New Music* 5/2 (Spring-Summer, 1967) 98-123.

III. For other significant views on Stravinsky's music see:

Thomas Clifton, *Music as Heard: A Study in Applied Phenomenology* (New Haven: Yale University Press, 1983).

Robert Cogan, "Le Sacre du Printemps, 'Introduction', a Sound Spectrum Photo," *Sonus* 2/2 (Spring, 1982) 1-3.

—, "Stravinsky's Sound, a Phonological View: Stravinsky the Progressive," *Sonus* 2/2 (Spring 1982) 4-25.

—, *New Images of Musical Sounds* (Cambridge Mass.: Harvard University Press, 1984).

—, "Toward a Theory of Timbre and Musical Line in Purcell, Sessions, and Stravinsky," *Perspectives of New Music* 8/1 (Fall-Winter, 1969) 75-81.

—, and Pozzi Escot, *Sonic Design: the Nature of Sound and Music* (Englewood Cliffs, N.J.; Prentice-Hall, 1976).

Edward T. Cone, "Progress of a Method," *Perspectives on Schoenberg and Stravinsky*, revised ed., Benjamin Boretz and Edward T. Cone eds., (New York: W.W.Norton, 1972) 155-64.

—, "The Uses of Convention: Stravinsky and His Models," *Stravinsky, a New Appraisal of His Work*, ed. Paul Henry Lang (New York: W.W.Norton, 1963) 21-33.

IV. Another, newer branch of Stravinsky scholarship looks at issues of surface and subsurface parsing of his score:

~~Christopher S. Hayes~~, "~~On the Problem of~~ Succession and Continuity in Twentieth-Century Music," *Music Theory Spectrum*, 8 (1986) 58-74.

Marianne Kielian-Gilbert, "The Rhythms of Form: Correspondence and Analogy in Stravinsky's Designs," *Music Theory Spectrum*, 9 (1987) 42-66.

Jonathan D. Kramer, "Moment Form in Twentieth-Century Music," *Musical Quarterly*, 64/2 (April 1978) 177-94.

Pieter C. van den Toorn, "Stravinsky Re-Barred," *Music Analysis*, 7/2 (July 1988) 165-95.

Erratum

The following figure should be substituted for Figure 5 on page 38 of Richard Hermann's article in Volume 12 (1987).

Figure 5

