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The Roots of Form in Schoenberg's "Sketches"

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THE ROOTS OF FORM IN

SCHOENBERG'S SKETCHES

Martha MacLean Hyde

Descriptive titles seem preferable on the whole, but I was tempted to call this paper "Schoenberg Is Alive" because my principal aim will be to reverse the conclusions advanced by Pierre Boulez under the title "Schoenberg Is Dead." Boulez published his premature obituary for Schoenberg's influence in 1952, but its arguments still merit consideration for two reasons. First, it remains the most forceful and concise expression of difficulties that Boulez found in Schoenberg's method—one he has never retracted, but rather reiterated and extended in later works.¹ Second and more important, Boulez's criticisms, though severely challenging Schoenberg's achievement, have been neglected by all but a very few scholars.² Schoenberg's influence will obviously not live or die on scholarly command, but Boulez's criticism, and I hope my reply, are valuable because they help us better to understand the resources of Schoenberg's method and the achievement of his music.

Of the two major apparent difficulties in Schoenberg's twelve-tone method, what might be called "the harmonic problem" and "the form problem," Boulez concentrates on the latter—the potential of the method to sustain extended forms comparable to those of tonal compositions. Against the common view that Schoenberg went too far in trusting to a method that lacks structural principles comparable to

those of tonal harmony,³ Boulez, the second-generation avant-gardist, asserts that Schoenberg did not go far enough. In Boulez's view, Schoenberg failed to explore the potential of the twelve-tone method to generate its own forms.

This explains a certain weakness in most of [Schoenberg's] twelve-tone works. The pre-classical and classical forms ruling most of his compositions were in no way historically connected with the twelve-tone discovery; the result is that a contradiction arises between the forms dictated by tonality and a language [the twelve-tone method] of which the laws of organization are still only dimly perceived. It is not only that this language finds no sanction in the forms used by Schoenberg, but something more negative: namely, that these forms rule out every possibility of organization implicit in the new material.⁴

Boulez complains further of Schoenberg's use of "clichés typical of a romanticism at once ostentatious and outmoded," in particular accompanied melody, counterpoint based on principal and subsidiary voices (*Hauptstimme* and *Nebenstimme*), rhythmic structure based on strong and weak beats, false appoggiaturas, broken chords, and repetitions. These complaints lead to the conclusion that Schoenberg's twelve-tone music did not escape the basic principles of the tonal language, as Schoenberg always claimed, because it maintained melody, harmony, and counterpoint as separate functions.⁵

Whether, in the common view, from going too far or, in Boulez's view, from not going far enough, it is clear that Schoenberg's method is at least gravely ill by his own standards unless one can show that the forms and phrases he employs, though they may seem pre-classical or classical, are not tonal clichés, and do not rule out the possibilities of organization implicit in twelve-tone composition, but rather fulfill them. That is what this paper attempts to do with the help of Schoenberg's manuscript sketches. In this initial study, I will have to concentrate on Schoenberg's techniques for structuring phrases, the smallest formal units of his compositions, and his techniques for motivic variation and development. Far from incorporating tonal clichés, these techniques provide the means by which Schoenberg was able to build up extended forms using twelve-tone procedures alone.

It may be helpful first, however, to see what claims Schoenberg himself made for the formal resources of the twelve-tone method. They hardly bear out Boulez's contention that even "though Schoenberg's work is essentially experimental, it lacks ambition."⁶ Statements in Schoenberg's publications throughout the 1920's and 30's show that he was ambitious precisely where Boulez would find him timid—in developing the twelve-tone method's potential for extended forms:

It is evident that abandoning tonality can be contemplated only if other satisfactory means for coherence and articulation present themselves.

From the very beginning, this was clear in my mind: tonality's aids to articulation having dropped out, one must find some substitute, so that longer forms can once more be constructed.⁷

Implicit in these sentences is Schoenberg's confidence that his method did provide its own means for coherence and articulation—satisfactory substitutes for tonal techniques—but other statements make this claim explicit. In "Composition With Twelve Tones," his manifesto first presented in 1934 and published in 1950, he proclaims success:

After many unsuccessful attempts during a period of approximately twelve years, I laid the foundations for a new procedure in musical construction which seemed fitted to replace those structural differentiations provided formerly by tonal harmonies.⁸

Toward the end of his life, the claim became even stronger, the success less ambiguous:

Forty years have since proved that the psychological basis of all these changes was correct. Music without a constant reference to a tonic was comprehensible. . . .⁹

In most of these statements, Schoenberg was responding to scepticism about his method that would receive something like definitive form in Boulez's article. But his declarations rarely satisfied his critics, either then or now. When pressed further by those he sometimes called his "inquisitive tormentors," he tended to become mystical, or to resort to vague analogies with tonal music, or to impugn the imagination and intelligence of his critics:

Who can say today how a principal subject must be built up. What one must do that it may hold together? . . . Who can say how a fluid form is solidified, how an introduction or a development must be evolved? He who can do these things and knows will not be in doubt as to whether or not tonality must be restored to achieve form.¹⁰

Schoenberg maintained this Buddha-like reticence about his techniques for building up extended forms, but the claim that those who say don't know and those who know don't say hardly silenced the talkers. The manuscript sketches show clearly that Schoenberg preferred to suffer his inquisitive tormentors in enigmatic silence rather than join in the chatter by divulging the techniques he had worked out for achieving form. When he did respond, he was evasive, if not quite misleading, as the sketches show. They are therefore crucially important in under-

standing Schoenberg's system, for they make clear what he kept hidden—how an extended form can be derived from a single twelve-tone row.

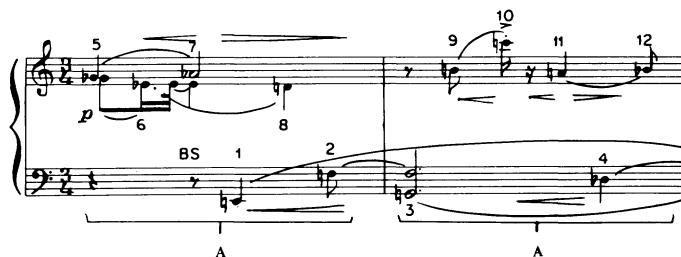
I need to begin by reviewing some principles of twelve-tone harmonic structure which I have discussed elsewhere, because harmonic structure is the foundation upon which Schoenberg builds extended form.¹¹ It will be convenient and appropriate to use examples from Schoenberg's lecture "Composition With Twelve Tones," for it represents his only manifesto, and its examples, with the corresponding sketches, illustrate the fundamental principles of twelve-tone harmony.

Part way through an early version of "Composition With Twelve Tones," Schoenberg advances an ambiguous redefinition of what constitutes a harmony under his new method:

I . . . arrived at the concept whereby the vertical and horizontal, harmonic and melodic, the simultaneous and the successive were all in reality comprised within one unified space. It followed from this that whatever occurs at one point in the space, occurs not only there but in every dimensional aspect of the spatial continuum, so that any particular melodic motion . . . will not only have its effect upon the harmony, but on *everything* subsequent that is comprised within that spatial continuum.¹²

Schoenberg, then, does not conceive of a harmony as merely a vertical event with pitches sounding simultaneously, but asserts that melodic events also have harmonic implications. He proposes that a legitimate harmony comprises all pitches, either simultaneous or successive, which are temporarily associated or, as he describes it, "comprised within the same spatial continuum."

