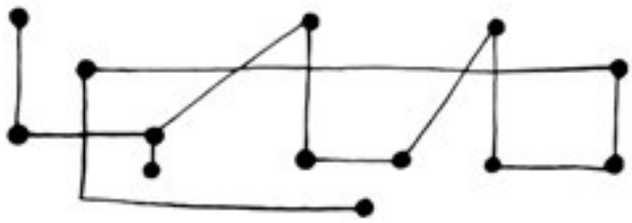
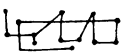


META-VARIATIONS, PART IV: ANALYTIC FALLOUT (I)

BENJAMIN BORETZ



> In every activity, satisfactory performance requires meticulous care in some matters. . . . What choices fastidiousness will dictate will vary with the individual. . . . But if that were good reason for indifference, then variations in taste and belief would be good reasons for indifference about quality in art and about truth in science.
>
> —Goodman [55]

> . . . clarity is more fruitful on the average than confusion, even though the fruits of neither are to be despised.
>
> —Quine [66], p. 123

1. ANALYSIS AND COMPOSITION

The purpose of an analysis (or a composition) is to reconstruct (or construct) a musical structure. We bother to reify "analysis" (and "composition") and "analytic methods" ("compositional methods" or "techniques") because of the conviction, reinforced by confirming practice, that, beginning from the simplest levels of intersubjective auditory experience, pieces are constructible most favorably up to a certain point through hierarchical functional paths that may be considered to be shared by all, then, beyond that point, through increasingly divergent, coherently subdivided paths, up, finally, to the singular stem: the individual piece. Now what these shared aspects are is not best understood as a "common practice" or "common language," because that viewpoint is more appropriate to a construction where the individual's importance is mainly that of an *instance* of structure in a domain of such structures. Here, the domain itself, and its model, are reified mostly as a map that juxtaposes (and superposes) the individual maps of individual pieces, resulting in a composite map that shows as single

entities the intersections among all the maps that are nondivergent at the places where those entities occur; and, of course, any place where just one map is so nondivergent (i. e., from itself), contains whatever is associated uniquely with one piece. Principally, the value of this association is to make it unnecessary to reconstruct each piece as a phenomenon utterly *sui generis* beyond its characteristics as an "auditory object" at the purely "discriminative-perceptual" level. By deciding that certain predicates (terms) defined in certain ways and in a certain hierarchical order are correspondingly useful in the construction of a more or less long list of phenominal objects, we reify, in turn, (e. g.) "music," "content music," "construct-centric music," "pitch-centric music," "tonal music," then perhaps some sub-categories determined by transposition-structural or intertriadic linear-structural characteristics (the first of which might distinguish, say, Mozart from late Beethoven and Schubert, and the second, say, Brahms from Wagner), and then, finally, such "categories" as "Beethoven's Sixth Symphony." In short, we find it useful to have each such predicate generalized to the maximum degree possible, consistent with the essential particularities that capture the sense of the intuitive concept involved, precisely because we want to know the maximum extent to which we can regard a given composition as *individual;* and by inferring the maximum set of *shared* characteristics it exhibits (along with some idea of the range and extent of the list of compositions with which each such characteristic is shared), we can, thereby, focus on that which is, in just the same sense, unique to the work in question. But it should be borne in mind that one of the most strongly identifying characteristics of this conceptual picture of music is the notion that we can in principle consider the total constructional hierarchy of each single piece to be inferrable from its data alone, without recourse to a conventional lexicon or grammar (which, of course, does not mean that we do not wish to make *any* assumptions, only that it is conceivable that anything assumed *might* have been inferred without necessary reference to any other contexts "of the same nature"). Were it not for this radical contextuality, the generalizing kind of activity would be more "scientifically interesting" than "musically crucial," for our *musical* stake is in discovering as many *respects* as possible in which pieces can exhibit particularity of choice among alternatives, as many dimensions as possible of significant variability

(where, hence, choices make a difference) and, thus, of individuality of identity.

Thus our interest in *comparing* pieces is not like our interest in comparing sets or passages within pieces, nor like our interest in comparing the behavior of rats in one controlled experimental environment with their behavior in another. In one sense, of course, the composer is somewhat like the scientist who wants to *predict,* on the basis of a particular observational path through a complex of data, what is likely to result, as observable relational behavior, from a different, as yet untested, data-complex, which is to be first hypothesized, then realized in the form of a set of instructions for the physical conjoining of available entities into prescribed relative dispositions. Nevertheless, the concept of a theory of music as predictive or post-dictive in a *normative* sense (as a way of sorting pieces into, say, "coherent" and "incoherent") seems hardly fruitful as compared, simply, to a maximal commensuration among explanations to further their cognitive content by giving them an ample comparison-domain for context, and thus also increasing the degree of individuation that they are able to confer on their subjects.

So, again, we compare individual pieces only to infer some terms whose interpreted transfer from one context to the other gives the attempt to "understand" a particular piece the benefit of discoveries and insights that have emerged in the course of "understanding" another (both "understandings" being simply equivalent to "reconstructing" or "constructing"). In previous sections, by considering reconstruction from "bottom" to "top," I distinguished among those predicates whose theoretical definitions were identical for all music, and some extrasystematic concepts which could be correlated with disparately defined theoretical terms in different systems ("polyphony," "counterpoint," etc., are concepts of this latter type). These, however, arise at the very point of first divergence in the foundation system. The question, then, is, can we in fact make use of super-syntactical structural observations in one systematic domain to assist cognitively the explication of structures defined as being in another? That is, beyond the shared systematic level, can the analytic reconstruction of a tonal piece help us to understand or to compose a twelve-tone piece or any other piece of a non-tonal kind? The answer would appear to lie in the analysis of some extrasystematic structural concepts that might be

generalized at a high descriptive level, independent of, and variably but precisely correlated with, actual syntactic models themselves.

Frequently, such identification is attempted through a simple confusion of categories in which a structure otherwise undefined in terms of a system in which some single predicate occurs is assigned that predicate without further interpretation, or in effect treated in a very partial sense as an instance of some system, without consideration of the remaining aspects of either the piece or the system; as, the assignment of words like "cadence" and "phrase" in their tonal sense (or without specified alternative sense) to non-tonal pieces. This practice, and uses of such terms as "polytonal," "quasi-tonal," "freely tonal," or "pan-tonal," produce a similar indeterminacy of reference that results from the apparent incompatibility of a defined functional term with an associated one, where the latter either 1) is represented by the same name as the familiar one, but is simultaneously defined in some new, inconsistent, sense, or 2) is a term conjoined to the familiar one that either denies some fundamental characteristic of the original, or is simply left undefined. The narrowness that such a critique may suggest to some readers wishing for a maximum latitude in the use of theoretical terms is simply an unavoidable result of the belief that only maximum cognivity yields maximum musical "characteristicness." Consider the cognitive consequences of such "freedoms" as the supposed "mixture" of separately well-defined systems which, however, simultaneously interpret the same "acoustical" events in ways that are not simultaneously tenable. For even where every element in a composition is a member of many subset-successions, even of different types at different levels, these interpretations are compatible as long as there is a *single* ultimate background system that subsumes all of them as a medium for their coherent interrelation. But they are *incompatible* where the background system employed to obtain one interpretation must be replaced by another background system—one for which no correlation to the first is established—to generate the other. Similar cognitive problems arise with the mixture of well-defined with undefined or ill-defined systems ("degree of definedness" should be understood as signifying "extent of *discoverable definability*"). In both cases, the result is a net *loss* in "freedom" or, what amounts to the same thing, understandability, the cognition of *how* a piece "is itself." For maximizing understandability maxi-

mizes the numbers of different ways in which things can be distinct entities; hence it leads to the existence of a maximum number of things among which there is freedom to choose. Otherwise, we get the paradoxical result that greater freedom is associated with a *reduction* in the *number of distinct choices available* in the world.

The possible suspicion that this argument is "mere semantics"—"why should the *music* be affected by differences over terms and definitions; isn't it all just a question of what *names* are given to the *same things?*"—will, I hope, have been adequately intercepted by what has preceded; but perhaps it deserves special consideration with respect to the "mixed-system" question. Here an example cited by Goodman (in [55]) in connection with a similar problem in philosophic systems may be useful: "Suppose that in a certain game a player is to begin by dealing each card from his hand onto the table at either his left or his right; he may put any card on either side and may move a card from side to side if he likes. Then while it is quite true that he is free to put any card on either side, he can never get a left-hand card on the right-hand side; for a card is a left-hand card or a right-hand card according as it lies on his left or his right." And thus, to paraphrase Goodman's conclusion, we can construe *any* sound-succession as a tonal or a twelve-tone structure; or as a manifestation of one key or any other key; but we can no more construe a twelve-tone trichord as *also* a tonal triad in the same piece under the same explanation, or a two-triad complex *as at the same time* (i. e., at the same level of the same reconstruction) two equivalent and simultaneous but distinct *tonic triads;* or a single one as equivalently and at the same time a tonic and a dominant triad (n. b. *equivalently*), any more than we can, in Goodman's game, get a left-hand card on the right-hand side.

And with respect to "interpretative freedom," and the plea for "semantic tolerance" urged by many writers, presumably to maximize flexibility in subsuming pieces under "music," I would say that the more fastidious we are regarding the cognitive status of the *theoretical grounds* on which anything is admitted to the category "music," the more such an admission when it does take place is worth, because of the far greater chance that it actually confers some meaningful conceptual-perceptual status (in the sense of "what," not "how worthy") on the thing admitted. In other words, the higher our standards of admission, the more generous we are,

in the end, with respect to the consequentiality we ascribe to such an admission. Of course, each individual must choose his own standards of what he counts as adequate musical cognitiveness. But theorists and analysts are supposedly devoted to the maximum elucidation of what is intersubjectively cognitive about pieces, and thus, on their part, taking tolerant attitudes toward variable standards of musical cognitiveness is not only intellectually unbecoming, but hardly serves their presumed professional self-interest. For a theorist may be tolerant of any listener's music-cognitive awareness or demands, and even of his own or other theorists' "musical tastes"; but he can hardly afford to be equally tolerant of his own or other theorists' standards of music-theoretical adequacy or cognitiveness, or else he has very little business setting himself up as a theorist, analyst, or other kind of explicator of "music" instead of as an appreciationist or enthusiast.

The question of *what is admitted* as music is itself quite variable depending on the context of admission. The listener, or the theorist himself as a listener, can be as capricious and cavalier as he likes in making admissions; but *as* theorist or analyst, he may admit whatever he likes only as long as his tolerance regarding *what* he admits is accompanied by an equivalent intolerance in the application of *his own standards* of what constitute adequate grounds for such admission, and what constitutes an adequately cognitive account of how such an admission is to be understood. Whether these standards, in turn, will prove acceptable to other theorists, analysts, and listeners, is, of course, subject to all the same considerations. Again a remark of Goodman's seems apt here: "I admire the statesman tolerant of divergent political opinions, and the person tolerant of racial and educational differences, but I do not admire the accountant who is tolerant about his addition, the logician who is tolerant about his proofs, or the musician who is tolerant of his tone" (*sic:* we cite Goodman for philosophical, not musical aptness).

Some writers, especially in the field of contemporary music, have demonstrated an awareness of these problems by using, for the "structural concepts" to be transferred from one system-domain to another, "neutral" terms like "event" and "continuity" as general structural terms; but most often these terms are applied on the apparent basis of a vague synesthesia that gives them little cognitive value beyond the simple avoidance of the more blatant confusions

mentioned above. But, their employment usually has at least the virtue of being vacuous with respect to *any* theory, rather than positively destructive of what may be mildly cognitive in the customary applications of some particular theory or other.

So it will be my effort in what follows to demonstrate some of the direct analytic applications of the general view of music I have been developing in this essay, and specifically of the general model for music sketched in Parts II and III. An attempted explication of predicates such as "continuity" and "event" as high-level "communicants" among pieces having distinct syntactical bases is the substance of the later sections. In the parts that immediately follow I consider the implications of the availability of our model in dealing with problems in analysis that have appeared heretofore to require very elaborate adjustments of familiar systems or special constructions of new general syntaxes, in order to explain their objects and either associate them with an existing literature, or reify a new one for their (collective) benefit. A prime normative criterion used as a guide in this consideration is that of analytic simplicity.

2. ANALYTIC SIMPLICITY AND SYSTEMATIC GENERALITY

In the absence of a background music-syntactical model such as has been proposed herein, analysts have tended to deal with "problematic" pieces, or chronologically proximately composed groups of such pieces, by one or more of the following expedients:

1. They accept a standard of "total-structural" explanatory adequacy far below what they would accept for "known-systematic" music. (See my remarks on Perle [29] in [7].)

2. They plug such problematic pieces into existing general-systematic models whose normal justification and motivation for construction and application is the high degree of uniformity they confer on particular literatures, even though such plugging in requires the acceptance of a considerably reduced standard of uniformity at many levels of structure, even with respect to the very number and status of the levels of structure on which such uniformities can even be asserted. Examples of this phenomenon abound in the literature; some of the most sophisticated examples are to be found in the analyses of 20th-century composi-

tions in Salzer's *Structural Hearing,* in Forte's *Contemporary Tone Structures,* in Imbrie's "Roger Sessions" (PNM, I/1) and in Mitchell [28].

3. They construct an uninterpreted system which is explicated as determining a correlation of the data of problematic musical structures with analyses of structure in other, non-musical, domains, with questionable effectiveness in accounting for the music-epistemic significance of the correspondence involved. Numerous examples from European literature, including several of the principal articles published in *Die Reihe,* may be cited in connection with this technique, but it seems also to inform much of the literature concerned with connecting music with stochastic, statistical, or psychological processes, as well as many efforts at constructing a verbal-linguistic model for music.

4. Finally, there is the attempt to construct an entire new general-syntactical model to reify a group of problematic pieces *as* a neo-literature of a sort analogous to the existing "unproblematic" literatures. One such account of a background model for the "literaturization" of "motivic" music (my preferred name for what Babbitt calls "contextual" and almost everyone else "atonal" or "freely atonal") that correlates musical relations with set-theoretic operations in a way that accounts for music-epistemic factors in just the domains of pitch-class and interval-class relations (but not in the domain of order-class relations) is to be found in Forte [15], some aspects of which are considered more particularly below.

Now the motivation for these variant explanatory maneuvers is clearly that, in the absence of either a general background theory for music, or a general syntactical model for a "literature," there remains a relatively large number of pieces that a relatively large number of people care about having as part of music, which cannot in any known cognitive sense be so included, because no one has yet found an acceptable way to describe them as musically coherent. But with an all-musical background theoretical model, such as the one developed in Part II, the situation is materially altered: the compulsions to reify a literature, to find some general structural paradigm at some *particular* structural level that makes every composition a member of some group of a certain kind, to force everything into some *existing* model of musical structure, or to accept a

greatly reduced standard of musical coherence, are considerably relieved when musical coherence is regarded as a *direction* on a relativistic scale rather than an absolute *attribute,* and when, as is possible with such a background theory, everything likely to be regarded as a potential piece can be shown to be coherent to at least a certain degree if it is admissible at all—and all it has to be to be admissible is a finite succession of discriminable (and discriminated) auditory phenomena that someone wants to regard as music. Whether after observing the degree of coherence that can be ascribed to it under the best reconstruction we can produce we will not think it more useful to take our piece to another domain is dependent only on, again, how much coherence we require in those things we are willing or eager to regard as "usefully regardable as music," and, of course, how hopeful we may be that by using the yardsticks of some particular other domain we are likely to arrive at some more satisfactory explanatory results—such greater satisfactoriness being dependent both on the scope of the explanation derivable from such another domain and on our willingness to accept the normative or epistemic implications of the association of our piece with the other entities in that domain as well as with the legend on the sign on its door.

Now since the lowest possible degree of correspondence to the definitions offered herein, by anyone's criterion of musical admissibility, must still be greater than zero, all things presented as candidates for music that have *just zero* correspondence to those definitions are not—*as music*—ever anything that could be called "negatively coherent music" (or "positively chaotic music"), or in some way "negatively distinctive," whatever that might mean, but simply are—*as music*—all alike, insofar as they all share a *lack* of the *same totality* of music-identifying characteristics (insofar, in turn, as our music-identifying capacities can tell). What they are alike *in* is, in fact, just being "something else." For our definitions are predicated on the notion that any specified finite set of auditory phenomena may be regarded, and regarded in a virtually inexhaustible number of ways, "as music." It is true, however, that neither a goat, say, nor a heat wave, are admissible under this restriction (to auditory things). And where *they* would be presented as "two distinct candidates for admission as music," they would indeed be "identical as music in being something else." But although such entities have been, and are increasingly being, pre-

sented as music, there are also strictly *auditory* entities being presented as music which, we are told, are in fact (partly or wholly) "chaotic." Here someone is fooling himself, because, first, if we *do* regard something as *relatively* chaotic (some or all of it as somewhat chaotic, not some part of it as wholly chaotic) as music, that just characterizes the *negative* circumstance that we have been able to attribute to it only a *low degree of coherence.* (If we *choose* to regard it as *utterly chaotic as music,* we would simply be converting it, at the perceptual end, into something musically characterless *for us;* or, in other words, it would be *identical as music for us* with heat waves and goats. But it seems a virtually empty possibility that we would ever *have* to so regard any succession of auditory things.) But, second, it seems (and has proved in practice) that what is far more likely to happen with something presented as music that its maker has designed in a way appropriate to his notion of "chaos," is that it will tend to break down into trivial, commonplace, or gross kinds of coherences in its audition by reasonably experienced receptors. The trouble is that the desired chaos, no matter how bad a boy the would-be perpetrator thereof is willing to be, is simply unavailable (except by extramusical agreement) because it is an empty notion in the first place; and what he perpetrates is far less likely to appear destructive or nihilistic than just commonplace.

And since a background theory thus relieves us of the worry with respect to most pieces we care about that they will not be "admissible as music," we can all the more firmly hold to adequate cognitive standards (the ones we care about with respect to most pieces) in the explication of, and for the admission of, *any* piece that *is* so admissible. For we are able to sustain a crucial distinction between *what something is as music* and *whether something is music;* and it *is music* just because what we are going to make of it depends on what we make of any array of relational information obtained through observational measurements on an array of auditory things with respect to such matters as pitch characteristics, interval characteristics, modular-equivalence characteristics, registral characteristics, "earlier than-later than" characteristics, etc.—in other words, the things whose interrelated definitions and applications to auditory phenomena are just what constitutes our *making music of those phenomena.* Our efforts beyond the point of simple admissibility, then, can be directed to the construction of

a model that makes the *most* music possible out of that thing, by accounting for the *most* instances and kinds of coherence that can be extracted from the data-array with the *least* inferential complexity (in the form of elaborate rules of inference based on concepts relatively remote from observables) between the *model* of the data and the observable data itself, on the one hand, and between the model of the *data* and the model of the *theory,* on the other (cf. Part I, pp. 17-19).

Thus, it might turn out that the "contextuality" of a piece is in fact sometimes associated with a relatively low degree of coherence in our *best* model of it.[1] This may arise as a consequence of our being unable to come up with, say, a primitive basis whose simplicity is comparable to that (those) available for traditional literatures. And such a complex primitive basis may underlie relatively few higher structural levels beyond itself in our best model, or perhaps the interlevel inferences we are able to make are themselves complex and require the subsumption of relatively many disparate discriminables within one complex generative step.

On the other hand, since every piece is ultimately just one-to-one with its own "system," it might happen that some pieces appear to instantiate systems that, for most of their upper reaches, intersect with those of no other pieces. Isolation of this sort may be due to a virtual exhaustion of the differentiating resources of the system at those higher levels by those single instances, or it may be a result of the non-extensibility of the system's high-level resources to a sufficiently wide range of different "musical events" or "compositional ideas." Or, it may be the case that there are more ambiguities in the system and its modeling of the associated data than seem desirable in a system that one would want to try to transfer to other instances. In any case, the observation will be merely a biographical one in the long run; if what we can "make of" pieces is what they "are," then certain systems are "shared by" *more* pieces than are others, and some are apparently unique to *single* instances.

Here, then, we may consider two possible ways of viewing "problem" pieces: 1) as individuals, or literatures, that are clearly

[1] It follows from our discussion in previous chapters that we are never in a position to speak absolutely in a negative sense about the "incoherence of a piece," only about 1) "the coherence we can ascribe to it," and 2) "our relative incoherence with respect to it."

music but where general syntactic systems, old or new, are not of much help because the syntactical and articulative levels in these pieces seem virtually identified, by which I mean that the "individual pieces," their actual presentation of particularities of projection, *begin* right at or just after the level at which one's basic model for any music terminates, at a point where most traditional pieces are still further constructible in terms of shared or contextual (unshared) reference collections; 2) as individuals representing high-level articulation through elaborate syntactical ascensions which, however, must be uniquely inferred for these individuals, since they are not evidently shared by the members of any literature or any other instance of music.

The acceptance of these two approaches as legitimate analytic possibilities may, if they produce adequate explanatory results, save us from having to construct enormously elaborate systems to "syntacticalize" and make "part of a literature" pieces whose rendering as rather more simplistic varieties of music may actually yield a structure of greater "significant coherence" (see Part II, pp. 56ff.) than anything yielded by those systematically higher-powered efforts. For by sacrificing "number-of-levels" criteria which require for their implementation a "complexity of primitive" characteristic and perhaps also a "high interlevel opacity" characteristic (both of which reduce sharply the *effective* complexity of the resultant structure), we may gain a great deal in lucidity by constructing a simpler, but relatively ambiguity-free model. And in calling some of the music to which a model of this kind seems applicable "motivic," I do mean to suggest a relatively immediate connection between the motivic level—that articulative surface whose correlate in traditional music is normally rather elaborately generated through many intervening levels from a deep-lying referential background—and the assertible background itself. The resultant model might indeed lead one to conclude that the music it modeled was in fact less richly and elaborately coherent music than the best examples of tonal or twelve-tone composition—which might also explain why this music troubled its own composers to the degree that the most accomplished of them abandoned composition for a while to think of a more satisfactory way of going about it, why, too, it had such a relatively brief history, and why it found so few eminent champions in the form of practitioners after the twelve-tone system was developed. On the other

hand, having a model of our kind for "motivic" music not only would confirm that it is in fact reasonable to regard these pieces as music in an intelligibly traditional sense, but that at their relatively few, shallowly generated, levels, they do exhibit individual syntactical and structural characteristics that give us at least a tenuous hold on some individuality for them. Parenthetically, it should be noted that a predictable consequence of shallowness does seem to show up in analyses of such pieces: namely, that the assertible range of functionally unambiguous development is rather narrow, so that the most fully coherent models will tend to be of pieces of relatively limited extent. In longer pieces, the model derivable for an individual segment of the piece will tend to be more maximally coherent on a more atomic basis than the models subsuming several segments, or those of the "total structure," a relationship (among the models) that is relatively "inside-out" by comparison with the situation normally encountered in traditional-systematic music. (How and why such music came to be composed at a time of such apparently high compositional development may become more clearly understandable in the light of a similar re-examination of the music of late tonality, where the extension of the tonal reference appears to result both in a "motivicism" with respect to *local* coherence which is perhaps incompatible, or non-commensurable, or at any rate discontinuous with the tonal global structure, and in a fragmentation of that global structure and even of its larger articulated segments. But this question will be further considered in due course.)

The second of the suggested approaches, in particular, may save us from the necessity of Procrusteanism with respect to some pieces we have cared enough about to be willing to force them into some system or other, often by ignoring certain kinds of evidence that we normally regard as crucial signalogy for the invocation of the particular systematic-model-type involved, and by accepting a degree of interlevel opacity that, especially when it occurs at lower levels, would be decidedly unacceptable to us in an analysis of almost any of the other pieces we have subsumed in that literature. These equivocations produce a rather coarse fit of piece to model that may be to the detriment of the piece or result in an unfortunate weakening of coherence over the whole literature, or both. If we do care enough about the piece, however, it may still be possible to construct a special syntactical model to get the most

out of it; otherwise, we may be content to regard it as a rather coarsely coherent instance of some known system (to save the virtues of the rest of a literature at their maximum virtuousness—this may have been Schenker's Paladinate), and thereby simply resign ourselves to its exclusion from the repertory of Ultimate Musical Masterworks.

3. EXAMPLE I: THE *TRISTAN* PRELUDE

We do, evidently, care enough about *Tristan* to fuss with it a great deal; it has not been notably cooperative, as any even casual student of the literature knows. The most successful attempt I have seen to explain its Prelude by means of the Schenker-model version of tonality is Mitchell [28]. But even there, the amount of direct evidence that is, in one way or another, suppressed—or, better, treated in a highly non-standard way—leaves one feeling that the piece ought to come out looking better than that with respect to the relation between its most prominent features and our most explanatory model; otherwise, perhaps, one oughtn't after all to think so well of it, by comparison to other pieces that manage at least as much tonal subtlety as the *Tristan* Prelude of Mitchell's account with a great deal more compositional grace in the relation they embody between syntactical importance and articulative prominence. And the "A-major" notion of the analysis, with its accompanying virtual non-consideration of one of the most interesting questions about the Prelude, namely that of the structural "meaning" of the G's that end the piece and connect it with the first scene, is at best an explanation of the "concert version" which is not, I believe, the piece that most of us care about. I tend, in fact, to regard the concert version as providing strong intuitive confirmation that the (Schenker) tonal system is *not* the best place to look to find a good way to reconstruct the Prelude itself, whatever Wagner thought. Thus I would rather not hear the Prelude as the piece to which the "concert ending" is an appropriate one, because that piece seems a good deal less interesting to me than the one I believe *Tristan* as a whole, and the Prelude as a significant chunk of it, can be. So among the really important questions that Mitchell's analysis leaves unasked are the following: Is the *Tristan* Prelude part of *Tristan*? And if it is, *how* is it? I will try to suggest some directions from which answers to these questions might be essayed.

Let us consider first some of the "evidence" with which *Tristan* confronts a "naive" observer, let us say one examining it in our own time who hasn't a very good idea of when it was composed. If he knows the "Schenker model" but doesn't consider its invocation in every case a moral imperative (so that for him, something can be "music" on other grounds, and even equally "highly developed" music), how likely is he to find it advantageous in interpreting this evidence? First, he may notice that virtually all the melodic contours in the piece are framed not in triadic fifths or octaves as in most tonal music, but in minor thirds, tritones, or minor sevenths. Triads, the models of sonority for tonal music, even most elaborately elaborated tonal music, appear rarely; in fact, the presented sonorities of the piece more often contain four distinct pitch classes than three; and although a familiar phenomenon, the intervallic conjunction whose homonym is the dominant seventh of tonal music, does occur frequently, its behavior *as* a dominant seventh is consistently curious.[2] Even the big "structural dominant" itself appears (in Mitchell's charts) after a "dominant preparation" that overlaps in the "basic structure" the basic "neighbor-note" prolongation whose "resolution" happens *inside* the initial *tonic* prolongation, which then proceeds directly to the cadence—except that the resolving tonic of that cadence is found only in another piece, the one with the concert ending. Altogether, this seems a pretty confused bit of tonal composition, and our observer is dissatisfied that he has to regard most of its peculiarities as *barriers to* rather than *particularities of* its coherence (in fact he is even sometimes obliged to regard them as things that have to be suppressed altogether in the explanation and hence rendered conceptually non-existent in the contemplation of the piece). And that final G, coming right out of an obvious horizontalization of the first presented multiple-pitch sonority in the Prelude, leaves a disturbing question of just how capricious a composer Wagner could, plausibly, have been.

[2]Of course, any or all of these assertions could be true of a piece which was nevertheless favorably explicable as tonal, even as highly subtle tonal; the choice would depend on whether all the characteristics noted could be generated in a consistent and significant way out of a triadic structure. The question here, however, is just whether their conjunction (and in particular their conjunction as it occurs in *Tristan*) would *predispose* one to conjecture that the Schenker-tonal model was the *obvious* leading model-candidate for the reconstruction of the piece in question. And the appeal of the *results* of its application (in case the answer were "yes") would in any event be the principal motivator of any ultimate *analytic* determination.

For the consistency with which the non-tonal tritone is in fact *the* interval, or *a* prominently articulated interval, of both simultaneity and succession in the *Tristan* Prelude suggests considerably more structural integrity than the tonal analysis reveals. Enough to make a doubter of, at least, our observer—who, still caring enough to try it himself, might decide to begin just by noticing what is actually *presented* as context by the piece, and what more general coherences might be suggested by such a contextual survey of the actual events and successions, undertaken with a minimum of prior structural bias.

Here is one path he might follow:

Consider the very opening of the Prelude. There are presented, initially, two almost exact-transpositionally related fragments separated by intervening silence, followed after a second silence by a third fragment, more complexly related to the first two than they are to each other, the end of which seems to generate a fourth-fragment "transition" to the continuously unfolding "principal section" of the Prelude. An obvious place to start, then, is with the fragments that are minimally differentiated from each other—the first two—to determine something about their internal characteristics, their interrelation, and their totality. If, for the moment, we regard the opening A as an anomaly (although it will soon enough be considered), we may notice the "minor third" parallelism in the "spans" of three of the four registral lines in the opening fragment:

G♯-A-A♯-B
F-E-D♯ - D
B - G♯
(F - E)

with the lowest line cooperating with the second highest one to associate its first two pitches as simultaneity with its last two, as the second from lowest associates the first two of the highest with its last and the last two with its first; the effect of the F-E imitation, moreover, is that the total pitch-class content of the entire three-measure segment (including the A) is also unfolded within just the two-measure subsegment of it consisting of mm. 2—3. The F-E/D♯-D foldover is, moreover, delineated orchestrally by the joint between strings and english horn at the point of crossover; and the exchange between the next-to-lowest line B-G♯ and the

upper-line G♯-B gives the two measures of the two-measure segment their only pitch-class intersection.[2a]

Thus the two-measure segment, mm. 2-3, articulated as the span from first simultaneity to first silence, may be regarded as a partitioned-off unit itself internally partitioned into one-measure segments by the pitch-class intersection exchange of B and G♯, aside from the other "justifications" for this latter partition noted herein. For on examination, this two-measure segment turns out to exhibit some interesting internal symmetries as well: m. 3, in fact, is the exact retrograde inversion of m. 2, when regarded as follows:

(where C = 0)

measure 2	measure 3
8 - - 9	10 - 11
3 - - -	2 - - -
11 - - -	8 - - -
5 - - -	4 - - -

(m. 2: (8 3 11 5), (9 3 11 5) = T0S)
(m. 3: (11 4 8 2), (10 4 8 2) = T7I)

A nicety is that the inner chords are internally symmetrical also: T8S or T2S (9,3) = (11,5)); and T2I or T8I (9,3) = (11,5)) so that the first chord of m. 3 is a transposition of the second chord of m. 2 as well as its inversion (and that the interval of transposition is 1/11 significantly associates with an important transpositional characteristic of our eventual analysis). And, of course, it now emerges that the notoriously "ambiguous" Tristan chord, so elusive or anomalous in most tonal explications of the piece, and the familiar "dominant seventh," so crucial to these same tonal explications, are here just exact, balanced, simple inverses of one another, with very little local evidence to support their consideration as anything but equivalents in this sense. Moreover, these two chords also share a common relation to the complex made up of the pitch classes that determine the spans of all the registrally defined lines:

[2a]The entire pitch-class content of the fragment is still more compactly unfolded in the succession of the two innermost chords (F B D♯ A and E G♯ D A♯) alone; see note 8, below.

G♯ - B
F - D

B - G♯
(F)

namely, D-F-G♯-B; each of the outer chords of the two-measure segment contains just three of its four pitch classes, with one pitch "contrapuntally" displaced by a semitone; for only the D♯ "spoils" the first chord of m. 2, and when it "resolves" to D, the F of the complex is "displaced" to E.[2b]

Now how is *this* framework for hearing this passage supported or weakened by the characteristics resulting from the presence of the other pitch-class elements therein? Here is the pitch-class map that results from the use of D-F-G♯-B as an intervallic model on the basis of which the other pitches are sorted as well:

measure 2	measure 3
B - G♯ - F	D - (B) - (G♯)
A - D♯	
	E - A♯

There are eight distinct pitch classes all together; five distinct ones in m. 2 and five in m. 3. The five in m. 2 include *three* of the four members of the (D F G♯ B) complex, and *two* members of a transposition of it, the two presenting the more determining of the two intervals of the complex, the tritone. The five in m. 3 again include three from the (D F G♯ B) complex (reiterating the G♯-B as noted and exchanging F and D), and also a tritone-related pair from the remaining distinct transposition of the (D F G♯ B) complex. The A at the very opening, then, can be regarded as being like a "voice

[2b]The pair of semitone dyads F-E and D♯-D, articulated both as a sequential succession (F-E-D♯-D) within a voice, and as an imitative superposition (D♯ D)
(F E), may be heard cross-rhythmically as at once a *parallelism* (of commonly descending semitones) and a *complementation* (of inverse (0 3 6 9)-displacement patterns).

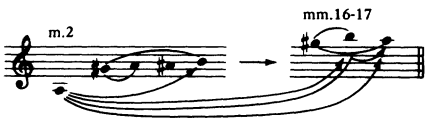
displacement" (to produce a motivic linear contour that is, structurally, "between polyphonic voices"), in which the A "voice-displaces" an F♯, for, as presented, each of the first three pitches of the piece belongs to a distinct one of the three possible (0 3 6 9) complexes, and the tritone-related pitch class of each is present in the ensuing fragment (a subtlety of the substitution is, of course, the contour isolation of the "syntactical" span F-D in the "alto" voice). The articulation of these three pitches is isolated by the simultaneous entrances of all the other voices on the first beat of m. 2, and by the verticalization of the relationship by the F-E in the "bass" of the multilinear complex after the monolinear F-E of m. 1.

The second fragment transposes everything in the first except the opening A (but the B of the opening of the second fragment may be regarded as a long-range realization of the A-B *span* from first (isolated) to last (isolated) pitch of the opening fragment) by the (0 3 6 9)-chordal interval 3. The result is that, naturally, (D F G♯ B) maps into itself, while A-D♯ and E-A♯ map into the pitch classes that *complete* their respective (0 3 6 9) complexes, F♯-C and G-C♯, respectively. Here, B and D are the intersection between the two halves, while F and G♯ are exchanged; and, of course, the number of distinct pitch classes, and the relative number of members of each (0 3 6 9) complex are held invariant:

G♯ - D - B	F - D - B
F♯ - C	
	G - C♯
measure 6	measure 7

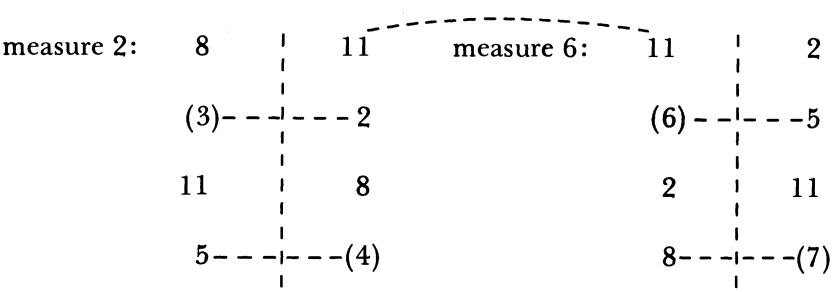
Here, the "displacing" pitches in the Tristan chords are F♯ and G, as before they were D♯ and E. And the appearance of the bass-succession E-G both as a long-range succession in the Prelude and as a local succession at prominent articulative changeover points in it, might be associated with the appearance of those two pitches here as the members of the opening end-point bass-succession. If, moreover, we look ahead to the end of the "introduction," we find not only that the last configuration of the upper line is framed

in E♯-G♯-B, with the G♯-B at the end giving the *whole* upper-line span as a temporally immediate succession of its first to its last pitch classes in the intervallic relation they have as the first and last pitches of the *first* upper-voice span, but we also find that the final A (in the upper voice) associates with G♯ in the same way that those pitches were associated as the first to second pitches of the initial upper-voice span (see Ex. 1), suggesting an analogous G♯-A macrosuccession in the passage as a whole.