One of the examples cited in "Composition With Twelve Tones" will clarify Schoenberg's rather obscure concept of "multi-dimensional musical space" and show precisely its importance for harmonic structure, and also for form. This example (Example 1) contains the opening phrase of the Minuet from the Piano Suite, Op. 25. Schoenberg points out that the basic set, which is partitioned into three tetrachords, is presented in an irregular fashion: "The melody begins with the fifth tone, while the accompaniment, much later, begins with the first tone."¹³ (In this and the following examples, the pitches are labelled by order numbers 1 through 12.) Schoenberg gives two reasons to justify this irregular presentation: first, the Minuet represents the fifth movement of the Suite so that the basic set has become sufficiently familiar, and second, each tetrachord maintains the correct ordering of its pitches and consequently each tetrachord can function as an independent small set. But Schoenberg stops short of explaining what criteria control *how* these tetrachords are used independently. Analysis of the harmonic structure of this example reveals some of his criteria,



A
A

Basic Set: $\overbrace{E \ F \ G \ D\text{-flat} \ G\text{-flat} \ E\text{-flat}}^A \ \overbrace{A\text{-flat} \ D \ B \ C \ A \ B\text{-flat}}^A$

Example 1. Suite, Op. 25, Minuet

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for it exposes two connected dimensions. The first, which can be termed the “primary dimension,” includes the entire phrase and simply reproduces the twelve successive pitches of the basic set. That is, the “primary harmonic dimension” contains contiguous elements of the basic set and occurs with each of its ordered statements. The second, the “secondary dimension,” spans each individual measure and represents two hexachordal harmonies (marked A) which contain pitches that are non-adjacent in the basic set, but which are equivalent to its principal hexachord. “Equivalent” here means that they are not identical, but rather are unordered and related by transposition or inversion or both. In other words, measure 1 unfolds a hexachord containing pitches with the non-successive order numbers 1, 2, 5, 6, 7, and 8, but this harmony is equivalent to (in fact, is an inverted transposition of) the pitches with the successive order numbers 1, 2, 3, 4, 5, and 6. Similarly, the second measure unfolds a hexachord containing pitches non-adjacent in the row, but again equivalent to the principal hexachord of the basic set. Notice that while the hexachords in both measures are equivalent to the principal hexachord of the basic set, the ordering of their respective pitches differs from those in the basic set. Thus, even though this secondary harmonic dimension contains hexachords which are inversions or transpositions (or both) of the principal hexachord of the basic set, they are not presented by the *same* succession of intervals.¹⁴

This simple example shows how Schoenberg could legitimately assert that a single twelve-tone row can integrate all harmonic and melodic dimensions of a composition, and also shows the rudimentary techniques implied by that assertion. Scholars and composers have misunderstood, however, and would assert that because pitches adjacent in the example are not adjacent in the row, Schoenberg has had to impose an arbitrary harmonic structure on his theme in order to generate a complete musical texture, since the row itself was insufficient to generate one.¹⁵ Boulez does not mention this example in “Schoenberg Is Dead,” but it is easy to infer his position from other arguments and examples.¹⁶ No doubt he would complain that Schoenberg’s attempt to combine the twelve-tone method with the tonal form of the minuet involved him in arbitrary and contradictory restrictions. The accented downbeats and two-bar phrases required in a minuet, Boulez would argue, block a rhythmic and harmonic structure uniquely serial. But, as this example shows, Schoenberg’s two simultaneous dimensions of harmonic structure clearly delineate a two-bar phrase subdivided into two measures of equal length. The minuet form is thus not a tonal convention arbitrarily imposed, but rather is re-created through twelve-tone techniques alone.

Example 1 is worth a moment more, because it conveniently demonstrates three principles of Schoenberg’s method for organizing

harmonic structure. First, twelve-tone harmonies need not be simultaneous, that is, they need not occur only in the vertical dimension. In Schoenberg's idea of "two-or-more-dimensional space" no categorical distinction exists between the vertical and the horizontal. Consequently, he no longer defines harmonies as vertical simultaneities, but rather as pitches occupying the same "spatial continuum." This concept allows Schoenberg in Example 1 to regard the hexachord unfolded in each measure as an harmonic entity, even though its elements unfold successively.

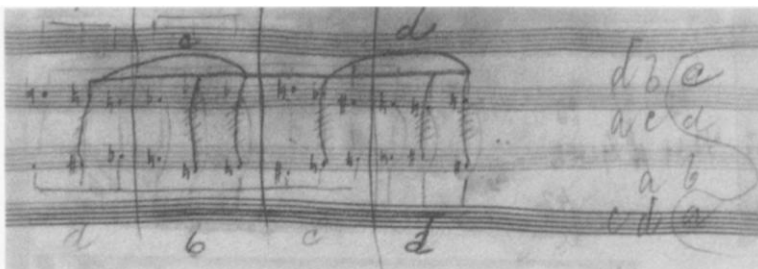
Second, a single harmonic event necessarily affects *more* than one dimension. In Example 1, for instance, each pitch functions simultaneously in two different harmonic dimensions. This principle is confirmed by statements in "Composition With Twelve Tones."

Any particular melodic motion—for instance, a chromatic step—will not only have its effect upon the harmony, but on everything subsequent that is comprised within that spatial continuum. . . . This circumstance . . . enables the composer to assign one part of his thinking to . . . the vertical, and another in the horizontal.¹⁷

Because, in Schoenberg's view, musical ideas necessarily affect both vertical and horizontal dimensions, a composer must structure both simultaneously; he cannot merely attend to the unfolding of the row.

Third, and most important, the order of the twelve pitch-classes defines the harmonies of the basic set, but it defines them primarily by intervallic content rather than by pitch-class content. In Example 1, for instance, the harmonies marked *A* in the composition contain entirely different pitches from those marked *A* in the basic set, but have identical total intervallic content. Moreover, these harmonies need not be presented by the same succession of intervals, that is, the internal ordering of their pitches need not be the same. Notice that the harmonies marked *A* are, in fact, stated by entirely different intervallic patterns; consequently the ordering of their respective pitches is not identical. But because they all are related by transposition or inversion or both, their total intervallic content is the same.

This view of how the basic set generates harmonic structures in several dimensions is confirmed repeatedly by Schoenberg's compositional sketches. One of them, a sketch for the String Quartet No. 4, Op. 37, given in Example 2, shows him working out a harmonic structure similar to that of Example 1.¹⁸ In this sketch he searches for a pair of complementary hexachords comprised of pitches non-adjacent in the row but still equivalent to the principal hexachord of the basic set. He has written two combinatorially related row forms which I have labelled P_0 and I_5 . Schoenberg has stemmed the pitches of the first and third trichords of I_5 and connected them with a beam, and done likewise



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(transcription)

c d

[P₀]

[I₅]

d b c
a c d
a b
c d a

d b c a

Example 2. Sketch for String Quartet No. 4, Op. 37 (#1031)

with the pitches of the second and fourth trichords. This procedure divides the row into two complementary hexachords, each containing non-adjacent pitches in the row. (Notice that the vertical lines between the row forms indicate the pitches occupying similar positions in both row forms.) Schoenberg has also considered a second pair of complementary hexachords which he indicated with beams above P. The first beam connects non-adjacent pitches with order numbers 1, 3, 4, 7, 9, and 10; the second beam connects pitches with the remaining order numbers 2, 5, 6, 8, 11, and 12. Schoenberg apparently decided, however, that this second pair of hexachords was unsatisfactory and crossed out the hexachord indicated by the second beam above P. What was wrong with this pair of hexachords? If one examines the structure of both pairs of hexachords, one discovers that only the pair marked below I_5 is equivalent to linear segments of the row. In fact, they represent transpositions or inversions (or both) of the principal hexachord. Probably as an aid to memory, Schoenberg summarized his findings in the table to the right of the sketch. Notice that below I_5 he has labelled the trichords with the letters d, b, c, and a, and then tabulated all the possible pairings of trichords, using a vertical line to mark the four trichord pairs (db, ac, ab, and ca) which represent either the principal hexachords or equivalent forms of the principal hexachords.¹⁹

The method shown in Example 2 works throughout the Fourth Quartet to generate harmonic structure, but it also provides a foundation for the larger-scale structures that are the topic of this essay. In Example 3 the same method—use of hexachords equivalent to the principal hexachords of the row—can be seen structuring the opening theme of the first movement. The theme consists of a melody presented by the first violin with an accompaniment by the remaining three instruments. The melody contains one complete statement of the basic set partitioned into four trichords, which I have marked a, b, c, and d. The other instruments accompany each trichord of the melody with three chords representing the three remaining trichords of the row. The phrase thus contains four complete statements of the same row form, and each accompanying chord, taken with the melodic trichord, forms a hexachord that is either a linear segment of the row or equivalent to one. Upper case letters show the succession of hexachords in the phrase and their equivalent forms in the basic set. Like Example 1, Example 3 displays two harmonic dimensions derived from the basic set. The primary dimension simply represents four complete statements of the row, while the secondary dimension binds together the melody and accompaniment by hexachords either identical or equivalent to linear segments of the row. If we neglect Schoenberg's redefinition of harmonies by their intervallic content rather than pitch content, we will

Allegro molto, energico

ff

b c

A A B B A A A A A B

d

N

sf

sf

B A A

Basic Set: $\overset{A}{D} \ C\text{-sharp} \ A \ \overset{A}{B\text{-flat}} \ F \ E\text{-flat} \ \overset{A}{E} \ C \ A\text{-flat} \ \overset{A}{G} \ F\text{-sharp} \ B \dots$

Example 3. String Quartet No. 4, Op. 37, mm. 1-6

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be mystified here by his claim to derive all harmonic dimensions from a single basic set.²⁰

Examples 1 and 3 show Schoenberg associating non-adjacent pitches of the basic set to create equivalent forms of the principal hexachord and using these hexachords to connect several harmonic dimensions within a single row form. Perhaps more often, this same technique binds together several different row forms, creating a harmonic dimension that determines the length of an individual phrase. Consider, for example, a phrase from the Suite, Op. 29, (Ex. 4), which contains four combinatorially related row forms, labelled P_9 , I_2 , I_4 , and P_{11} . Schoenberg's designation of the principal voices by the signs "H" and "N," divides the phrase into these two melodic voices and an accompaniment. If we examine the harmonic structure of these voices, each of which contain pitches extracted from four different row forms, we discover that Schoenberg repeatedly uses forms of the principal hexachord to connect the four row forms into a single phrase. The voice marked "H" unfolds two occurrences of the principal hexachord (marked "A") each containing pitches from two different row forms. Moreover, the entire voice of fourteen pitches contains only six different pitch-classes and thus unfolds only *one* form of this hexachord. The voice marked "N" unfolds nine pitches but contains only six pitch-classes, which make one occurrence of the principal hexachord. (Notice that the hexachord is completed only with the entrance of the final pitch, B flat.) Because it spans all four row forms, this voice defines the length of the phrase and also binds it into an indivisible unit. The principal hexachord of the basic set lends itself well to this kind of phrase structure, for it is all-combinatorial and has only four distinct forms. Example 4 clearly shows, then, how intervallic properties of the basic set can generate discrete phrases. It now is possible to understand more clearly why Schoenberg has included markings designating the principal voices. It is not merely to arbitrarily create a familiar tonal texture of theme and accompaniment, but rather to indicate those voices unfolding discrete secondary harmonic dimensions which define and unify individual phrases. It is important to note that these secondary dimensions are derived from twelve-tone procedures alone and are not in any sense dependent upon tonal procedures.²¹

One common view of Schoenberg's techniques for structuring phrases has been analogous to the standard criticism of his harmonic structure: the row itself judged to be incapable of generating harmonic textures or extended forms, followed by the conclusion that Schoenberg has had to impose an arbitrary order, one not derived from the row. Phrases, in this view, are delineated by changes in textural, rhythmic, or dynamic patterns.²² These surface features do, of course, mark phrases in Schoenberg's twelve-tone music, but they do not account for

P₉ I₂ I₄ P₁₁

Basic Set: A D-flat C E A-flat F ^A F-sharp E-flat D B-flat B G

Example 4. Suite, Op. 29, Overture, mm. 105-108

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Example 5. Wind Quintet, Op. 26, Andante

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the shape these phrases take, that is, they do not explain what determines the unity of these phrases. This common view is as superficial as an account of sentence structure that attended only to commas and periods. A second, more fruitful, approach emphasizes the use of invariants and the combinatorial property to provide continuation and association.²³ Even this approach is less than complete for it often fails to explain what determines the shape and unity of discrete phrases. In Example 4, for instance, the combinatorial property explains why these four row forms are associated, but not why *only* four row forms appear. Moreover, while invariants insure smooth continuation between the four row forms, they again do not account for the unity of the phrase. In this example, the unity of the phrase is determined by the violin line whose derivation is not directly dependent on either the combinatorial property or invariants.

An additional example from "Composition With Twelve Tones" exhibits a second important method for building individual phrases. In the lecture Schoenberg uses the opening theme of the third movement of the Wind Quintet, Op. 26, which appears in Example 5, to demonstrate what he calls a more "complicated procedure for constructing themes." Within the theme, he says, there is a definite regularity in the distribution of tones, but he stops there, shrinking from an explanation that he says in an early version of the lecture would be too complex.²⁴ Example 5 is indeed complex, and I will point out only one of its more interesting features. The example consists of three repetitions of a single row form; thus, its primary dimension of harmonic structure is simply the ordered presentation of the row. A secondary dimension of harmonic structure unfolds in the upper voice, played by the horn. Notice that the successive pitches in this voice are mostly non-adjacent in the basic set. But in fact this upper voice consists of exactly the twelve pitches of the row and spans all three row forms. Even though the upper voice does not follow the order of the row, it does contain all of its pitches and consequently has the same total intervallic content. It is this secondary dimension of harmonic structure which joins the three repetitions of the basic set into a single phrase, and which Schoenberg referred to as a "more complicated procedure for constructing themes."²⁵