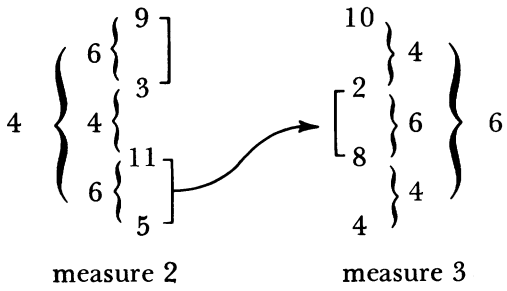


Ex. 1

So we are presented with two sets of eight distinct pitch classes each, partitioned to produce a collection most simply described by reference to the (0 3 6 9) complex. The Tristan chords and their inversional equivalents all contain "neighbor-note" displacements and each contains three elements of a *single* transposition of the (0 3 6 9) complex:



These represent three of the four possible three-out-of-four combinations with respect to the (2 5 8 11) complex, and the fourth [(5 8 2)] appears immediately following them, in m. 10. Also, the inner chords each contain two tritones from different (0 3 6 9) complexes, with the "referential" one [(2 5 8 11)] completing in their union:



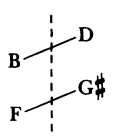
Note the "linear counterpoint" conceit that "inverts" the tritone relations on the model of the way that adjacent fifth-related triads are linearized in their presentation in tonal music and produce "inverted presentations" of their interval content, as:

Here, adjacent 6's separated and spanned by 4's are "inverted" into adjacent 4's separated and spanned by 6's (see example above).

And, by the nature of all these relationships, the union of these two eight-pitch-class groups is the set of all twelve pitch classes, and the four duplicating pitch classes are, of course, the "reference set" (D F G♯ B).[3]

Now the third fragment is not a total intervallic transposition of the first two, although it opens similarly. The first deviation is the addition of a fourth isolated pitch before the first chord attacks, and this is echoed by the "extra" pitch in the upper-voice line.

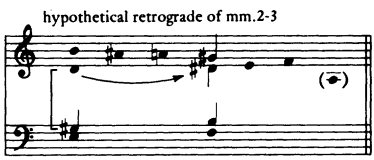
[3]Another respect in which fragment 2 "completes" something initiated in fragment 1 is due to the internal transposition by 3 of the (D F G♯ B)-forming tritones:



measure 2 measure 3

What, our observer considers, do these differences represent with respect to the relationships already determined?

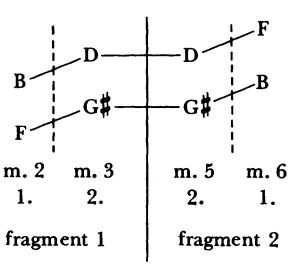
First, in transposing by yet another 3, the pitch-successional areas of fragment 1 are reengaged in different registral voices. Thus the (B-B♭-A-G♯) in the "alto" is the retrograde of the upper voice of mm. 2 and 3; the "tenor" (F-E-D♯) duplicates part of the "alto" voice of mm. 2-3; in fact, the comparison of the passage to an *exact* pitch-class retrograde of mm. 2-3 is interesting both for some striking correspondences and some significant noncorrespondences (see Ex. 2).



Ex. 2

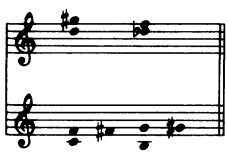
In this passage, especially, the role of A at the opening as a "substitute F♯" is made particularly plausible: the complex E-F(E♯)-F♯ is harmonically associated with an A, the structural significance of which will become clear in the sequel. And in fact, one of the peculiarities of the passage is the G♯-A succession in the "alto" and the E♯-F♯ succession in the upper voice; and we shall return to these as well. Otherwise, note that the Tristan chord of m. 10 is intervallically inverted from the earlier Tristan chords in mm. 2 and 6:

Thus fragment 2, transposing the whole of fragment 1 by 3, *immediately repeats* (D G♯) in its first half, and *arrives at* (F B) in its second half:



	D		G♯
	6		5
measure 10:	G♯	measure 2:	D♯
	F		B
	5		6
	C		F

Actually, of course, the chord in m. 10 is a pitch-class transposition (by 9) of the chord in m. 2; and, although the presentation of the pitch classes that determine the tritone inverts the registral position they would have in an exact interval exchange of this nature (i. e., G♯ would appear *above* D; see Ex. 3 for a hypothetical such construction of the whole fragment), the counterpoint, subtly, does actually produce the C-B "bass" line that would result from such an exact exchange.



Ex. 3

But a content-examination yields even more interesting results; there are, to begin with, *ten* distinct pitch classes rather than eight:

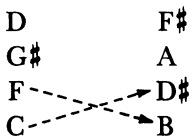
D - F - G♯ - B
A - F♯ - - - D♯ - C
B♭ - - E

And the "chord-area," by itself, presents just nine:

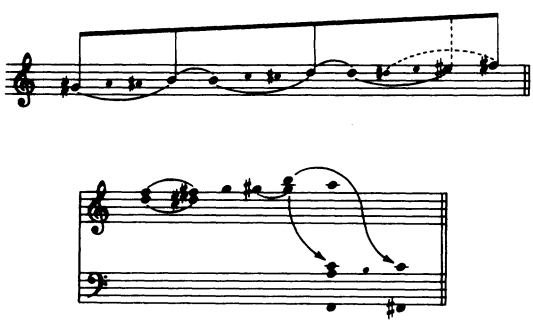
D - G♯ - F - B
E
C - D♯ - F♯ - A

Thus the transposition T1S of (D-F-G♯-B) is given "equal weight" (i. e., representation) with T0S, and in fact the two "outer" chords balance T0S and T1S in just this way, while the upper voice pro-

ceeds *through* the last three of its (0 3 6 9), or the D-F of the overall (G♯-B-D-F), and then goes one semitone "step" further, to the F♯ that belongs to the T1S "neighbor" (0 3 6 9) complex (C D♯ F♯ A):



This progression, in both its immediate and its long-range spans, in fact, yields a view of the Tristan-chord as a *means of interlocking linearly adjacent (0 3 6 9) complexes;* especially since the "upper line" explicitly traces such an interlock between (D F G♯ B) and (D♯ F♯ A C) (see Ex. 4).



Ex. 4

And the procedure observed here is a means of interlock of the same kind throughout the Prelude. The repetition of this "modulatory" fragment in a higher register, followed by isolations of just the two-pitch "fulcrum" of the "modulation" itself, the F-F♯ of the upper line, seem significative in the light of such a background function.[4]

[4]Note, too, how the counterpoint in this fragment projects the *equal weighting,* around the midpoint, of the *two distinct* (0 3 6 9)'s (D F G♯ B) and (D♯ F♯ A C), in contrast to the *single*-chord (D F G♯ B)-weighting of the two preceding fragments:

1) The "spoiling" C in the lower voice of the first Tristan-chord connects with the (A D♯ F♯) of the end-chord to complete T1S, just as the B which displaces that C, spoiling the T1S of the end-chord, completes a (D F G♯ B) with the (D F G♯) of the initial chord; see the arrows in the example, above.

2) The "new" first inner chord (C F G♯ D♯), like its predecessors, equally weights two (0 3 6 9)'s by superimposing an equivalent interval from each; but here the super-

imposition is of two 3's rather than as before of two 6's. The (0 3 6 9)'s so weighted are T0S (F G♯) and T1S (C D♯).

3) In the previous two fragments the balanced halves are disjunct, the first crossing directly into its successor by the immediate juxtaposition of the two inner chords. Here the two inner chords are separated by a "new" midpoint chord (C G♯ E), which alone among the chords of the introduction projects, and equally weights, *all three* possible (0 3 6 9)'s; thus the lone pitch of T2S (E), which occurs in this fragment at this place, functions singularly as the midpoint "extra" pitch of the upper line (regarding which more below), and as the "balancer" of the central chord—a singularity underlined by the "functional-voice" octave doubling it is given, uniquely within the introduction.

4) The inner chord just past the midpoint, through which the fragment passes directly into the new T1S weighting, exactly duplicates the pitch-class content of the first inner chord of the Prelude: (B F A D♯), balancing T0S and T1S, passing *out of* T0S in its first appearance, and passing *into* T1S in its second.

Accordingly, the entire counterpoint may be rendered as follows:

		D G♯	D♯ G♯	E G♯	F A	F♯ A
		F C	F C	E C	D♯ B	D♯ B
no. of	T0S:	3	2	1	2	1
p.c.'s	T1S:	1	2	1	2	3
from	T2S:	0	0	1	0	0

But in the long-range upper-line outline, the F♯ appears, as noted, as the "extra" pitch in this fragment (extending the completion of the third overlapped 3 of a G♯-B-D-F succession by one more semitone: D-F *plus* F♯). This way of constructing the rhythm is nicely supported by the "alto"-voice outline of the entire descending 3 (B-G♯) at the opening of the fragment, so that the "modulatory" A which completes the register in the counterpoint may be regarded as *that* register's "extra" pitch. Hence a sharp, deep-structural cross-rhythm may be observed to unfold across a single line, by regarding that line as referring to, and diverging from, the prior contextual (0 3 6 9) setup at two distinct levels (i. e., in two distinct ways):

Rhythm 1:

	F	(E	G♯ D♯)	(A	A♯) D	B		fragment 1
	G♯	(G	B F♯)	(C	C♯) F	D		fragment 2
B	(B♭	A)	D G♯	(D♯	E)	F [A]	[F♯]	fragment 3

Rhythm 2:

	(F	E)	G♯ D♯	A	/ /	A♯ D	B	fragment 1
	(G♯	G)	B F♯	C	/ /	C♯ F	D	fragment 2
(B	B♭	A)	D G♯ F	D♯	[E] [E]	F A D♯	F♯	fragment 3

The last fragment of the introduction carries this linear-harmonic succession into the passage beginning at m. 17, which by its sharply differentiated (from the preceding) continuity and registral characteristics, "isolates" the opening 16-½ measures *as* a "section," and, by virtue of the continuousness of unfolding thereafter, as an "introduction" (or perhaps an "exposition," since it encompasses the assertion of the central collection (the 3 (03 6 9)'s centered on (D F G♯ B)) and effects a centricization of a secondary construct (C D♯ F♯ A) therein).

In any case, in the final fragment of the introduction, in mm. 16-17, the "modulation" to (C D♯ F♯ A) is "prolonged" through a local return to (D F G♯ B); and the exposure of the pitches F♯, A, C, and E is notable, since their "arpeggiation" as an upper-line succession may be conveniently inferred from the immediately following passage, and can be regarded as constituting the next interlocking linearized Tristan chord (but with *lower-level* structural significance, as will be seen)[4a] (see Exx. 5 and 6).

[4a]Two further inflections: 1) The fourth fragment, like the third, begins with a four-semitone span articulated through a five-*element* succession, overlapping (on F-F♯) with the end of fragment 3. But this, in turn, is overlapped (beginning on G♯) with another four-semitone span, this time articulated through a *four*-element succession. Now the three-semitone spans contained within this latter four-semitone-spanning figure are each unfolded in *three elements;* following which, the next presented four-semitone span (E-F) unfolds in just three elements on *that* model, all in close temporal succession:

D D♯ E F F♯ ⟶ (F F♯) ⟶ F F♯ G G♯ (B) A
G♯ A B C ⟶ C D E

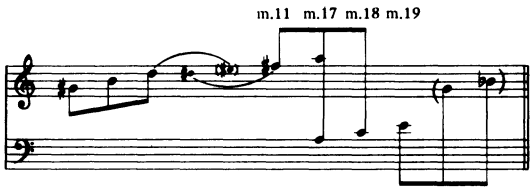
Each of the four-element groups to this point may be regarded as a conjunct pair of trichords, a (0 1 3) trichord plus an inverse thereof.

2) The next four-element group (in register D E F G, foreshadowed by the just preceding biregistral A B C D, in which the double attack on C creates a four-attack framework which the three- and four-element groups inflect variably) also overlaps two 3's, partitioned by a (0 1 3) and an inverse as above; but this group spans a total interval of five semitones:

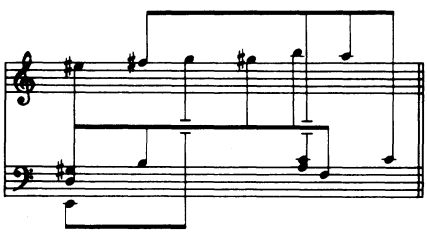
D E F G

Thus to this point can be observed a progression among successive four-element groups consisting of overlapped inverse (0 1 3)-pairs, proceeding "stepwise" from the smallest interval spannable by such a group (three semitones) to the largest possible (five semitones):

G♯ A B	G♯ A B	A B C	D E F
G♯ A♯ B	A B C	B C D	E F G
mm. 2-3	mm. 16-17	m. 17	m. 18



Ex. 5



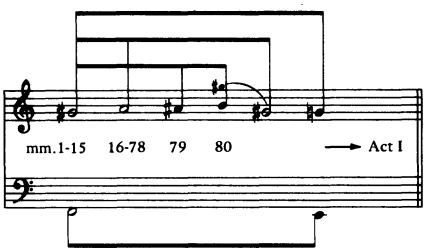
Ex. 6

On the basis of these and further observations on the data of the Prelude as a whole, we might hypothesize, as a data-basis for analytic inferences, a charting of the structure of the Prelude in terms of a simple partitioning of the (twelve) pitch-class "octave" by the (0 3 6 9) construct and its complementary mutually pitch-class exclusive transpositions (1 4 7 10) and (2 5 8 11), regarded as both internally and externally unordered, while using the Tristan-chord connection as the basis for asserting transition among the reference constructs, and "associative" criteria (such as the "phraseological" considerations invoked above) for determining "prolongation"-structure (for determining, that is, on each proposed level, which of the partitioning constructs is to be regarded as *being inflected* by, in turn, which of the others).

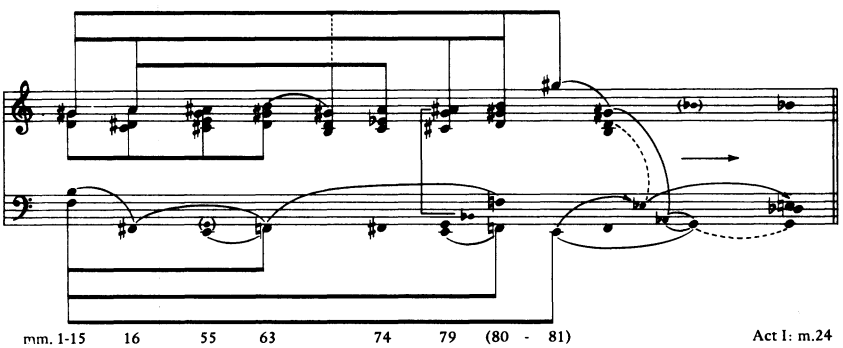
Adopting this (still, let me emphasize, quite weakly determinate) referential model, and deferring for the moment the stickier systematic questions it raises (especially concerning the basis for the "centric" assumption implicit in the (transferred) notion of *prolongation,* and the "order-determinate" implications of the pitch-class content identity of the referential collection with that of the twelve pitch-class octave), we will also adopt a *Grundgestalt* (successional) model to order the "prolongation structure"; here the succession unfolded in the opening chromatic tetrachord G♯-A-

A♯-B will be regarded as the "principal upper voice" for the Prelude as a whole (up to its final "centricization"), and the F-E-(G) succession in the "bass" will be considered as the "structural bass," in which the F-E is regarded as "more background" than the G (which is, again, associated with the final construct-shift). (Here as elsewhere, conceits of tonal *analogy* constantly suggest themselves—as the "center" (0 3 6 9) with its equirelated "subsidiary" transpositions creating the twelve pitch-class octave partitioning set, the "prolongation" notions that this sub-collection hierarchization enables, and the "principal-voice" *Grundgestalt,* all of which can be regarded as a kind of sub-surface counterpoint to the surface conceits of traditional phraseological appearance and traditionally interpretable sonority; but as these are mostly not only fairly transparent but perhaps would tend to confuse perspective at such a tenuous analytic stage, it seems to me preferable to let them drop unmarked in our discourse, as unaffirmed as undenied, to be observed by the reader at his discretion.) A general view of the data of the Prelude grouped according to the (0 3 6 9) partition and the proposed *Grundgestalt* model is offered in Exx. 7 through 10.