The desire to systematize further this procedure for building phrases led Schoenberg to some of his most experimental compositions, including the String Quartet No. 3, Op. 30, and the String Trio, Op. 45. In the Third String Quartet, for example, he uses not one, but three different forms of the basic set, even though in "Composition With Twelve Tones" he explicitly rejects using more than one. His row tables for the Third Quartet, partially reproduced in Example 6, show that in all three forms of the basic set, the first five pitches occur in the same order,

Example 6. Sketch for String Quartet No. 3, Op. 30 (#1002)

The image displays a musical score sketch for a string quartet, consisting of five staves labeled M1, M2, M3, M4, and M5. The notation is written in a sketchy, handwritten style. Each staff contains a series of notes, primarily eighth and sixteenth notes, with some rests. Dynamic markings such as 'f' (forte) and 'p' (piano) are interspersed throughout the score. The staves are arranged vertically, with M1 at the top and M5 at the bottom. The overall impression is that of a preliminary draft or sketch for a composition.

while the last seven pitches occur in three different orders. Schoenberg labels the principal ending as " $M_1 N_1$ " (*Mittelsatz₁ Nachsatz₁*) and the two variants as " $M_2 N_2$ " and " $M_3 N_3$."²⁶ We can discover why Schoenberg has ignored his own principle that a composition have only one basic set if we analyze how he uses the three sets to design multi-dimensional harmonic structures. One particularly ingenious structure integrates the second principal theme of the first movement. Example 7 shows the theme as it appears in what we might loosely call the beginning of the Recapitulation. It consists of six different row permutations (P_1 , RI_{10} , P_{11} , I_0 , I_4 , RP_1) which employ all three alternative orderings. The first permutation, P_1 , for example, uses the third ending which I have indicated by the (3) following the row label; the second permutation, RI_{10} , uses the first ending, indicated by the (1); and so forth. Schoenberg uses these alternative endings to construct a melody that spans and integrates the entire phrase. This melody, presented by the cello, uses two pitches from each row form and unfolds an ordered permutation of the principal basic set, labelled P_7 . The two pitches from each row form played by the cello always represent order numbers 6 and 7, or 11 and 12 in the row they come from. Schoenberg has used only pitches with these order numbers in order to partition each row form into two five-note segments and one two-note segment, a partition which characterizes and dominates the entire movement. The alternative endings are thus required if the necessary intervals are to appear at these two points in the row. In contrast to Example 5, the harmonic dimension that forms the phrase not only duplicates the intervallic content of the basic set (as of course it must), but also maintains its exact succession of intervals.

This example also displays the third, and perhaps most important of Schoenberg's techniques for building individual phrases. Within the accompanying voices he binds together successive row forms by constructing harmonies equivalent to linear segments of the basic set. These segments, however, are not limited to the principal hexachord, or the universal set, but occur in various sizes. The first violin, for example, unfolds a two-bar harmony (marked *A*) which spans the first two row forms and is equivalent to the final seven-note segment of the principal basic set ($M_1 N_1$). The second violin likewise unfolds a two-bar harmony which spans the first two row forms (marked "*B*") and is equivalent to the nine-note segment marked *B* on the principal basic set. A similar structure binds the next two row forms together with two different forms of the same eight-note harmony, marked *C*, which are equivalent to the linear segment marked *C* on the principal basic set. The final two row forms are connected in the same way by two harmonies equivalent to the first seven-note segment of the principal basic set, marked *D*. Notice that because none of these equivalent

harmonies have the same succession of intervals as the basic set, they relate to the basic set primarily through total intervallic content.²⁷

Example 7 shows Schoenberg carefully associating various orderings of the basic set in order to build a complex but unitary phrase. This phrase depends upon large harmonies, containing seven, eight, or nine pitches; earlier examples depended upon harmonies of six or twelve pitches. In general Schoenberg seems willing to use harmonies of any size from the basic set to connect the multiple dimensions of harmonic structure, though he perhaps tends to prefer smaller ones. Consider, for example, the opening theme for the first movement again of the Third Quartet shown in Example 8a. It consists of two repetitions of the row form P_7 , which uses the first and second alternate orderings of the basic set, respectively. The entire line presented by the first violin unfolds pitches contained in the final seven-note segment of the basic set, and the second violin and viola present the first five-note segment of the basic set. Of special interest is the four-note harmony presented by the cello which spans the entire theme and consists of the sixth and seventh pitches of both alternative forms of the row. Notice that even though these pitches are not adjacent in either form, they nevertheless are equivalent to the harmony marked *C* on the basic set. A brief sketch for this theme, shown in Example 8b, shows Schoenberg marking with brackets and bar lines this important harmonic relation. This sketch leaves little doubt that he regards these four pitches as a single harmony, and their prominent position in the opening theme reflects their special importance.

These last two examples are particularly interesting for they show that Schoenberg is willing to modify one of the principal tenets of his system, that a composition should have only one basic set, in order to produce harmonically integrated phrases. These phrases in turn, are the basic units, the building blocks of his extended forms. The remaining examples will further illustrate more extended forms and show how Schoenberg's concept of "developing variation" grows from the same multiple dimensions of harmonic structure discussed above.

Throughout his writings, Schoenberg consistently stresses the importance of "harmonic" or "developing variation" for building extended forms, but he fails to say how to manage variation by twelve-tone techniques alone. Repetition, he says, is the basic principle of musical form, because form depends upon motives and motives can only be recognized if they are repeated. Non-primitive music, he says, conceals its repetitions through variation and development, methods which allow forms to be built or shaped.²⁸ Schoenberg defines variation as "changing some of the less important features of a musical idea, while preserving the more important ones."²⁹ The changing features create new ideas or themes, while the preserved features insure

$P_1(3)$
 $RI_{10}(1)$
 $P_{11}(2)$

A

 C

$P_7(1)$
 $I_0(2)$
 $I_4(3)$
 $RP_1(1)$

D

Basic Set: $\overbrace{G \ E}^D$ $\overbrace{D\text{-sharp} \ A \ C \ F}^C$ $\overbrace{F\text{-sharp} \ B \ B\text{-flat} \ D\text{-flat} \ A\text{-flat} \ D}^B$

Example 7. String Quartet No. 3, Op. 30, mm. 174-180

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$P_7(1)$

$P_7(2)$

Basic Set (1): $\overset{B}{G} \overset{A}{E} \overset{B}{D\text{-sharp}} \overset{C}{A} \overset{C}{C} \overset{A}{F} \overset{B}{F\text{-sharp}} \overset{B}{B\text{-flat}} \overset{C}{C\text{-sharp}} \overset{D}{G\text{-sharp}} \overset{C}{D}$

Example 8a. String Quartet No. 3, mm. 5-12

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$P_7(1)$

$P_7(2)$

C

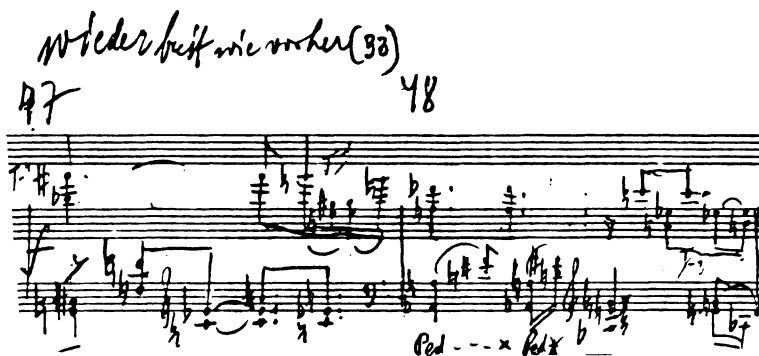
Example 8b. Sketch for String Quartet No. 3 (#999)

coherence of form. It would seem that development differs from variation in that it changes organically in a single direction toward some end. Variations can also change organically, of course, but to that extent they may be said to develop, rather than simply vary.

In "Composition With Twelve Tones," Schoenberg says that the basic set functions as the motive, and its repetition with what he terms "developing variation" generates form. The phrase "developing variation" seems to insist on an integral and organic relation among the varied repetitions of the basic set. Schoenberg does discuss several examples of developing variation in his lecture, but, as we soon discover from his sketches, his methods are more complex than he was able, or willing, to explain.

One example, from the Suite, Op. 29, will demonstrate the variation technique Schoenberg uses to associate two phrases in order to construct the "A" sections of a small ABA form. In a sketch for the Suite, (Ex. 9a), Schoenberg writes "Wieder breit, wie vorher (33)," referring to measure 33 where "wieder breit" previously occurred. The two passages appear in Examples 9b and 9c. Even though their soprano lines contain the same pitches (F sharp, G, D flat, C), differences in row forms, texture, instrumentation, and rhythm apparently conceal the formal connection suggested by the expressive marking and specified in the sketch. If we look more closely, however—beyond those tonal conventions Boulez finds so reactionary—we find that these phrases are not connected merely by a mood or tempo marking, but that the primary and secondary harmonic dimensions in both passages are very similar. This feature is concealed from immediate view because the vertical harmonies of the earlier passage consist of pitches that are adjacent in the row, while in the later passage they consist of pitches that are non-adjacent. But, nevertheless, equivalent forms of the tetrachords marked "A" and "B" on the basic set dominate the vertical harmonies of both passages. It is significant that only these two tetrachords appear more than once as linear segments of the basic set: tetrachord "A" occurs twice, and tetrachord "B" appears three times.

By emphasizing the same vertical harmonies in both passages, even though in the first they are formed from adjacent pitches in the basic set and in the second largely from non-adjacent pitches, Schoenberg is able to vary, but at the same time associate, two separate passages. This example helps us to understand more clearly Schoenberg's idea of "developing variation" in which nonessential features of a musical idea can change while essential ones recur. In this example, the nonessential features such as texture, instrumentation, and rhythm change almost beyond recognition, while the essential feature, the harmonic structure, remains constant. This example also exposes the naïveté of Boulez's criticism of Schoenberg's principle of developing variation. Boulez



Example 9a. *Skizzenbuch V* (Sk 612): Suite, Op. 29, Overture

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(RP₁) (P₁)

Bc I

VI

Va

Vc

f

f

f

f

10 7 3 3 7

9 8 1 1 5 9 10 11 12 7

12 6 4 4 6

11 5 2 2 8

A B A B C D C A C A

Example 9b. Suite, Overture, mm. 33-37

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(P₆)

(I₁)

Pf *f*

Ped.....*

A B B B E B E B A A

(P₆)

1 7 7

3 6 2 11

B B B B A

Basic Set: $\overbrace{\text{D-flat F}}^{\text{A}} \overbrace{\text{E A-flat C}}^{\text{B}} \overbrace{\text{A B-flat G}}^{\text{C}} \overbrace{\text{F-sharp D}}^{\text{E}} \overbrace{\text{E-flat B}}^{\text{A}}$

D

Example 9c. Suite, Overture, mm. 47-49

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argues that because the row must maintain a fixed intervallic succession, it demands a strict contrapuntal treatment and thus can not be easily combined with harmonic variation. This argument neglects completely the several dimensions of harmonic structure—and their use in achieving form—that Schoenberg developed from twelve-tone procedures alone.

The concluding examples will show, though only briefly, several techniques Schoenberg uses to generate form in the String Trio, Op. 45, a composition commonly regarded as among his most ambitious, but also among his most problematic. His sketches show him extending and systematizing procedures that appear in the previous examples. Most students of the String Trio have mistakenly described it as a hexachordal composition, meaning that it is based not upon a twelve-tone row, but on different orderings of combinatorially related hexachords.³⁰

The row tables for the String Trio, partially shown in Example 10, indicate that Schoenberg uses not a group of hexachords, but two basic sets: the first set contains eighteen pitches, and the second contains the usual twelve. In the eighteen-note set, labelled “Basic Set No. 1,” the first and last hexachords contain identical pitches, but they are ordered differently. The twelve-note basic set, labelled “Basic Set No. 2,” is a variation on Basic Set No. 1; its first hexachord is identical to that of Basic Set No. 1, and its second hexachord contains the same pitches, but in a different order, as the second hexachord of Basic Set No. 1. In his row tables, Schoenberg associates each prime form of the basic set with the combinatorially related row form that relates by I_5 , and both row forms always appear on the same system and unfold simultaneously. Notice that in the tables for Basic Set No. 1, Schoenberg has stemmed separately the first and last pitches of every hexachord. This produces from each pair of row forms twelve pitch-classes, which form a kind of secondary basic set. Throughout the String Trio, when Schoenberg presents two combinatorially related row forms, he frequently creates an extra harmonic dimension containing only the twelve pitches that begin and end the hexachords and that he stemmed separately in the row tables. And it is this dimension which often spans and unifies individual phrases.

One typical example, shown in Example 11, appears shortly after the introduction, and presents successively two combinatorially related row forms, P_2 and I_7 . The secondary basic set, comprised of the first and last pitches of every hexachord, appears in the violin, the principal voice marked “P”. It is this harmonic dimension, comprised primarily of non-adjacent pitches extracted from two row forms, that delineates the phrase. It is important to understand precisely how the combinatorial property affects the structure of this phrase. Most importantly it insures equal pitch-class distribution throughout the phrase, even though the row itself contains repeated pitches. While the combinatorial

Basic Set No. 1

Basic Set No. 2

Example 10. Sketches for String Trio, Op. 45 (#1055 and #1057)

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P_2

P
90
pizz.
 f

6 3 5 2 4 7 12

6 3 5 2 4 9 11 9 11

2 4 3 5 10 8 10 8 10

RI,
arco
18
13 12

15 17 15 17 14 17 14 16 17 11

14 16 14 16 15 16 15 14 10

arco 11 10

arco 8 10 10 10 10 10 10 10

Basic Set No. 1: $D \text{ } \overset{A}{\text{B-flat}} \text{ } \overset{C}{\text{E-flat}} \text{ } A \text{ } \overset{B}{\text{E}} \text{ } \overset{C}{\text{D-flat}} \text{ } B \text{ } \overset{A}{\text{A-flat}} \text{ } \overset{B}{\text{G-flat}} \text{ } \overset{C}{\text{G}} \text{ } \overset{C}{\text{F}} \text{ } C \text{ } \overset{C}{\text{E}} \text{ } \overset{B}{\text{D}} \text{ } \overset{A}{\text{B-flat}} \text{ } \overset{C}{\text{A}} \text{ } \overset{C}{\text{D-flat}} \text{ } \overset{B}{\text{E-flat}}$

Example 11. String Trio (Part I), mm. 12-17

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property does form one aggregate between measures 14 and 15, it in no way requires or forms the harmonic dimension that determines the phrase. To assume that in his later compositions Schoenberg depends on the combinatorial property to structure phrases, is to tell less than half the story: a misleading half, for Schoenberg in fact uses the same techniques to structure phrases in both his combinatorial and non-combinatorial compositions.