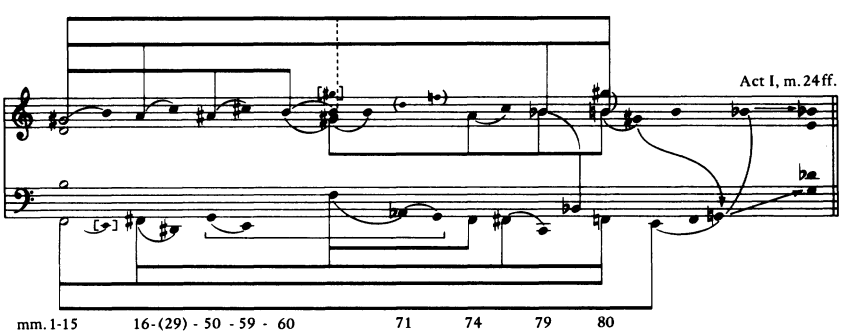
The long "delay" of (C♯ E G B♭) exhibited in Exx. 7 through 10, after several "arrivals" on C♯ (m. 24, m. 44), and then the short duration of the "assertion" of (C♯ E G B♭) from m. 50 to m. 60, and its even shorter duration and more "passing" character at m. 79 is particularly interesting in view of its eventual centricization at the close of the Prelude and its (probable) consequent centrality in Act I (but we haven't yet envisaged a way of regarding the opera beyond the Prelude as interpretable by means of (0 3 6 9) relations). The "harmonic structure" underlying these observations is given in Ex. 10b. Note the "bass line" just before the shift to (C♯ E G B♭) in m. 100: D♭-A-A♭-G—the opening "exposed upper line," in a transposition which is "centered" on the new (0 3 6 9)—namely (C♯ E G B♭)—by virtue of its *not* proceeding the further downward step to F♯ (on the model of m. 2) that would "center" the line analogically on (C E♭ F♯ A); a nice bit of motivic "identity/nonidentity" composition. The B♭ in the middle register over the D♭ assists this interpretation as well. And note also the upper line in mm. 89-90; whereas the parallel passage at the opening (m. 11) has F-F♯, which represents the "T0-T1" (0 3 6 9) succession (i. e., (D F G♯ B)-(D♯-F♯-A-C)), here F-E produces the complementary "T0-T11" succession (D F G♯ B)-(C♯-E-G-B♭). A motivic signifi-



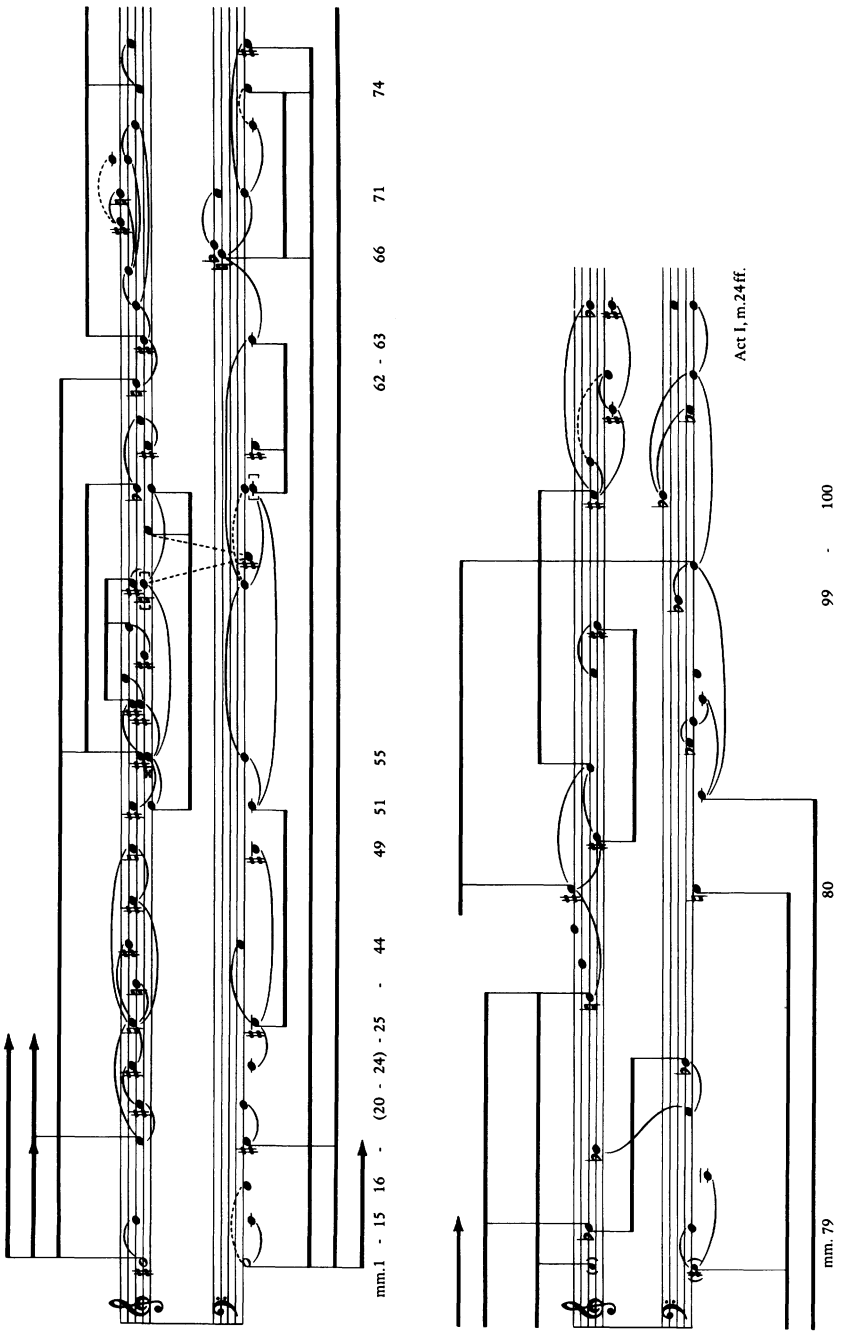
Ex. 7a



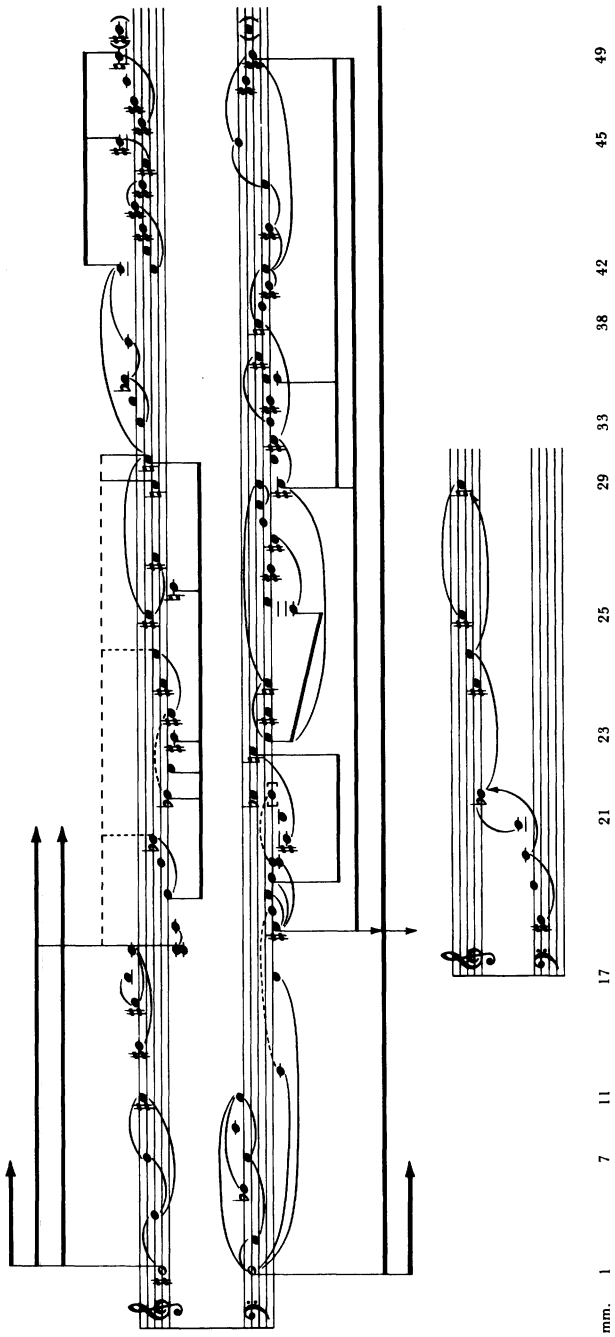
Ex. 7b



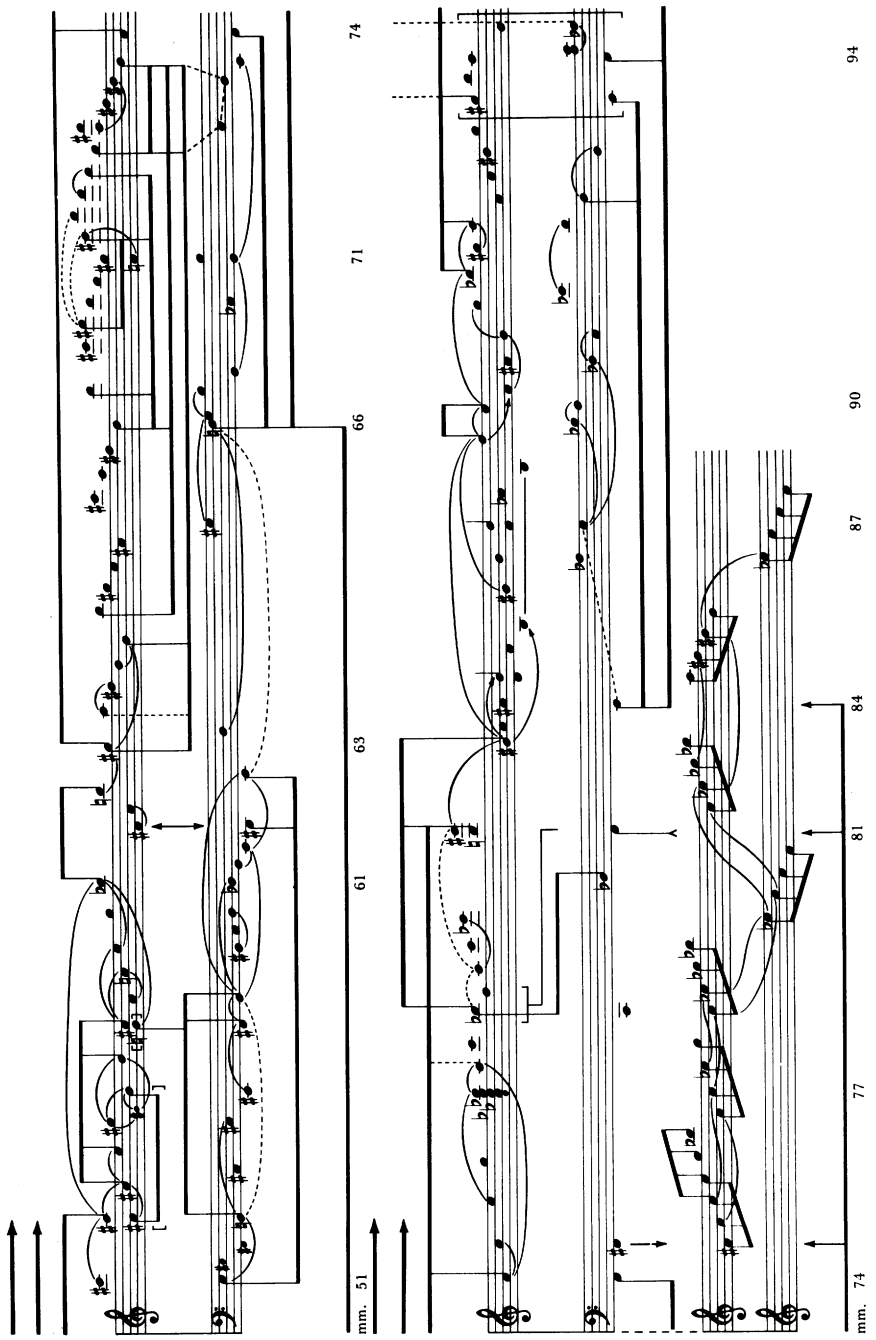
Ex. 8



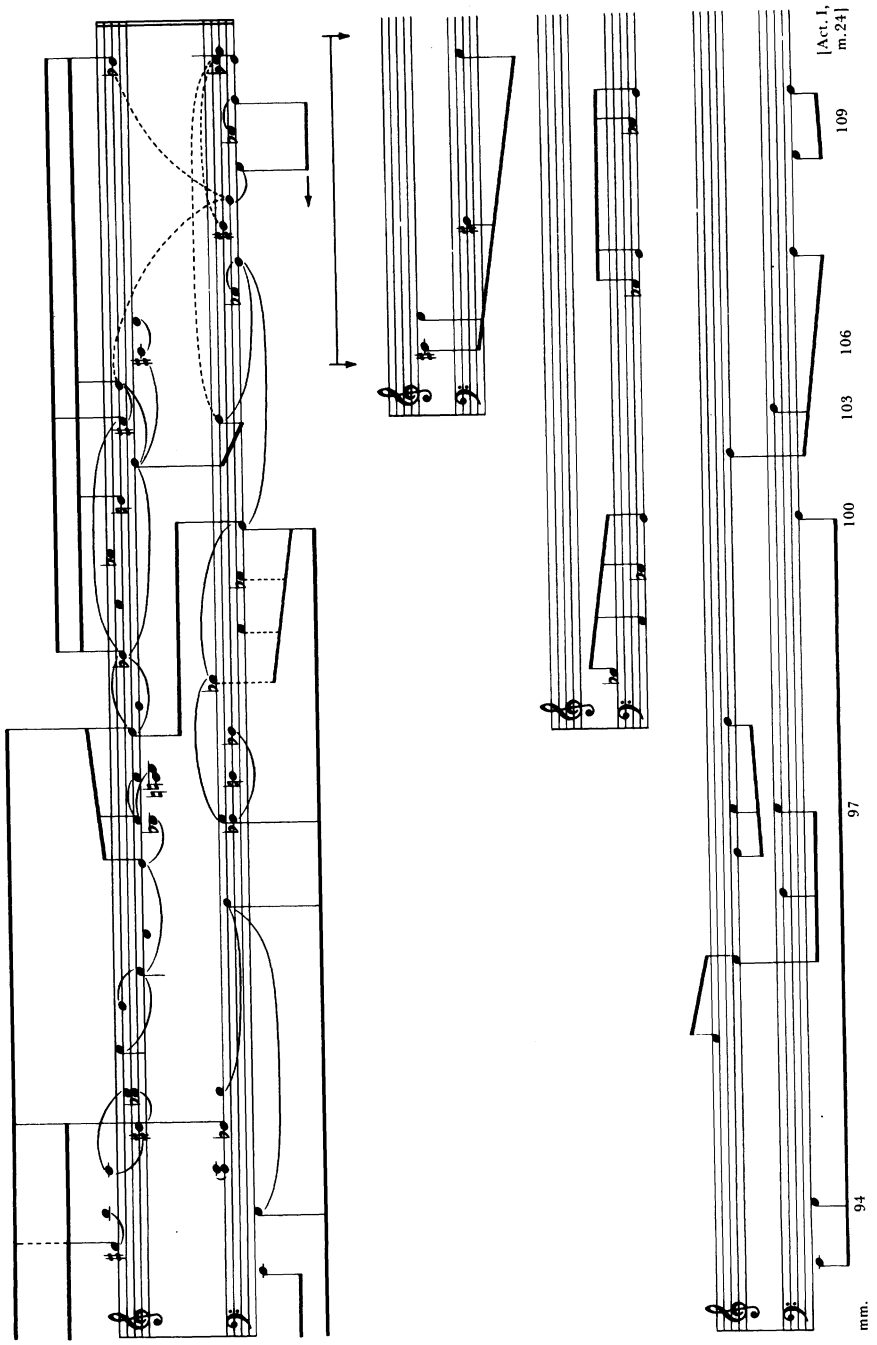
Ex. 9



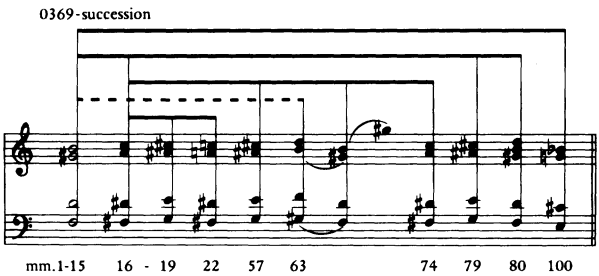
Ex. 10a (beginning)



Ex. 10a (continued)



Ex. 10a (concluded)



Ex. 10b

cance may also be attributed to the transference into the lowest register at the "climactic" passage beginning at m. 79 of the "upper-line" A♯(B♭) to produce a presented "5th"-succession B♭-F. This succession is also projected in m. 97, where the "transition to (E G B♭ C♯)" begins: (D♭ G *B♭ F*), the Tristan chord that opens Act III, here first is succeeded by its inverse (D F G B), then (m. 99) initiates the immediate centricization of (E G B♭ C♯).

Now such a B♭-F succession is, first, a reasonably assertible "framework" for the first bass line of Act II, but, more particularly, it is the directly asserted bass line of the "diatonicized" replication of the opening of the Prelude that opens Act III. There, the convenience of a "tonal" notion of the opera is particularly counter-supported, despite the "triadic-diatonic" surface, by—at least—the long-range relation of this succession to the final one of the opera, on the *6*-related E-B (which is thus also motivically identifiable as a "total transposition," making reasonable an emphasis on the *interval of transposition* (6) as a strong basis of association). Again, we have not yet produced any evidence of relation between the structure or even the referential basis of the Prelude and those of the whole opera, but—assuming we can—it might be revealing to regard the final B as completing a total-opera G♯-B upper-voice/F-B lower-voice span (that adding a B to the Prelude's overall bass produces E-G-B seems potentially explanatory too regarding the last sonorities of the opera), as well as a "total last-segment" (from the beginning of the *Liebestod*) span A♭-B. The *Liebestod* itself in a number of more or less local-successional ways reinforces the feasibility of making such an association. And once again, the two "ends"—here of the Act as before of the "phrase"—exhibit an

analogous combination of transpositional and inversional symmetries (C=0):

opening of Act III: 7 10 1 5 (7 10 1 5) 0 5 8 0 (T0)
1 4 7 11 6 11 (2) 6 (T6)

close of Act III:
4 1 10 6 11 6 3 11 (T9I)

But our account thus far has not, as we have noted several times, given us an adequate way to assign particular function to the sonority-successions that predominate in the opera as a whole, namely "triadic" ones, in a manner preferable to regarding them as directly significant in a "tonal-referential" way; nor, indeed, have we particularized among such sonorities (and all other non-Tristan-chord ones) as they appear in the Prelude itself, beyond subsuming them as "contrapuntal chords" in a larger, defined reference-sonority structure. Thus, to begin with, let us consider the status of such "triadic" configurations in the Prelude. If the (0 3 6 9) construct is a "center," its intervallic structure is thereby the "model for sonority" in the piece (which doesn't mean it need appear as a presented sonority with any particular frequency (a frequent analytic error) but rather that the sonority-structure of the piece can be placed into some sort of consistent and evidently revealing relation to it—as consider those advanced tonal pieces (Chopin, Brahms, etc.) where triads hardly appear at all as presented sonorities but where the most consistent references for what is presented are triadic successions). So the "triad," like the Tristan chord of which it forms a segment, is a "between-construct" relation in the *Tristan* "system," and triads in the Prelude are always "resolved" to literal (0 3 6 9) segments.

As noted, this is particularly emphasized by the almost invariable "interlocked Tristan-chord" framework for linear succession, on the model: 0 4 7 10 1 5 ("ascending") (the harmonic hexachord of our eventual *Tristan* system). But in the opera itself, "triads" appear in much less obviously disposable fashion; and, to be consistent with our insistence on "noticing what's there," can we be as careless in our dismissal of triads as we protested that others have been about (0 3 6 9)'s? Of course, we could regard them as a "conceit"—a historically obvious one, and a particularly nice one, in that one can speak of there having been composed, in the midst of an age of tonal music, a piece in which triads can be regarded as

"dissonant." But further, the conditions of a "system" which has the (0 3 6 9) construct as its generator and model for sonority will also have the problem of the non-uniqueness of transposition, by contrast with the "asymmetric" (0 4 7) partition of tonal-systematic reference, since the (0 3 6 9), transposed by any of its own intervals (3,6,9), yields the identical pitch set as well as the identical interval set. So the "triadic" configurations in the opera could be regarded as a plausible expedient to articulate such otherwise indistinguishable transpositions by means of a "mixed system" in which the (0 3 6 9) would provide the "model for transposition," and the triad (whose twelve transpositions and their twelve inversions *are* content-distinct), the differential pitch-content "identity" of the transpositional level involved—again, the particular appropriateness of the "triad" to this task might still have to be mostly the force of its associative familiarity in the ear of the contemporary beholder. But, to regard its function in terms of a "given" of this kind would seem to entail a serious net sacrifice in the "coherence"-producing power of the new system, by comparison with tonality itself; and this alone might justify strenuous efforts, however awkward, to reclaim the opera for tonality after all. On the other hand, such a flaw might be adduced as a reasonable explanation of "why" *Tristan is* a unique piece of its type, why it had no obvious consequences in the sense of a literature (rather than a surface progeny) of "(0 3 6 9) pieces."

A solution, however, seems to me to be available that is rather less superficial than the foregoing might predispose one to expect. Through it, in fact, not only can "triads" be generated as *integral* consequences of the systematic construction, but they can be considered an indispensable component thereof; for they may be regarded as the *minimum* (in dimension) pitch configurations that arise as *constructs uniquely identifying* "positions" on a hierarchical transposition cycle,[5] whose totality (as interlocked or adjoined

[5]That is, a cyclic ordering of the transpositions of the elements of a system that are taken as *syntactically* hierarchized, against which the particular transposition cycles of given musical *structures* are measured. Thus, in the tonal system, the 7-cycle is the syntactical transposition cycle for *single pitch elements, triads,* and *diatonic collections.* Because of the internal transpositionally self-reproducing symmetry of the (0 3 6 9) construct, the normative *interval of transposition* in a (0 3 6 9) system cannot be an interval contained in (0 3 6 9) itself (i. e., neither 3 nor 6); hence, the syntactical "transposition cycles" of the (0 3 6 9) system are cycles of constructs and of collections, not of single pitches.

on that transposition-cyclic chain), *exhausts* the pitch elements of the system.[6]

To see how this may be, let us now consider those "systematic" questions that were earlier deferred. What, up to here, have we produced by way of a "syntactical reference"? Essentially, a "twelve-pitch-class system" where the twelve pitch classes are "normatively" partitioned by the (0 3 6 9) construct and its mutually content-exclusive complementary transpositions (1 4 7 10) and (2 5 8 11). On the sub-collectional level, the constructs are content-differentiated—hence the possibility of our "centric" map of the Prelude, where the constructs are hierarchized "articulatively" by such characteristics as pitch-class "weighting," contour shaping, etc. But at the "collection" level, no such "centricity" is available, on two grounds: first, that a *single whole collection* encompasses all members of the twelve pitch-class octave, and hence no transposition of it is *content-distinguishable* from any other; and second, that the *constructs within the collection* (the (0 3 6 9)'s) are themselves *internally symmetrical,* and hence simply map into each other or themselves under every transposition; that is, the symmetrical nature of the (0 3 6 9) construct guarantees the content-identity of any transposition by any internal interval, while transposition by any other interval merely reproduces the content of one of the other two such constructs already content-identified in the reference collection. In either case, all transpositions are non-unique with respect to content-identity, in the second case at the *collection,* and in the first at the *construct,* level. So, unless we wish to regard the single (0 3 6 9) as "the" reference *collection,* of which a single-functioned representation of each member of the twelve pitch-class octave is the maximal transpositional extension (which would drastically curtail the complexity-coherence extension through which we have hoped to keep *Tristan* compositionally respectable), we have to commit ourselves to a "reference collection" containing all the twelve available pitch classes in our "octave"; and in that case, content-determinacy *cannot* extend beyond the sub-collectional, construct level. In other words, at the reference-collectional level itself (or themselves—the levels, that is,

[6]Thus, the dyadic construct (0 4) is equally unambiguous in position-reference on the (0 3 6 9) transposition cycle, but its compositions (whether conjoined or adjoined) cannot exhaust the twelve pitch-class octave, and hence it is unsuitable as a "harmonic" construct for a (0 3 6 9)-systematic composition.

at which the sets being compared are dimensionally equivalent to the maximal reference set rather than to any proper subset of it), content cannot be the functional determinant inferred as syntactical (rather than articulative). So *ordering,* of some kind, *must* be (there exists no third alternative). Yet the *time* order of elements seems plainly *not* a convenient determinant for any kind of syntactical coherence in the *Tristan* Prelude, let alone for the opera as a whole. Thus, we are confronted with the question of how and what kind of order can be so regarded (as, that is, such a determinant). Now the problem, as we have noted, is heightened when the extension of the "collections" by transposition is projected, since not only the "whole collection" but also its internal (0 3 6 9)'s display no content-unique characteristics; for even though the "content" of each construct is determinate within a single collection, every transposition of the whole collection merely reproduces the same construct, as well as the same collection, pitch content. So, again, without an order-referential basis, no transposition of a construct is distinguishable from any of the other (content-identical) ones.

But a non-time-dependent ordering criterion is, in fact, an integral constituent in our traditional consideration of all music. The peculiar identity of a presented triad in tonal music is determined not only by pitch-class content, but also by such observations as the relative placement of the constituent pitches, particularly which of the functionally defined elements appears in the lowest register—i. e., by observations of *registral order* (and note that this is more to the *structural* side of our observational hierarchy in tonal music than the more *articulative* matter of the time-order of unfolding of a triadic complex). Evidently, we assume pretty fundamentally a capacity to discriminate the "bottom-to-top" locations of all the elements of a presented pitch complex, which, then, gives us a kind of "ordering" as unambiguously assertible as temporal ordering, and quite independently variable.

Now if such a registral layering as presented in a given piece were itself the actual syntactical determinant in question here, it would considerably reduce the articulative-level resources available to our (0 3 6 9)-systematic reconstruction. And in any case, no observations on the data of *Tristan* seem to point toward the fruitfulness of any such drastic revision of a presentational surface function as a background one *as well.* What, then, might a "syntactical

registral ordering" consist of? To answer this, let us first consider an analogy to "voice leading" in its syntactical and in its presentational senses, where, e. g., a *functionally defined* "upper neighbor" may perform its function unambiguously although presentationally actually appearing "below" its "reference." In other words, some identifying characteristics are regardable as establishing a *syntactical* upper-neighborness *independently* of the articulative unfolding. Thus, similarly, we would wish to establish a *defined syntactical registral ordering* of the member pitch *classes* of the entire (twelve pitch-class) referential collection of the (0 3 6 9) system, such an ordering being taken to identify the *referential transposition* of the collection (and, of course, hence of its internal (0 3 6 9) partitioning constructs and of their interiors). Now the construct-transformations in the tonal system that retain but registrally permute pitch content are the registral-interval-order-distinct (but content-identical) "inversions" of triads; and thus such transformations function as construct-level distinctions within collections. But since what such "inversions" would produce in the (0 3 6 9) system are constructs that, even if "ordered," would be identical with the constructs resulting from given *total transpositions* of the collection (that is, transpositions and permutational "inversions" of the (0 3 6 9)'s would not be *interval-order* distinct from one another at all), the level at which this consideration operates effectively is that of the *reference collection* (a deep-syntactical level) rather than that of the *construct* (a relatively more articulative level). Thus, a complete unfolding of the (0 3 6 9)-systematic transposition cycle produces a *multiple* partitioning (exhaustion) of the pitch-class octave, a partitioning in which each construct is *internally* pitch-*class ordered,* and in which all the resultant constructs are consecutively ordered, in both cases by means of such a "syntactical registral" ordering criterion. And precisely because no new interior content is produced by transposition in either the constructs or the collections, its (transposition's) function as a *syntactical-order* determinant may be unambiguously inferred.

Let us see how the system can be constructed along such lines, and how the *contents* of those maverick (non-(0 3 6 9)) sonorities can be considered the *crucial* means for creating the requisite functionally unambiguous *order* identity independent of presented register or even presented registral order. First, the generating partition is the symmetric "interval-halving" one, represented at the

first partitioning level by the half-octave interval 6 (in appropriate contrast to the asymmetrical tonal 7); this symmetry, as we have noted, underlies many of the special characteristics of the system's transposition cycle—which as we have also noted is to be regarded as primarily a "cycle of constructs" rather than one of single intervals (which accounts for the disparity of the "intervals *within*" the construct and those "between" the construct and its transpositions). This is necessarily so because neither of the generating-interval cycles of the (0 3 6 9) exhausts 12. Moreover, since the collection itself is to contain all the available pitch-class elements, *any* interval not internal to the (0 3 6 9) may be regarded as the "collection" generating one that defines "between-construct" relations, especially since "polyphony" (i. e., relations within and between voices *of* the constructs) is *identified* with the "model of whole-*construct* succession" itself in the (0 3 6 9) system (rather than with a particular *pitch*-successional model *as well,* as in the tonal-systematic *Ursatz*). And complementary transpositions, as (T1+T11); (T2+T10); (T4+T8); or (T5+T7); or indeed transpositions by any two distinct non-(0 3 6 9) contained intervals not 3- or 6-related, will produce the same (content-identical) partitioning-construct (0 3 6 9) characteristics as any other. We, however, choose the (T4+T8) transposition as our *basis,* to account for the role of the Tristan chord as the principal articulator of (0 3 6 9) succession, since 4 is the interval that separates the "top" one of the three 3- and 6-related pitches of the "base" (0 3 6 9) from the "displacing" pitch (as, $\overset{\lceil\quad\rceil}{2\ 5\ \underset{\lfloor\ \rfloor}{8}\ 0}$ (3 6 . . .)). Here is the initial octave partition, on the model of our construction of the diatonic collection in Part III.

1. Symmetrical octave partition, transposition, and complementary transposition:

		4
	0	
8		10
	6	
2		4
	0	
8		

The "half-octaves" thus defined are partitioned analogously, i. e., in halves, to produce an entire (0 3 6 9)-generated collection containing all twelve pitch classes:

2.

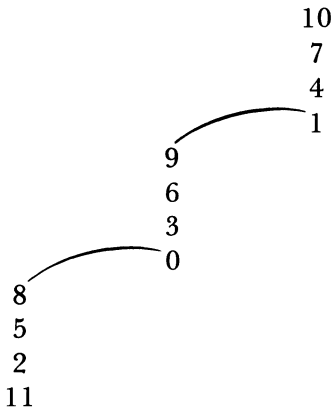
```
                    (8)
                4
            0       (5)
        8       1
            9       (2)
        5       10
            6       (11)
        2       7
            3       (8)
        11      4
            0
        8
(4)
```

The above may be regarded as a "harmonic" model of the partitioning, while the following represents a "polyphonic" (linear-interval) model, or "order" model:

3.

```
(7)   8  9  10 (11)
      5  6  7
      2  3  4
(10)  11 0  1   (2)
```

Now the "order" model may be regarded as joining "adjacent" (0 3 6 9)'s through the Tristan chord; the "common-tone" connection of analogously adjacent triads (e. g., IV-I-V) in the tonal-collectional model is replaced here by the *disjunct* "non-common-tone" connection, which is compositionally projected by the Tristan chord, the (0 3 7 10) chord, the (0 3 7) chord, and the dyads (0,1), (0,4), and (0,5) (and their complements). By means of the Tristan-chord connection, we may represent the "order" model as follows:

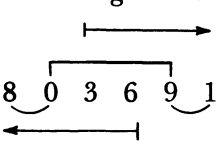


which incorporates our "ordering" criterion in *pitch-class* terms, a matter of indifference in the derivation of the exclusively content-determinate tonal syntax. (Note also, in connection with the "4"-connected model above that a 1, 2, 4, 5, 7, or 8-connected model would have provided an equally unambiguous "interlock" chord in place of the Tristan chord of *Tristan* (which also indicates non-triviality for *its* appearance in an (0 3 6 9)-systematic piece).

Thus, whereas our present model yields (2 5 8 0) as the (lowest) interlocking four-pitch adjacency, a 1-connected model would yield (2 5 8 9), an 11-connected one (2 5 8 7), and an 8-connected one (2 5 8 4). This is, in fact, an exhaustive list (to within inversion), since (0 3 6 9) arrays whose intervals of connection are 6-complementary to one another yield *equivalent* four-pitch interlock chords: both the 4-connected and the 2-connected models produce Tristan chords and dominant sevenths as interlock chords; Tristan chords always associate their "center" (0 3 6 9) with its 1-related transpose; and dominant sevenths always lean to the 11-related side—though the "ascending" and "descending" order positions are reversed in the two systems:

4-connected system:

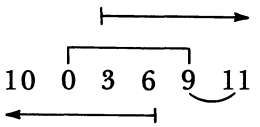
ascending T1-wards: Tristan chord



dominant seventh: descending T11-wards

2-connected system:

ascending T11-wards: dominant seventh



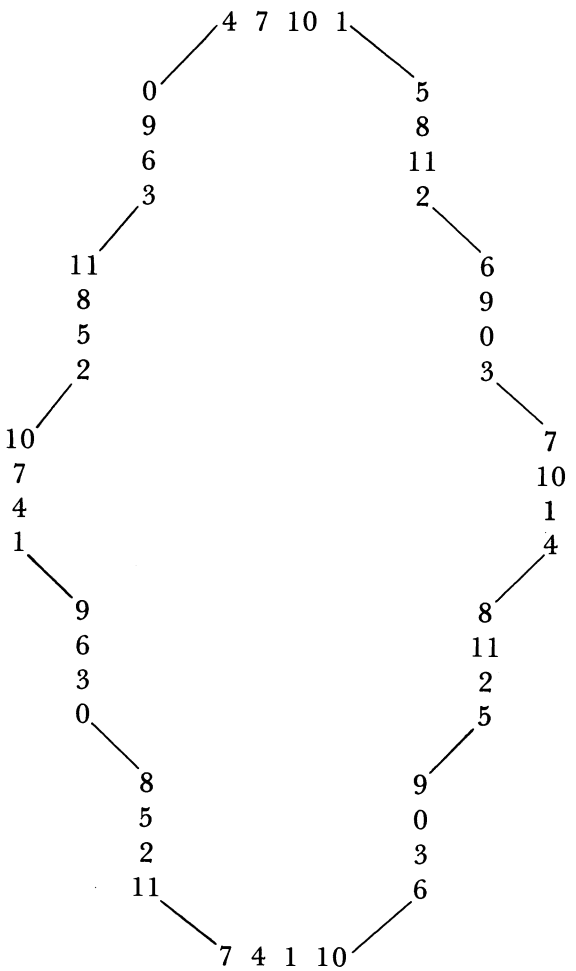
Tristan chord: descending T1-wards

That the distinction between the two systems is more than metaphorical, however, is observable from the difference in content of interlock segments of the *three-note* variety: whereas they are *triads* in the 4-connected system, they are (0 2 5/0 3 5) chords in the 2-connected one; so that the three-note interlock chords in the array more uniquely identify the system than do the four- (or more) note ones, yet they do so with no less internal selectivity: just as the four-note-chord evidence in *Tristan* leads us to the 2/4-connected array-family, so the three-note chord evidence would seem to lead us to the 4-connected one in particular. And that the homonym of the *minor* triad is a subset of the Tristan chord, while that of the *major* triad is a subset of the dominant seventh means—with some evident interest for our *Tristan* observations—that the *modality* of a triad in *Tristan*-systematic music is an invariable index of its "modulatory" lean.