The next examples further clarify Schoenberg's concept of developing variation and show how it can generate large formal sections. Again the String Trio provides the example because of its experimental and enigmatic form. Even a cursory glance through the sketches calls into question one of Boulez's important assertions: that "Schoenberg was not much preoccupied with the problem of forms."³¹ Consider, for example, part of a table from his sketches for the String Trio, shown in Example 12. Here Schoenberg has tabulated the duration of every phrase in both beats and seconds, and arrived at a balance within each part of the composition and among all parts. Notice how his measurement in seconds accommodates the frequent changes in tempo and indicates a form that would not be suggested by merely counting the number of beats or measures in each part.

The String Trio consists of a single movement which is divided into five sections labelled Part I, Episode I, Part II, Episode II and Part III. Schoenberg bases Parts I and II on the eighteen-note basic set (Basic Set No. 1), and Episodes I and II on the twelve-note basic set (Basic Set No. 2). Example 11 shows the three linear tetrachords, marked "A," "B," and "C," that make up the principal motivic material of Part I. As the phrase in Example 11 indicates, these are the three tetrachords that remain after Schoenberg separates the first and last pitches of each hexachord to form a separate harmonic dimension. Not surprisingly, tetrachords A, B, and C get special emphasis. Not only do they often comprise the principal voices, but equivalent forms of them also often appear in the accompanying voices, formed by associating non-adjacent pitches in the basic set. With very few exceptions, every phrase of Part I simultaneously unfolds multiple occurrences of these tetrachords; they consequently dominate its harmonic structure.

Schoenberg builds the twelve-note basic set for Episode I around tetrachords A and C as linear segments, and develops this feature in one of the principal themes for Episode I (shown in Example 13). The principal voice of the theme unfolds tetrachords C and A, but not as they occur as linear segments. Instead, Schoenberg uses new forms made by associating non-adjacent pitches in the basic set, those with order numbers 1, 2, 4, 6 and order numbers 7, 8, 10, 12. In addition two other dimensions of harmonic structure also repeat forms of tetrachords A and C. The viola plays one form of tetrachord C comprised of

Pickup	meas	meas	number of measures	Measure	number of measures		seconds	total
1	4	4	$d=60$	16			16	
5	1	4	accel	4			3	
6	11	6	$d=90$	12	$90/12=7.5$		7.5	
12	17	6	$d=90$	12	$90/12=7.5$		7.5	
18	40	23	$d=90$	46			31	
4	4	4	$d=120$	12			6	
2	57	7	$d=60$	140	PART I		14	$\frac{85}{1.25}$
52	56	5	$d=60$	10	$\frac{120}{60}=2$		6	
57	62	6	$d=60$	24			24	
63	64	2	$d=54$	8+3			9	
65	66	2	$d=54$				3	
67	70	4	$d=54$	16			19	
71	80	10	$d=72$	40			22	
81	82	2	Rec'd 8				15	
83	84	2	$d=84$	8			6	
85	—	1	$d=54$	2			2	
86	97	12	$d=54$	24			27	
88	100	3	accel	6			4	
101	104	4	$d=120$	24			12	
105	108	2	Rec'd				15	
107	111	4	$d=72$	18+4=20			17	
107	111	4					17	
19	1						3' 21"	

Example 12. Sketch for String Trio (#1067)

	meas 20	meas	number of ms	Melody	number of notes		seconds	total
	111 1/2	119	8 1/2	d=72	34	Transport =	29"	1.25"
	120	121	2	"	8		7"	3' 21"
6/8	122	127	6	d=104	36		20	
6/8	128	130	9	d=80	18		14"	
"	131	132	2	RIT	15	1st tempo 4.80	10"	1" 20
	133						6' 06"	6' 06"
3/4	133	141	9	d=80	27	PART II	20"	
6/8	142	145	3 1/2	d=104	30		18"	
4/4	146	147	2	d=72	8		7"	
6/8	148	154 1/2	7 1/2	d=104	45		27"	
"	155		11	ad lib	6		7"	
"	156		1 agitato		6		4"	
"	157	158	2	Rit?	12		15"	
9/8	159	169	11	d=52	33		42"	
3/4	170	—	1	"	3 agitato		4"	
1/4	171	173	3	Rit			5"	
1/4	174			174		14 9"	2' 29"	
6/8	175			175		2' 29"	2' 29"	

Example 12 (continued)

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a tempo

P₁₀

C

I₃

p

A

A

Basic Set No. 2: $\overline{\text{B-flat } \text{G-flat } \text{B } \text{F } \text{C}}^{\text{A}} \overline{\text{A } \text{D } \text{C-sharp } \text{E } \text{G } \text{E-flat } \text{A-flat}}^{\bar{\text{A}}}$

$\bar{\text{C}} \quad \text{C}$

Example 13. String Trio (Episode I), mm. 85-86

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non-adjacent pitches with order numbers 3, 5, 9, 11, and this dimension joins both measures and makes them a single phrase. Moreover, the accompanying voices present the eight-note complement of tetrachord C (marked "C") in the first measure and A (marked "A") in the second. This last dimension is controlled by the combinatorial property, and arises by joining the combinatorially related row forms P_{10} and I_3 . Thus, this phrase has four simultaneous harmonic dimensions, all of which unfold equivalent forms of two tetrachords or their complements. It is essential to recognize that all of the harmonies marked in Example 13 are formed by pitches non-adjacent in the basic set or by pitches from different row forms. This feature in Episode I develops the motives of Part I, in which the principal voices (those marked "P") present tetrachords A and C only as linear segments of the row. The third principal motive of Part I, tetrachord B, does not occur in Episode I and must wait until Part II to be repeated or developed further. Episode I is thus not a repetition of Part I, for it omits essential motives. Rather, it represents a variation, as well as a development of two of the three principal motives of Part I. We can perhaps now understand why Schoenberg refers to this section as an Episode—it fulfills precisely the function of the episodes of Baroque fugues by repeating, varying, and developing elements of the principal thematic material, and it does so through twelve-tone procedures alone.