But even as one of a number of possible four-element interlock chords, the Tristan chord is not without its own unique strategic advantages. In particular, as the only interlock chord that contains no semitone, it is the only one able to reflect a (0 3 6 9)-member displacement simultaneously in the *harmonic* and the *linear* dimensions, insofar as the note which harmonically displaces a (0 3 6 9) member (as a "next pitch in order" to the whole (0 3 6 9) in the (0 3 6 9) array) also displaces that member linearly (as a "next pitch in order" in the chromatic scale—since successive (0 3 6 9)'s in the array are T1-related). Since no other (0 3 6 9) system can reflect this dual functionality in its interlock chords, it is in at least this respect inferior to the *Tristan* system. And that *Tristan* heavily exploits this particular depth of its system may be inferred from the virtual saturation of the introductory fragments of the Prelude by Tristan-chord-producing semitone inflections.

If we now expand our "order model" to its *maximal* extension, we generate a *chain of (0 3 6 9) transpositions,* which may be sliced into twelve *distinct* twelve pitch-class collections, each with a particular (0 3 6 9) at its "center":

4. Cycle of (0 3 6 9)'s:



Each possible Tristan chord occurs *just once* in this array as a relation amongst pitch classes defined as "syntactically adjacent." Thus each one, relative to any inferred (0 3 6 9) "center," repre-

sents *one and only one* possible "hierarchical position" in the "transpositional cycle," even though the transpositions themselves map every (0 3 6 9) into itself at every third transposition-position, and every three consecutive (0 3 6 9)'s into the twelve pitch-class set. Thus there are just 24 possible Tristan chords; every other four-pitch-class adjacency is either a (0 3 6 9) or a (0 3 7 10) (the latter being the relation between adjacent "half-constructs"—concerning which see below). Since the (0 3 7 10)'s (unlike the Tristan chords), invert into themselves, there are just twelve of them—like the number of distinct (0 3 6 9) transpositions; but unlike the (0 3 6 9)'s, *no two are content-identical.* Thus, with the Tristan chord and the (0 3 7 10) construct, we have secured an unambiguous "syntactical order" identification within our array by means of the *content* they project as subsidiary, "between-construct" constructs.

Here are the twelve distinct (0 3 7 10)'s, in "order":

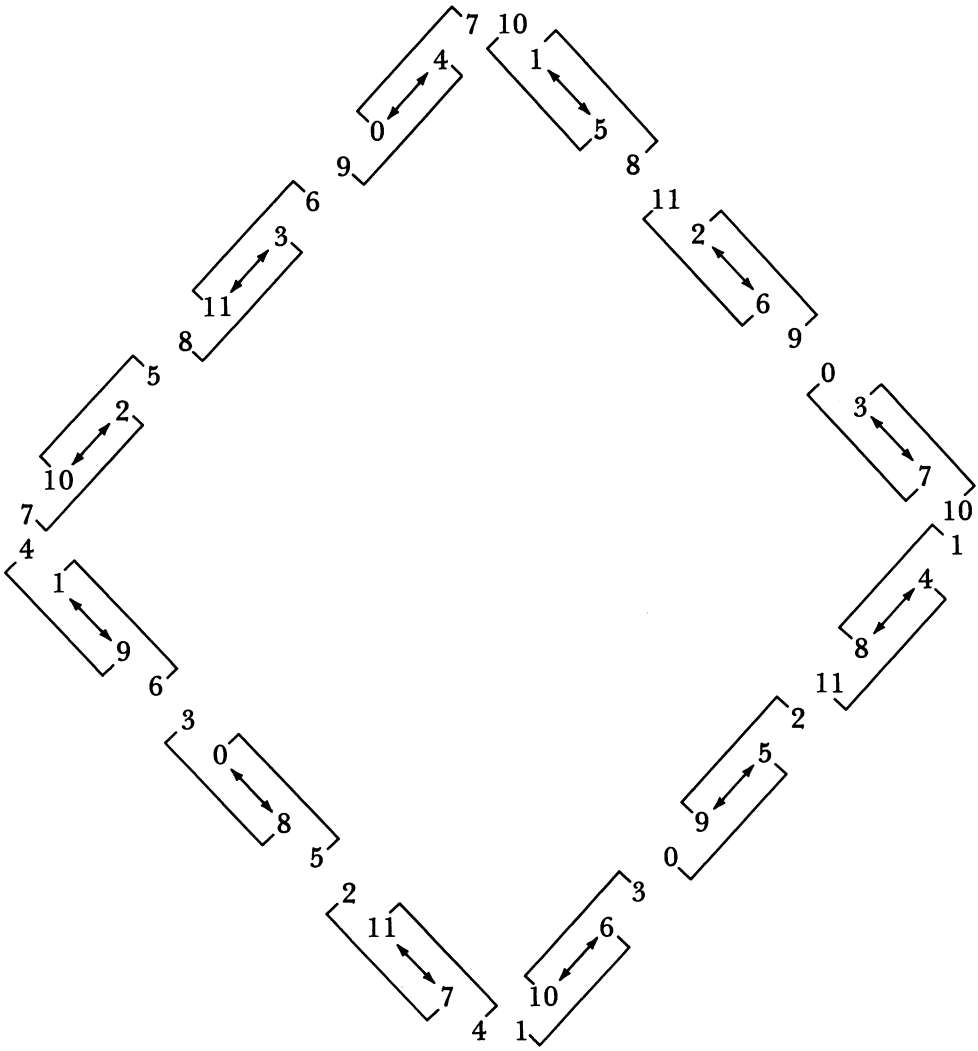
(4 7 11 2) / (5 8 0 3) / (6 9 1 4) / (7 10 2 5) / (8 11 3 6) /

(9 0 4 7) / (10 1 5 8) / (11 2 6 9) / (0 3 7 10) / (1 4 8 11) /

(2 5 9 0) / (3 6 10 1)

But then, on examining the "interiors" of these (0 3 7 10)'s, we find the heart of the "triad" matter as well: for the interlocking 12 (0 3 7 10)'s produce, by virtue of their partitionability as two "overlapping triads" each, {(0 3 7), (3 7 10)}, just the 24 possible distinct "triads" (and like the Tristan chords, but unlike the (0 3 7 10) chords, "biassed" toward *particular* (0 3 6 9)'s by their "weighted" content); but of course they are generated in a hierarchical order that has nothing to do with "tonal transposition," yet is totally unambiguous in fixing the identity of a particular position in a particular (0 3 6 9) transposition cycle, since each occurs uniquely in its defined position:

> 5. How "triads" arise in the (0 3 6 9) system. Exactly twelve transpositional forms of the (0 3 6 9) construct produce the following chain; triads are outlined by brackets:



Inside brackets = "minor triads"
Outside brackets = "major triads"[6b]

[6b]A psychoacoustic, or ear-training, demonstration may be interesting here: compare the experiential "feel" of successions of pairs of triads represented as adjacent in Figure 5 as screened tonally, by the cycle of fifths:

G B♭ D A C♯ E

with that of the "same" triads as screened by the *Tristan*-systematic (0 3 6 9) array:

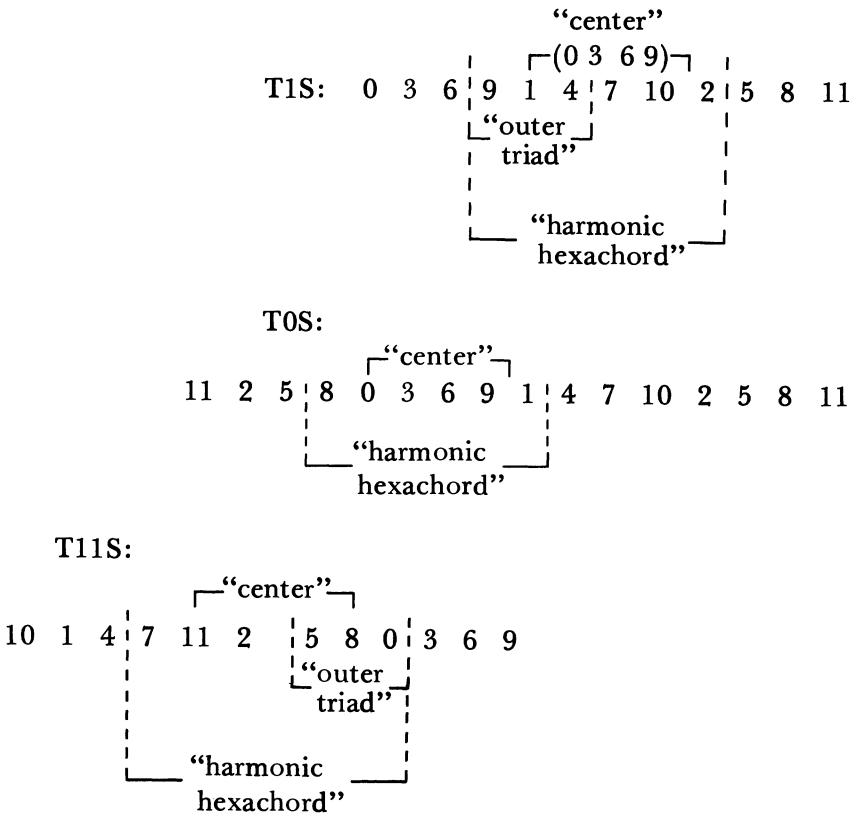
A C♯ E G B♭ D

In our "centric" interpretation of the *Tristan* Prelude, each passage is regarded as "centered on" a given one of the three (pitch-class) (0 3 6 9)'s, with the others present as locally subsidiary "members" of the polyphonic "voices" defined by the "center" (0 3 6 9). Now it turns out that if any one group of three consecutive (0 3 6 9)'s from our "cycle of (0 3 6 9)'s" is regarded as such a referential partitioning, with the (0 3 6 9) at its "center" taken as the "referent" for its "polyphony," then *all* the content-identified "order" relationships obtainable within such a set are obtainable from just the "*center*" *hexachord* of that set; i. e., the "center" (0 3 6 9) plus the nearest member of each "subsidiary" (0 3 6 9). This is the configuration called "the harmonic hexachord" above:

(1) {11 2 5 [8 0 3 6 9 1] 4 7 10}

"harmonic hexachord"

Note that this hexachord is distinguishable as the segment consisting just of the two *disjunct adjacent* "triads" represented in a *single* such set (i. e., as partitioned off from the rest of the "cycle of (0 3 6 9)'s"). And note, too, that moving to either of the *other* triads exhibited within the single set produces a subset of the "harmonic hexachord" of a *different* (0 3 6 9) set, one whose *center* is either one or the other of the "outer" constructs of the original set—hence, one related to the original as one of two complementary transpositions of it, either "T1" or "T11." The analogy to "tonal transposition" by 7 and 5 is interesting: in our example, the two "other" triads are (5 8 0) and (9 1 4). If the set labeled "(1)" is called "T0S," a transposition-cycle segment including T0S, T1S, and T11S may be represented as follows:



As in tonal transposition by 5 and 7, the representations of the "tonic" in these three transpositions "exhaust" the three "principal-construct functions" exhibited in any *one* of them (on the IV, I, V model). But in particular, each transposition is uniquely characterized by its disjunct-adjacent triad pair (and indeed by *each triad* as its "representative"), which enables the *invocation* of the complete twelve-pitch-class reference, with its unique *ordering* of (0 3 6 9)'s respectively and internally, without a complete presentational statement of that reference—simply, in fact, on the basis of the actual presence of as few as *three* pitches. Thus each triad not only represents a unique position on the (0 3 6 9) transposition cycle, but also identifies uniquely a particular 3-(0 3 6 9) set, with a "center" (0 3 6 9) that may be regarded as "generative" on the tonal-systematic model without necessitating any crossing of the "order"-"content"-reference barrier.

Similarly, all the remaining significant "harmonies" of *Tristan,* including the Tristan chord, are derivable from relations on this harmonic hexachord, sometimes uniquely identifying a single reference set, sometimes associating two determinate reference sets. The latter function, a characteristic notably of the "symmetrical" (0 6 2 8) chord, is particularly significant in our "set-structural" analysis below. For the two measures of the "first phrase" of the Prelude are "balanced" between the T0S set and the T6S set that lies "halfway around" the (0 3 6 9) set transposition cycle, a characteristic determined for those two measures by their component Tristan chords ((F G♯ B D♯) in m. 2; (E G♯ B D) in m. 3). But the "symmetrical" chords at the "crossover" between the two measures discussed above *both* arise *uniquely* from the *conjunction* of T0S and T6S (see Table 10, below).

Here is a model of the entire set-transposition cycle, followed by a model of the transposition cycle of the set-identifying harmonic hexachords alone. I give both "T" and "I" numbers here, corresponding to "0 3 6 9-step distances on the 'cycle'"; but note that while, where "T" is concerned, this purely "order"-based tabulation gives the same subscript identity as would the corresponding "pitch-class" tabulation, the "I" numbers resulting from complementary order transpositions with respect to the given "T" numbers are, in fact, the mod-12 complements of their pitch-class-operational equivalents. For contextual reasons, I regard the transposition cycle as a "revolving" juxtaposition of two "complementary" cycles whose "0"-positions are "T6"-related sets:

6. Hierarchical (0 3 6 9)-set "S" and "I" Transposition Cycle (the "TnS" succession may be thought of as an "ascending," and the "TnI" succession as a "descending," reading of the (0 3 6 9) cycle given in Table 4):

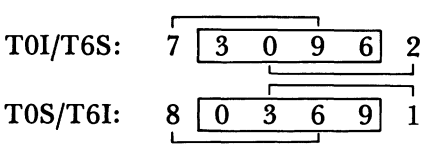
S →			I ←
T0S:	(11 2 5 8)(0 3 6 9)(1 4 7 10)	:	T6I
T1S:	(0 3 6 9)(1 4 7 10)(2 5 8 11)	:	T5I
T2S:	(1 4 7 10)(2 5 8 11)(3 6 9 0)	:	T4I
T3S:	(2 5 8 11)(3 6 9 0)(4 7 10 1)	:	T3I
T4S:	(3 6 9 0)(4 7 10 1)(5 8 11 2)	:	T2I

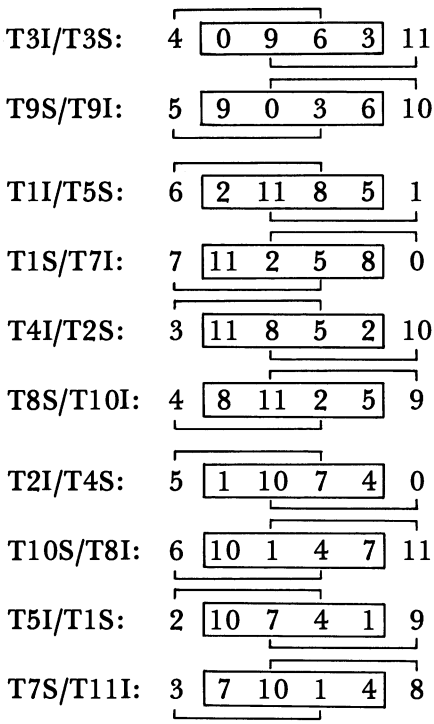
T5S:	(4 7 10 1)(5 8 11 2)(6 9 0 3)	:	T1I
T6S:	(5 8 11 2)(6 9 0 3)(7 10 1 4)	:	T0I
T7S:	(6 9 0 3)(7 10 1 4)(8 11 2 5)	:	T11I
T8S:	(7 10 1 4)(8 11 2 5)(9 0 3 6)	:	T10I
T9S:	(8 11 2 5)(9 0 3 6)(10 1 4 7)	:	T9I
T10S:	(9 0 3 6)(10 1 4 7)(11 2 5 8)	:	T8I
T11S:	(10 1 4 7)(11 2 5 8)(0 3 6 9)	:	T7I

7. Hierarchical harmonic hexachord "S" and "I" Transposition Cycle:

S →			I ←
T0S:	(8 0 3)(6 9 1)	:	T6I
T1S:	(9 1 4)(7 10 2)	:	T5I
T2S:	(10 2 5)(8 11 3)	:	T4I
T3S:	(11 3 6)(9 0 4)	:	T3I
T4S:	(0 4 7)(10 1 5)	:	T2I
T5S:	(1 5 8)(11 2 6)	:	T1I
T6S:	(2 6 9)(0 3 7)	:	T0I
T7S:	(3 7 10)(1 4 8)	:	T11I
T8S:	(4 8 11)(2 5 9)	:	T10I
T9S:	(5 9 0)(3 6 10)	:	T9I
T10S:	(6 10 1)(4 7 11)	:	T8I
T11S:	(7 11 2)(5 8 0)	:	T7I

8. Tristan-Chord Distribution:





9. (0 3 7 10)—Chord Distribution:

T0I+T1I:	9	6	2	11
T0S+T11S:	0	3	7	10
T1I+T2I:	8	5	1	10
T11S+T10S:	1	4	8	11
T2I+T3I:	7	4	0	9
T10S+T9S:	2	5	9	0
T3I+T4I:	6	3	11	8
T9S+T8S:	3	6	10	1
T4I+T5I:	5	2	10	7
T8S+T7S:	4	7	11	2
T5I+T6I:	4	1	9	6
T7S+T6S:	5	8	0	3

10. The (0 6 2 8) chord (generated as a relation between outer dyads of T6-related harmonic hexachords; the (0 6 2 8) results from the conjunction of the dyads at *corresponding* "outer" ends; the *opposite* outer-end conjunction produces the (0 4 7 11) chord which appears more conspicuously in the opera itself (e. g., the chord that opens Act II) than in the Prelude to Act I):[7]

A. Generating Relation:

T0 S:	8 0	3 6	9 1
T6 S:	2 6	9 0	3 7
Resultants:	0	0	0
	2	3	2
	6	6	6
	8	9	8

(The relation between (0 2 6 8) and (1 3 7 9) in this example is the same, pitch-transformationally, as that between the two (0 2 6 8)-type chords at the last eighth of m. 2 and the first beat of m. 3 of the Prelude to Act I.)

B. The (0 2 6 8) Chord Array:

T0S/T6I:	8 0	3 6	9 1
T6S/T0I:	2 6	9 0	3 7
T3S/T3I:	11 3	6 9	0 4
T9S/T9I:	5 9	0 3	6 10
T5S/T1I:	1 5	8 11	2 6
T11S/T7I:	7 11	2 5	8 0
T8S/T10I:	4 8	11 2	5 9
T2S/T4I:	10 2	5 8	11 3

[7]Significantly (0 4 7 11) may be regarded as in a special sense an *inverse* of (0 3 7 10), insofar as both may be regarded as determined by an overlapped (0 3 7)/(0 4 7) pair, which in the (0 3 7 10) emerges from a configuration of two 3's "surrounding" a 4, and in the (0 4 7 11) emerges from two 4's surrounding a 3.

T4S/T2I:	0	4	7	10	1	5
T10S/T8I:	6	10	1	4	7	11
T7S/T11I:	3	7	10	1	4	8
T1S/T5I:	9	1	4	7	10	2

In the above table, each (0 2 6 8)-chord occurs twice, but no pairs of (0 2 6 8)-chords occurring in a given hexachord-pair conjunction recur together in any other hexachord-pair conjunction. Each "side" of the list contains just one occurrence of each transposition of the (0 2 6 8) chord:

0	2	6	8	=	T0(T6)		T1(T7)	=	1	3	7	9
9	11	3	5	=	T9(T3)		T4(T10)	=	4	6	10	0
5	7	11	1	=	T5(T11)		T0(T6)	=	0	2	6	8
2	4	8	10	=	T2(T8)		T3(T9)	=	3	5	9	11
4	6	10	0	=	T4(T10)		T5(T11)	=	5	7	11	1
1	3	7	9	=	T1(T7)		T2(T8)	=	2	4	8	10

Now none of the above is construable as the "analysis" of anything—in the sense of its integrated construction; rather some promising-looking tools of measurement are offered, as perhaps capable of producing high-level "theoretical data" (by slicing the relatively "observational" data in particular ways), from which analytic construction might fruitfully proceed. Nevertheless, it might be useful to undertake some brief, partial- and quasi-analytic examples to test the plausibility of the thesis that these particular syntactical referents, in application to *Tristan,* would in fact produce something that looked like a significant musical construction. Let us, to begin with, reconsider the introduction of the Prelude (mm. 1-17) from this point of view. On the basis of our previous discussion, we might regard the collection as "centering" on the (D F G♯ B) construct; since the first Tristan chord is (F G♯ B D♯), let us call the (D F G♯ B)-"centric" collection in which that occurs "T0S." This gives further the pitch-class-space partitioning constructed on p. 189 as follows:

T0S: {{(C♯ E G A♯) (D F G♯ B) (D♯ F♯ A C)}
T3S: {(E G A♯ C♯) (F G♯ B D) (F♯ A C D♯)}
T6S: {(G A♯ C♯ E) (G♯ B D F) (A C D♯ F♯)}
T9S: {(A♯ C♯ E G) (B D F G♯) (C D♯ F♯ A)}}

Here the bracketings are determinate not only of (0 3 6 9) orders but of principal twelve-collectional boundaries as well; this is effectuated by a new interpretation superimposed on that of the previously given "open" (0 3 6 9) cycle in which adjacencies are defined only as "within-construct" or "between-construct," while here they are further identified as either "within-collection" or "between-collection" (each collection having thus a unique adjacency-construct-content identity). This is a further "syntactical" distinction at a more "foreground" level than our previous, "open" (and thus more general-systematic) one; our new distinction is just as unambiguously and consistently applicable as the former one, and is compatible with it not only in the sense that it is sustainable without prejudice to the earlier-formulated one, but also in the sense that it is based on a large-scale application of the same (pitch-) transposition principle as was applied, with respect to single pitches, to generate the (0 3 6 9) cycle. (And this "application" of the transposition-by-3 relation to successive twelve-pitch-class *collections* arises naturally as a result of our having created the collections just by slicing the "cycle" as we have done.) This, too, makes meaningful the extension of the cyclic set (T0S), (T3S), (T6S), (T9S) into a complete transpositional complex—since by our new distinction, we have not only been able to create a fourfold *unique* partitioning of the twelve pitch-class octave, but have opened the way to a threefold extension thereof wherein the complete "within-collection"/"between-collection" identification is expanded:

{{T0S T3S T6S T9S}
{T1S T4S T7S T10S}
{T2S T5S T8S T11S}}

in content:

T1S: {(D F G♯ B) (D♯ F♯ A C) (E G A♯ C♯)}
T4S: {(F G♯ B D) (F♯ A C D♯) (G A♯ C♯ E)}
T7S: {(G♯ B D F) (A C D♯ F♯) (A♯ C♯ E G)}
T10S: {(B D F G♯) (C D♯ F♯ A) (C♯ E G A♯)}}

T2S: {(D♯ F♯ A C) (E G A♯ C♯) (F G♯ B D)}
T5S: {(F♯ A C D♯) (G A♯ C♯ E) (G♯ B D F)}
T8S: {(A C D♯ F♯) (A♯ C♯ E G) (B D F G♯)}
T11S: {(C D♯ F♯ A) (C♯ E G A♯) (D F G♯ B)}}

This is a maximal extension of the principle, since none of the systematically defined "harmonic" constructs appears *uniquely* as a "between-cycle" one.

A charting of the sonority successions in the opening measures against this background proceeds from the (F G♯ B D♯) (of T0S) to the "neutral" (F B D♯ A) and (E A♯ D G♯), both equally weighted between T0S and T6S, to, finally, the (E G♯ B D) of m. 3, found in T6S: the "balanced" (T6-related) transposition, "*halfway*" across the partitioning cycle (where, as noted in the charts above, T6S = T0I); while the *construct* shifts to the non-transpositionally equivalent inverse in leaning from the (D♯ F♯ A C) side in m. 2 to the (G A♯ C♯ E) side in m. 3—a neat "structural-level" compositional distinction.

In the second "phrase," the first Tristan chord is (G♯ B D F♯) of T3S, and the last is (G B D F), of T9S, completing the cycle of references at the point where also are completed the twelve pitch-class cycle, the (0 3 6 9)-cycle assertion, and the (D F G♯ B) weighting.

The third "phrase" begins with the Tristan chord (D F G♯ C) of T9S (the "inverse" of the preceding "T-chord" (G B D F) within the *same collection,* which signals the longer-range differentiation involved here). The phrase concludes with (B D♯ F♯ A), a (D♯ F♯ A C)-based T-chord found in T0S, but suggesting, by the associative (articulative) means discussed before, a "linkage" with T1S, in the (D♯ F♯ A C)-centered collection cycle. This inference of T1S would, of course, be more particularly entailed by the as-

sertion of constructs which appear *only between* T's; but this remark in itself sounds like talk about degree-of-assertion distinctions which are a rather rich source of compositional coherence, and hence would tend to increase one's bias in favor of a system in which such differentiations of degree were available.

As to the final phrase, note that both (E G♯ B D) and (F A C) occur in T6S—"balanced" by 6-relatedness with the T0S reference of (B D♯ F♯ A), the "shift" from (D F G♯ B) to (D♯ F♯ A C), and the "same-set" relation of the end-point of phrase 2 and the beginning-point of phrase 3.

But by the opening of the "principal section," the overall transpositional shift *is* entailed by the conjunction of (D F♯ A C) and (C E G), since the latter does not occur *within* any collection of the (T0-T3-T6-T9) cycle, and they *both* occur within only the (T1-T4-T7-T10) cycle, as constituents of T4S and T1S, respectively, and since this partitioning cycle is centered on just the (D♯ F♯ A C) construct on which we, for contextual reasons, have already decided to center this section, this seems an admirable point at which to leave the remainder of the task as an exercise for the reader.

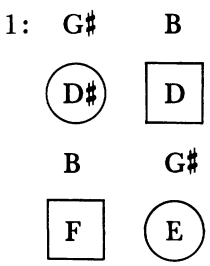
How about the body of the opera? Some indication of an answer to this question may be given by the following observations on the first few measures of the *Liebestod,* measured against the (0 3 6 9)-systematic metric, with particular reference to similarities observed to our previous observations regarding the Prelude.

First, a bit of derivational tune-detective analysis: we have already noticed the "diatonicization" of the "chromatic tetrachord" at the opening of the Prelude to Act I in the opening of Act III; and we have also noticed the *Grundgestalt* F-B spanning the entire third act. Here we may begin by noticing that the Prelude's upper-line *Grundgestalt* A♭-B may be described as characterizing the macrospan of the *Liebestod* (thus lying as a sub-span within the overall F-B span of the act as a whole).

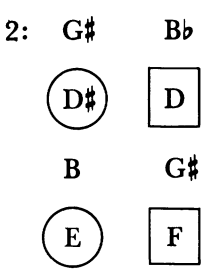
But the motivic-derivational chain leading from the wholly "chromatic" line that "fills in" the A♭-B span both locally and globally in the Act I Prelude to the "diatonic" lines in the later portions of the opera may be regarded as considerably less "general" or "casual" than such large-scale observations alone may suggest. Here is a possible associational path:

Start by imagining the following contrapuntal transformation:

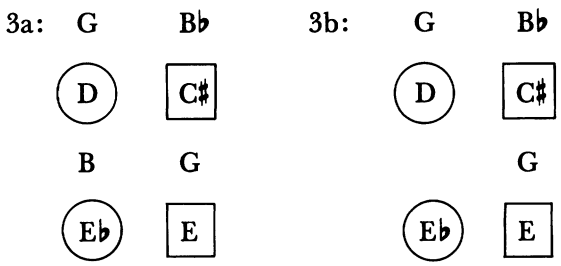
1) Consider the outer chords of mm. 2-3 as balanced by an interchange of displacements of reference (0 3 6 9) pitches in two registral voices—each displacing pitch being a member of a different one of the two other possible (0 3 6 9)'s. If the *displacing* pitches are represented as encircled, and the pitches they displace (call them *resolving*) are represented ensquared, each side of a diagram of the counterpoint will contain just one encircled and just one ensquared pitch:



2) Suppose the balanced succession unbalanced by placing *both* displacing pitches first, and both resolving pitches second, so that the balanced succession becomes a progression, from a displacement-bearing to a displacement-free chord; thus our diagram will contain two circles on the left-hand side and two squares on the right-hand side:



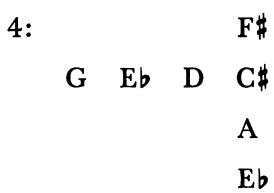
3) Now suppose the succession a) transposed on the model of the end of the Prelude to Act I; i. e., on to the (0 3 6 9) (C♯ E G B♭), or T11; and b) with the first chord altered to contain just a "verticalization" of the opening three-note figure, retaining both encircled notes, and projecting in particular the aspect of asserting one pitch from each possible (0 3 6 9):



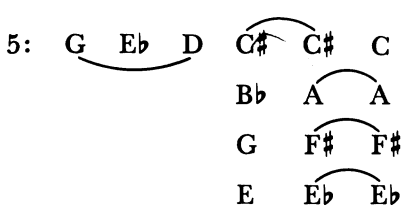
3b may now be read as a map of the two-chord counterpoint that opens Act II, as well as one which juxtaposes the opening three-note figure of the Sailor's Song at the beginning of Act I with the first orchestral chord of the act. And, transposed by seven semitones, the first chord of 3a may be heard, horizontalized, as the initiating four attacks of the bass tune beginning at m. 21 (regarding which see below):

F A B♭ D

4) Moreover, if we were to transpose the opening of the Act I Prelude on the model of the first chord of Act II, we would arrive at the following counterpoint:



5) If we *delay* the arrival on this first Tristan chord by first asserting the entire (0 3 6 9) chord of its "spoiler" note C♯, and then *extend* the counterpoint by "resolving" the spoiling C♯ to its (0 3 6 9)-completing reference pitch, the result would look as follows:



5 may also be read as a map of the first eight measures of Act II of *Tristan.*

Further, consider the opening "alto line" of the Prelude to Act I as a conjunction of two distinct "motivic segments," both phraseologically "isolated" as noted earlier; the first is the (A F E) (0 8 7) trichord that opens the Prelude and the Sailor's Song, and the second is the (F E E♭ D) "chromatic tetrachord."

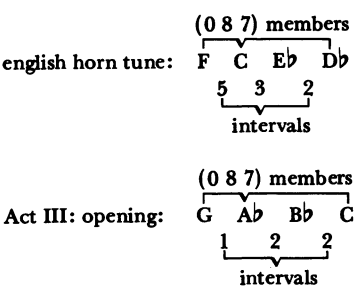
Now if we look again to the opening of the second act, the first continuous "theme" in the bass of the Act II Prelude (at m. 21) unfolds as follows:

F A B♭ D E♭ E G F

This may be "derived" from the opening of the Act I Prelude as, first, the "inversion" of the opening (A F E) into the two-pitch-class-preserving trichord (F A B♭), interlinked with a second "inversion" of (A F E), (B♭ D E♭), which, in continuing in exact complementation to the (A F E) line at the opening of Act I, through E and F (as B♭ D E♭ E (G) F)), reproduces the entire "chromatic tetrachord" at its original pitch-class level, but unfolded in retrograde (as the same tetrachord was unfolded in mm. 10-11 of the Act I Prelude). But the (F A B♭) inversion of the (A F E) trichord is also "filled in" in the passage by the "cambiata" G that intervenes between the E and the F of the "chromatic tetrachord." Thus is derived that "diatonic tetrachord" that we have already noticed in connection with the "upper line" at the beginning of Act III:[7a]

G A♭ B♭ C

[7a]The Act III english horn tune also begins with this tetrachord, 5-transposed, intervallically camouflaged, and retaining the (0 8 7) rhythm of the opening phrase of the Act:



which represents an exact *inverse* of the second-act (F G A B♭), and hence reproduces the motivic trichord in its original form as (0 8 7) (here (C A♭ G), *T3-related* to the opening (A F E)).

As to the Act II Prelude, the "continuation" of the bass tune on B♭ at m. 25 permutes the pitches of mm. 21-22, phraseologically "placing" the "diatonic tetrachord" where the "chromatic" one previously appeared, and thereby adjoins to that diatonic tetrachord the "linked"-7 C (as (F G A B♭ (C)), which becomes motivic in the third act as well, as:

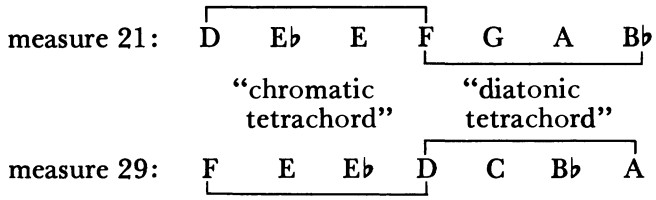
G A♭ B♭ C

(opening of Act III:)

(F)(G A♭ B♭ C)

which is still an exact inverse of the Act II cluster, but also preserves invariant the F-C extrema. The third version of the "bass tune" in Act II, at m. 27, interlocks the original "diatonic tetrachord" (F G A B♭), via the linked-7 C, to a new "chromatic" tetrachord (C C♯ D E♭), a conjunction which juxtaposes the (0 4 5)/(0 8 7) trichords (G E♭ D), (F C♯ C), and (F A B♭), the union of which is, in fact, the entire pitch-class content of the passage from m. 27.0 to m. 29.0. And the "soprano" countermelody at m. 29 begins with a descending line which unfolds, in presented "normal form," an exact inverse of the pitch-class contents of the m. 21 bass tune. This inverse preserves invariant the "chromatic tetrachord" (F E E♭ D), but adjoins it to a different "diatonic" one (D C B♭ A), whose earlier appearance in the passage at mm. 25-28 may thus be regarded as "linking" the mm. 21-22 pitch complex with its m. 29 inverse. Note, too, that the difference between the m. 21 bass tune's pitch-class content and that of the m. 29 "soprano tune" is just one element of each (G and C, respectively); the G "missing" in the m. 29 passage is immediately supplied in m. 30, and the motivic associations projected by the ensuing passage should be evident.

Here are the pitch-class contents of the m. 21 bass tune and the m. 29 soprano tune compared:



A final observation: the "repetition" of the "soprano" tune at mm. 33-38 is accompanied by a slowly unfolding bass line whose outline is (D Eb E F).