The last example (Ex. 14), also from the String Trio, makes a final point: that contemporary theorists, by characterizing Schoenberg's later works as hexachordal compositions, have somewhat misunderstood and obscured the innovative techniques he has developed for building extended structures. Example 14 shows a phrase from Part II in which tetrachord B returns; tetrachord B, you remember, was the only principal motive of Part I not developed in Episode I. The phrase in Example 14 unfolds four pairs of hexachords; each pair represents the second pair of hexachords formed by pairing combinatorially related forms of the eighteen-note basic set. Three harmonies structure this phrase, each of which represents a linear segment of the basic set. The first is tetrachord B, the chromatic tetrachord, a form of which each instrument plays once in every measure; each measure therefore consists of three different forms of tetrachord B. The second structural harmony represents a hexachord, marked "D," which binds together the three instrumental parts. Each half measure unfolds this hexachord, which is always comprised of pitches from two row forms. The third structural harmony, the whole-tone tetrachord, marked "E," binds together the four measures into a single phrase. Notice that the transpositions of the four successive row pairs— $P_{11} I_4$, $P_9 I_2$ and so forth—outline the whole-tone tetrachord. Thus, although the harmonies that structure this

$P_{11}I_4$ P_9I_2

Moderato $\text{♩} = 104$

con sord. p

con sord.

con sord. p

D D D D

$P_{11}I_6$ P_9I_3

p

sempre p

D D D D

Basic Set No. 1: (P_9) D A sharp D sharp (A E C sharp) B (A flat F sharp) G F C E D B flat A C sharp E flat
 (I_4) G B F sharp C F G sharp B flat D flat E flat D E A F G B C A flat G flat

D D D D

Example 14. String Trio (Part II), mm. 148-151

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phrase are formed by pitches from two or more row forms, they all occur as linear segments of the eighteen-note basic set.

Contemporary theorists have noted these structural harmonies, but have failed to recognize their ultimate source in the basic set. Instead they have argued that the piece is structured on the harmonies derived from pairs of combinatorial hexachords.³² This argument can sometimes find evidence. In the paired combinatorial row forms at the bottom of Example 14, for instance, two of the three structural harmonies, marked "D" and "B," do in fact link together the paired hexachords. But this argument can not explain the source of tetrachord E, the whole-tone tetrachord that shapes the phrase, and so the proponents of a hexachordal basis for the String Trio can only assume that Schoenberg has had to impose an arbitrary form. I certainly do not want to maintain that harmonies formed by combinatorial hexachords never represent linear segments of the row. Obviously many often do, and no doubt Schoenberg designed his basic set to develop this feature. But it is undeniable that many harmonies formed by the paired hexachords are not emphasized. Theorists have noted this fact with some puzzlement, because they have not understood that Schoenberg uses as structural harmonies only those that represent linear segments of the basic set. Failure to recognize this principle is easy to understand. If Schoenberg often presents only one hexachord from a row form, why not say that hexachords, rather than a basic set, control the piece? The String Trio makes this view even more tempting, for its row no longer contains only twelve pitches. Thus, it is easy, even attractive, to ignore the fact that Schoenberg does usually present the complete row, and to concentrate on the recurrence of hexachords which appear to be freely ordered, that is, not dictated by a basic set. In other words, theorists have found it easier to relinquish the concept of the basic set, then to relinquish the rule that a basic set contains twelve pitches. The sketches, however, show precisely the opposite, that he was willing to relinquish the rule that a basic set must contain twelve pitches, but not the concept of a basic set itself as the source for the harmonic and formal structure of his music.

In that half-hearted manifesto "Composition With Twelve Tones," as everyone remembers, Schoenberg proposed three fundamental principles for his new method: that the basic set alone generate harmonic and formal structure, that the basic set contain only twelve pitches with no pitch repeated, and that a composition have only one basic set. But to judge by his music and his sketches, we ought probably to see these three principles arranged as a hierarchy. Schoenberg is willing to modify and experiment with the latter two: the Third Quartet uses not one but three orderings of the basic set; the String Trio uses two basic sets, one of which has eighteen notes. Neither the number of basic sets

nor the number of pitches in each set is absolute, then, but if we analyze pieces in which they are not absolute, we discover that Schoenberg modifies his principles with the sole purpose of expanding or redefining harmonies of the basic set in order to generate more elaborate and integrated formal structures. The first principle—that the structure and form of twelve-tone music derive from a basic set—is absolute and in fact both motivates and controls departures from the secondary principles.

Schoenberg's critics, lacking the evidence of his sketches, have not recognized that what seemed his inflated claims for his method were actually its one absolute. They were mistaken, but in a sense justified, in complaining that he went too far in discarding techniques comparable to tonal harmonic functions or, like Boulez, that he did not go far enough in developing uniquely twelve-tone techniques for producing extended forms. And those contemporary theorists who bend his most important principle by identifying hexachords as the bases for his later music, confirm the criticisms of the skeptics—that he had to rely on arbitrary or contradictory procedures to build extended forms.

As he superstitiously feared, Schoenberg died on Friday the 13th, July 1951 in Los Angeles. But since the music he wrote and the methods he invented prove less derivative and arbitrary, more coherent and fruitful, than he cared to explain, we can confidently apply to Schoenberg what the poet said of Dürer, "Dead is he not, but departed—for the artist never dies."³³

For those who may find it useful, I list below the pitch-class set names according to Forte's *The Structure of Atonal Music* for the lettered pitch-class sets in the musical examples.

Example 1

A : 6-2

Example 2

a : 3-4

b : 3-9

c : 3-12

d : 3-4

ab : 6-16

ac : 6-16

cd : 6-16

db : 6-16

Example 3

a : 3-4

b : 3-9

c : 3-12

d : 3-4

A : 6-16

B : 6-z48

\bar{B} : 6-z26

Example 4

A : 6-20

Example 7

A : 7-10

B : 9-10

C : 8-27

D : 7-32

Example 8

A : 7-32

B : 5-32

C : 4-14

Example 9

A : 4-17

B : 4-19

C : 4-10

D : 4-3

E : 4-7

Example 11

A : 4-9

B : 4-1

C : 4-7

Example 13

A : 4-9

\bar{A} : 8-9

C : 4-7

\bar{C} : 8-7

Example 14

B : 4-1

D : 6-32

E : 4-21

NOTES

This paper is an expanded and revised version of a lecture delivered at the AMS/SMT National Conference in November, 1979.

1. "Schoenberg Is Dead," *The Score* 6 (1952), pp. 18–22. See also Boulez, *Notes Of An Apprenticeship* (New York: Alfred A. Knopf, Inc., 1968) and *Conversations with Célestin Deliège* (London: Eulenburg Books Ltd., 1976).
2. Milton Babbitt and David Lewin are most prominent among those who have considered the same difficulties Boulez points to. See especially Babbitt, "Some Aspects of Twelve-Tone Composition," *The Score* 12 (1955), pp. 53–61; "Twelve-Tone Invariants as Compositional Determinants," *The Musical Quarterly* 46 (1960), pp. 246–59; "Set Structure as a Compositional Determinant," *Journal of Music Theory* 5 (1961), pp. 72–94; and Lewin, "A Theory of Segmental Association in Twelve-Tone Music," *Perspectives of New Music* 1 (1962), pp. 89–116; "A Study of Hexachord Levels in Schoenberg's Violin Fantasy," *Perspectives of New Music* 6 (1967), pp. 18–32; "Inversional Balance as an Organizing Force in Schoenberg's Music and Thought," *Perspectives of New Music* 6 (1968), pp. 1–21.
3. Schoenberg's claim that the basic set regulates all harmonic and structural elements has met with considerable skepticism. Skeptics assert that "licenses," such as reorderings, repetitions, and association of non-adjacent segments of the basic set, as well as the verticalization of ordered segments to form vertical harmonies, result in many events unrelated to the basic set and point toward serious weaknesses in his twelve-tone method. This skepticism began during Schoenberg's life and has continued until the present. The following can fairly represent it: Richard S. Hill, "Schoenberg's Tone-Rows and the Tonal System of the Future," *The Musical Quarterly* 22 (1936), pp. 14–37; Ernst Krenek, "New Developments of the Twelve-Tone Technique," *Music Review* 4 (1943), pp. 81–97; Peter Stadlen, "Serialism Reconsidered," *The Score* 22 (1958), pp. 12–27; Seymour Shifrin, "A Note From the Underground," *Perspectives of New Music* 1 (1962), pp. 152–53; George Perle, *Serial Composition and Atonality* (London: Faber and Faber Ltd., 1962), pp. 61–110 and *Twelve-tone Tonality* (Berkeley and Los Angeles: University of California Press, 1977), pp. 23–24. Various theorists and composers have refused to interpret these "licenses" as weaknesses, but have not succeeded in explaining how they are regulated by the basic set. See for example the responses to Stadlen's article by Walter Piston, Roberto Gerhard, and Roger Sessions, all in *The Score* 23 (1958), pp. 46–64. The inadequacies of these responses is aptly pointed out by George Perle, "Theory and Practice in Twelve-Tone Music," *The Score* 25 (1959), pp. 58–64. George Rochberg in his review of Perle, *Serial Composition and Atonality*, harkens back to the earlier responses by ignoring entirely Schoenberg's theoretical claim while explaining away his "licenses" by appeal to creative genius (*Journal of the American Musicological Society*, 16 [1963], pp. 413–18). René Leibowitz and Josef Rufer, on the other hand, tend to ignore the whole issue and merely describe uncritically Schoenberg's procedures and his use of classical forms. Babbitt comments tellingly on the superficiality of this approach in his review of Leibowitz, *Schoenberg et son école* (Paris: J. B. Janin, 1947) and *Qu'est ce*

- que la musique de douze sons?* (Liège: Editions Dynamo, 1948) in *Journal of the American Musicological Society* 3 (1950), pp. 57–60, as does Krenek in his remarks on Rufer, *Die Komposition mit zwölf Tönen* (Berlin: Max Hesses Verlag, 1952) appearing in “Is The Twelve-Tone Technique on the Decline?” *The Musical Quarterly* 39 (1953), pp. 513–27.
4. “Schoenberg Is Dead,” p. 20.
 5. “Schoenberg Is Dead,” p. 21, and see also “Trajectories: Ravel, Stravinsky, Schoenberg” in *Notes Of An Apprenticeship*, pp. 256–58.
 6. “Schoenberg Is Dead,” p. 18.
 7. The first passage is from “Problems of Harmony” in *Style and Idea*, ed. Leonard Stein, trans. Leo Black (New York: St. Martins Press, 1975), p. 279; the second from “Opinion Or Insight?” in *Style and Idea*, p. 263.
 8. Schoenberg, “Composition With Twelve Tones (1)” in *Style and Idea*, p. 218.
 9. “My Evolution” in *Style and Idea*, p. 88.
 10. “Tonality and Form” in *Style and Idea*, p. 257.
 11. For further discussion see my article “The Telltale Sketches: Harmonic Structure in Schoenberg’s 12-Tone Method,” *The Musical Quarterly* 66 (1980), forthcoming.
 12. Schoenberg, “Vortrag / 12 T K / Princeton,” ed. Claudio Spies, *Perspectives of New Music* 12 (1974), p. 83.
 13. “Composition With Twelve Tones (1),” p. 235. In the following examples I have added standard row labellings, letter labels of pitch-class sets, and the basic set below each example. Appendix I gives Forte’s pitch-class set names for the lettered pitch-class sets in the following examples.
 14. The pitch-class content of the complementary hexachords in this secondary harmonic dimension further suggests that Schoenberg was aware of this compositional procedure; each contains the same pitch-classes as the complementary hexachords in P_6 , the only transposition of the basic set used in the entire composition. I owe this insight, as well as a thorough and generous reading of my manuscript, to David Lewin.
 15. See, for example, Perle, *Serial Composition and Atonality*, pp. 99, 109–10.
 16. For further warrant for this inference see Boulez, “Schoenberg’s Piano Works” in *Notes Of An Apprenticeship*, p. 375.
 17. “Vortrag / 12 T K / Princeton,” p. 88.
 18. This and all other sketches discussed in this paper represent hitherto unpublished sketch material in the Arnold Schoenberg Institute, University of Southern California, Los Angeles, California. The catalogue number for each sketch appears with the example.
 19. Schoenberg has worked out a second harmonic structure indicated by the lettering “c” and “d” at the top of the sketch. While he uses this structure later in the second movement, it does not apply to the example under discussion.
 20. See Boulez’s confusion about precisely this example in “Trajectories: Ravel, Stravinsky, Schoenberg,” *Notes Of An Apprenticeship*, pp. 256–57, and in *Boulez On Music Today* (Cambridge: Harvard University Press, 1971), p. 132.
 21. For further discussion of the *Suite*, Op. 29, see my dissertation, “Schoenberg’s Concept of Multi-Dimensional Twelve-Tone Music: A Theoretical Study of the Music and Compositional Sketches” (Yale University, 1977).

22. See, for example, Perle, *Serial Composition and Atonality*, pp. 123–28.
23. See Note 3 for the most important articles that deal specifically with combinatoriality and invariant properties.
24. “Vortrag / 12 T K / Princeton,” p. 99.
25. For a more detailed analysis of this example, see “The Telltale Sketches” which was somewhat anticipated by Professors Reinhold Brinkmann and Jonathan Khuner in letters to the editor of the *Journal of the Arnold Schoenberg Institute* 1 (1976–77), 182–89.
26. Included with the sketches for Op. 30 is a second row table (#1003) in which the reorderings of the basic set (M_2N_2 , M_3N_3) are different from those shown in Example 6. This table, notated in English, was prepared in 1935 for a class in Los Angeles, eight years after Schoenberg completed the composition. I owe this information to Leonard Stein. While I can not explain why the two row tables do not show the same reorderings of the basic set, it is clear that the principal ones for the first movement are those appearing in Example 6 (#1002).
27. In Example 7 I have used the second theme as it appears in the “recapitulation” because its secondary harmonic dimensions are somewhat less complicated than in the “exposition.” In its first appearance, the secondary harmonic dimensions derive from the second form of the basic set, perhaps suggesting a modulation away from the principal form; in its second appearance, the secondary harmonic dimensions derive only from the principal row form, implying a return (“recapitulation”) to what Schoenberg considered the principal form of the basic set. In this and the following examples I do not discuss the role of invariants in structuring phrases because this technique has been investigated by other theorists (see note 3 above).
28. “For a Treatise On Composition” in *Style and Idea*, pp. 265–66.
29. *Fundamentals of Musical Composition* (New York: St. Martin’s Press, 1967), p. 8.
30. See, for example, George Rochberg, *The Hexachord and its Relation to the 12-tone Row* (Bryn Mawr: Theodore Presser, 1955), pp. 4, 40.
31. “Schoenberg Is Dead,” p. 20.
32. See, for example, George Rochberg, “The Harmonic Tendency of the Hexachord,” *Journal of Music Theory* 3 (1959), pp. 218–30.
33. Henry Wadsworth Longfellow, “Nuremberg” in *The Complete Poetical Works of Longfellow* (Boston: Houghton-Mifflin, 1893), p. 57.