In the *Liebestod,* the explicit phraseological connection to the Act I Prelude of the successive rising T3's, both within and between phraseological articulations, continuing through an entire (0 3 6 9) span, is supported melodically by just the motivic connections we have noted. Thus the opening "*Liebestod* motto" (Eb Ab G) is an obvious permutation of the (A F E) trichord that opens Act I (transposed, of course). And comparing the referential pitch levels of the presentations of this trichord (and its inverses) at the beginning of the Act I Prelude, the beginning of Act III, and the beginning of the *Liebestod,* we may observe a (0 3 6) relation linking them:

Act I Prelude:	(A F E)	(T0S)
Act III Prelude:	(C Ab G)	(T3S)
Liebestod:	(Eb G Ab)	(T6I)

Note the preservation of Ab and G between the second and third trichords, which suggests a long-range relational analogy to the relation between the (F A Bb) and (Bb D Eb E F) of the Act II Prelude and the (A F E Eb D) of the Act I Prelude. And of course, the *Liebestod* itself carries out (and thereby presumably underlines) this long-range relation as, also, a short-range one in transferring (Eb Ab G) immediately onto (F# B Bb), which latter would "complete" an (0 3 6 9) cycle of trichord-transformation forms in our table, above. As a local relation, of course, the 3-transposition directly reflects the corresponding passage in the Act I Prelude.

But the continuation of the *Liebestod* line past the opening (Eb Ab G) establishes an even more "connective" association, as the (Eb Ab G) merges into an overall line that overlaps a "diatonic"

with a "chromatic" tetrachord. This overlap is arranged such that the "completion" of the chromatic tetrachord (A♭ G G♭ F) is "delayed" (as in m. 22 of Act II) by the intervention of the diatonic one (G♭ A♭ B♭ F), so that they both "complete" on the same attack, on F, which thus underlines the phraseological "break" following that point of convergence:

E♭	A♭	G					((0 4 5) trichord)
	A♭	G	G♭			F	(chromatic tetrachord)
			G♭	A♭	B♭	F	(diatonic tetrachord)

Also, the four attacks on the three pitches (E♭ A♭ G) perhaps suggest the "tetrachordal" framework as well (the F also completes a "diatonic tetrachord" with respect to that (E♭ A♭ G): (A♭ G F E♭), which is an inverse of (F G♭ A♭ B♭)). Note, too, the 3-related pitch classes (E♭, G♭) linking the two interlocked, inverse (0 8 7)/(0 4 5) trichords (*E♭* A♭ G) and (*G♭* B♭ F), a relation that is of course generative for the second-segment transposition of the whole tune "on" E♭ to a version on G♭.

But most interesting of all from the total-structural point of view is the fact that this conjunction of diatonic and chromatic tetrachords can be generated entirely (that is, the entire pitch-class content of mm. 1 and 2 of the *Liebestod*) as a conjunction of three ((0 4 5)/(0 8 7)) inverse pairs, with respect to three "0"s, namely, B♭, E♭, and A♭. This generation requires taking into account the F♭ that occurs two measures before the beginning of the *Liebestod* proper, but the (F♭ E♭ A♭) trichord is so explicitly unfolded in register that the *possibility* of its inclusion in the generative scheme seems more significant (that is, as an analytic *advantage*) than its *necessity* (as an analytic expedient).[8]

Thus the (B♭ D E♭) trichord, formed by the (E♭ D) bass succession, seems especially interesting as both the "longest-range" trichord of the passage (in terms of total time of unfolding), and the one most directly associated with the bass tune of the Act II Prelude. For it turns out that that bass tune, too, can be generated entirely as the intersection of three (0 4 5) trichords (without,

[8]That the (0 4 5) trichord has intrinsically special syntactic significance may be gleaned from the fact that it is the only non-symmetrical trichord (i. e., the only one containing three *distinct intervals*) each of whose members belongs to a *distinct* (0 3 6 9);

so just as *each* (0 3 6 9) is represented by a distinct *pitch-class* element, each *relation between pairs* of (0 3 6 9)'s is represented by a distinct *interval-class* element. Its special place in the (0 3 6 9)-systematic array may be discerned from the following filtration of some strands of the opening of the *Tristan* Prelude through the harmonic hexachords of T6S and T0S:

linear successions:

A - F - E - G♯ - [A]
D♯ - D
A♯ - B
m. 1 m. 2 m. 3

simultaneities:

[D♯ - D / B A♯]

[A - G♯ / F E]

m. 2 m. 3

harmonic hexachord, T6S:

E G♯ (B D) F A

harmonic hexachord, T0S:

A♯ D (F G♯) B D♯

(0 4 5)s:

{(A F E) / (E G♯ A)}

{(D♯ B A♯) / (A♯ D D♯)}

[The passage also embeds F A B♭ D, as:

A | A♯ D — T6S: (E G♯ (B D) F A
F | — T0S: B♭ D ((F G♯) B D♯)
m. 2 | m. 3

which may be taken as a connection with the "bass-line" tune at m. 21 of Act II. In an even more direct way, the embedding in the opening "upper line" of E G♯ A refers to the registral and intervallic position of the voice-part trichord in m. 1 of the *Liebestod*, where it is transposed so as to preserve one key pitch-class intersection:

E | G♯ A — Prelude
m. 1 | m. 2

| E♭ A♭ G | — *Liebestod*]
m. 1

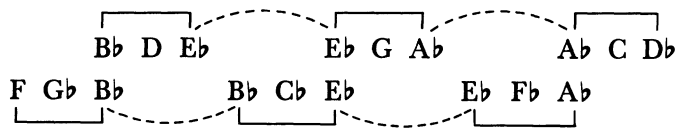
As noted, the eight pitch classes involved, which comprise the entire pitch-class content of the fragment, are completed within the whole fragment, within mm. 2-3, and by the two chords around the mid-point of mm. 2-3.

The special *Tristan*-systematic significance of dyads determining the interval 4 is discussed in note 6, above.

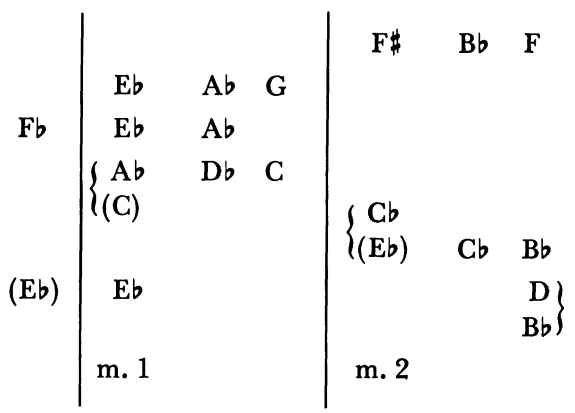
however, their (0 8 7) inverse counterparts), a condition which is representable as an interlocking (1+4) intervallic chain whose (0 4 5) members are T5-related, like those of the *Liebestod* passage:

Act II, mm. 21-22: E F A B♭ D E♭ G

And the three (0 4 5)/(0 8 7)) pairs of mm. 1-2 of the *Liebestod* (with the F♭ "upbeat") are representable as *two* similar chains, inversely related:[9]



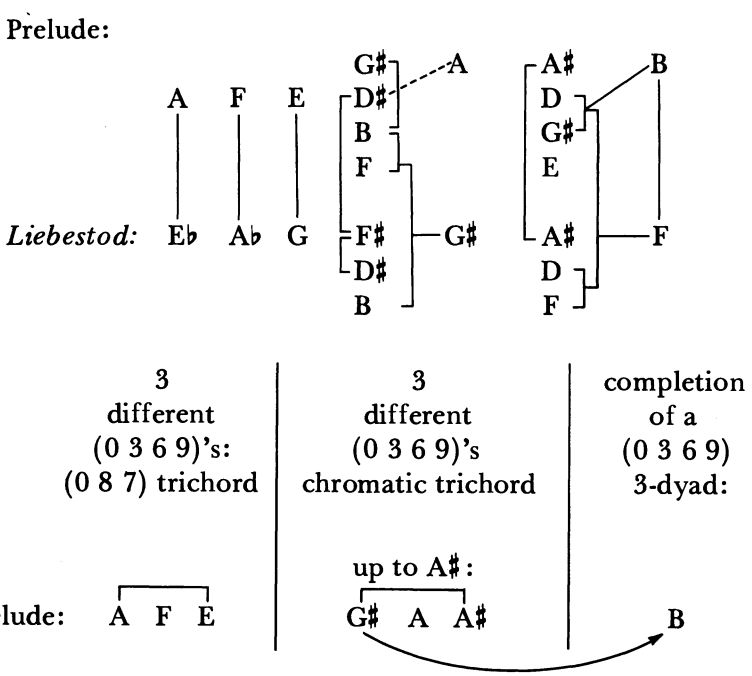
Here is a "rhythmic-registral" representation of the same passage:

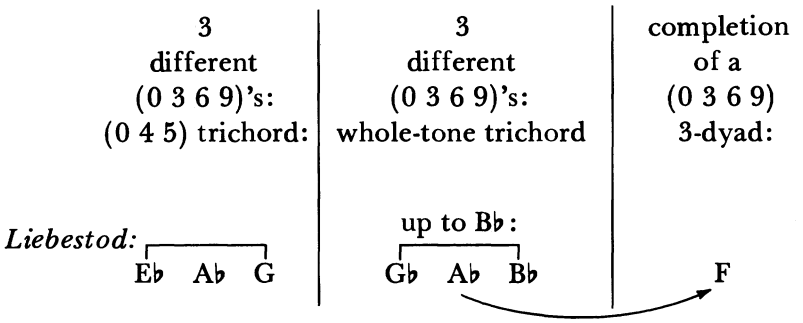


[9]A pair of interleaved, T5I-related (0 4 5/0 8 7) chains such as this one, extended to eleven entry positions, such that no pitch-class element appears in more than one entry position (and where 0-related pitch-class elements occurring in corresponding places on the two chains are considered to determine one entry position, so that (0,1,5) and (0,4,5) together determine just four entry positions, occupied by 0, 1, 4, and 5), is in fact the *maximal* (0 4 5/0 8 7) chain-pair in which such a uniqueness of entry-position/pitch-class element correlation is conserved: 1) any other interval of inversion between the chains produces a *shorter* possible non-duplicative chain-pair, and 2) the extension of the T5I-related pair by one more than eleven entry positions always results in a pitch-class duplication. In this light, the eleven-out-of-twelve pitch-class content of the first phrase of the *Liebestod* can be regarded as motivically "selective", insofar as it is distinguishable, as a motivated *choice*, from any set of, say, ten pitch-class elements, or from the set of all twelve.

(Note that to carry this scheme forward into mm. 3-4, the G of m. 1 (two measures before m. 3) must be invoked. But despite the exact parallelism of its "metric" position, two measures before its referent "downbeat," with the F♭ before mm. 1-2, and despite its equally parallel function as "leading" to G♭ with a direct registral succession (in mm. 1-2) as F♭ "leads" to E♭ in the preceding passage, this G is distinctly different in its relation within the passage from that of F♭, in a number of evident respects. But so are mm. 5-7 "different" from mm. 1-4 in the Act I Prelude, in particular because of the "common-tone" linkage of the first pitch of the second passage with the last pitch of the first passage, nearly as the two *Liebestod* passages differ.)

Through this loosely associative chain, then, we can connect the (0 3 6 9)-outlining openings of the Prelude and the *Liebestod.* But so far, it remains an open question whether the deployment of our (0 3 6 9)-systematic battery can materially deepen the structural integration of these associations. A first line of observation to this end might be a direct (0 3 6 9)-referential matchup of the openings of the Prelude and the *Liebestod;* for the sequence of (0 3 6 9) references is, to begin with, virtually parallel:





And the pattern of displacements is parallel, too, but in the significant sense that what we may hear as single pitch-class *leanings* within single chords in the Prelude may be matched with successive chord-*weightings* (and balances) in the *Liebestod:*

"T0" refers to the (0 3 6 9) (D F G♯ B),
in any permutation:

Prelude:	G♯	A	A♯	B
	D♯	D♯	D	D
	B	B	G♯	G♯
	F	F	E	E
	m. 2		m. 3	
leaning:	toward T1		toward T11	

Liebestod:	E♭	A♭	G	G	F♯	G♯	B♭	F
	C		D♭	C	B	B	B♭	
	A♭		B♭	B♭			F	
	E♭		E♭	E♭	E♭	E♭	D	
	m. 1				m. 2			
weighting:	T0		T1	T0 / T1	T0	T11	T11	

The leanings of successive T0-weighted chords in the Prelude first to T1 and then to T11 is "transformed" in the *Liebestod* into the successive weightings of the chords of two passages, first from T0 to T1 and then from T0 to T11, a parallelism preserved by the parallel 3-transpositions of the second articulated stretches of both Prelude and *Liebestod*. But whereas the two fragments of the Prelude complete a simple set of collection references, exhausting the going "tonic" cycle, those of the *Liebestod* are considerably more complex:[10]

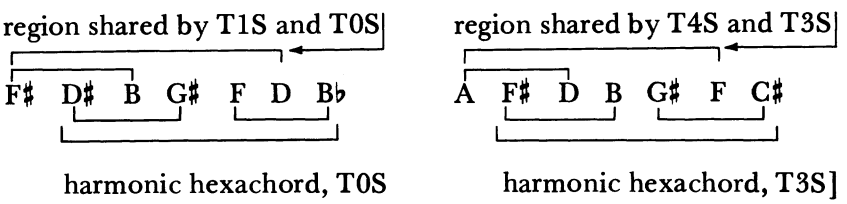
(names of collections *weighted* are unparenthesized:
names of collections *leaned* toward are parenthesized:)

E♭	G	G	F♯	G♯	B♭	F♯	A♯	A♯	A	B	C♯
C	D♭	C	B	B	B♭	D♯	E	D♯	D	D	C♯
A♭	B♭	B♭			F	B	C♯	C♯			G♯
E♭	E♭	E♭	E♭	E♭	D	F♯	F♯	F♯	F♯	F♯	F
T10S	(T4S)	T4S	T1S	(T1S)		T1S	(T7S)	T7S	T4S	(T4S)	
	T5S	T5S			(T11S)		T8S	T8S			(T2S)
(T9S)			(T0S)	T0S	T0S	(T0S)			(T3S)	T3S	T3S
m. 1			m. 2			m. 3			m. 4		

[The "stronger" modulatory weighting in the second sub-phrase of each phrase corresponds to the longer-range articulations they conclude: both T0S in m. 2 and T3S in m. 4 are expressed in three

[10]The (0 3 6 9) identification of the "centric" transposition cycle as (T1-T4-T7-T10) gives a special significance to the "$\frac{6}{4}$" representation of the initial triads of these "phrases," in that the (0 3 6 9) outlined at the lowest registral extreme is the "center" (D♯ F♯ A C), with the "spoiling" (A♭ B D F) always appearing "within" a "tonic" (0 3 6 9)-framing interval span, as the first A♭ of m. 1 appears registrally *between* E♭ and C. This intervallic disposition perhaps also clarifies the Tristan-chord-like status of the "triad," as half of an (0 3 6 9) with a 1-related "neighbor note" to a third (0 3 6 9) member. And taken as a crypto-Tristan chord, the (A♭ C E♭) triad of m. 1 is "completed" by the F♯ in m. 2, while another Tristan-chord is supplied by the association in m. 2 of the A♭ with the (B♭ D F) triad. Then, in m. 3, the (C♭ E♭ F♯) of m. 2 is associated with the A of m. 4, as the B is with (C♯ E♯ G♯). And the only *presented* Tristan chords in these four measures are associated with the "tonic" cycle (T1-T4-T7-T10).

progressively modulatory stages (on the model suggested on p. 211, above), progressing from two chords shared with the tonic-cycle collections (the first lying within the harmonic hexachord of the tonic-cycle collection, the second within that of the new collection) to a third chord, *not* shared by a tonic-cycle collection (which conjoins with the second chord to complete the entire harmonic hexachord of the new collection):



m. 2 m. 4

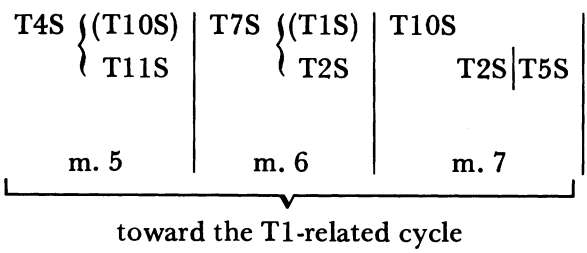
A clue to a less inscrutable collection-referential connection between the Prelude and the *Liebestod* may be available from our earlier construction of a parallelism of (0 3 6 9)-displacement rhythms by transferring from the relatively immediate *pitch-class-content* (0 3 6 9)-*leaning* shapes of the Prelude onto the syntactically deeper *set-referential* (0 3 6 9)-*weighting* shapes of the *Liebestod:* recall that we derived a pattern of (0 3 6 9) *completions* in each fragment of the Prelude by observing the pitch-class contents of each sub-fragment: each measure contained three (D F G♯ B) members, and two "displacing" non-(D F G♯ B) members, such that each whole *fragment* completed one whole (D F G♯ B) and one half each of the other two (0 3 6 9)'s. In the *Liebestod,* the weighting patterns transfer, onto *collection references* (rather than *pitch-class assertions*) *over two phrases* (rather than *within one fragment*), just this pattern of (0 3 6 9)-weightings: each phrase of the *Liebestod* contains chords weighted toward (or balanced with) *three* tonic-cycle collections (overlapping to complete a set of references to the entire tonic-cycle array), and chords weighted toward *two* non-tonic-cycle collections (such that *half* of each non-tonic-cycle array is referred to by weighting (or balancing) over that same two-phrase span).

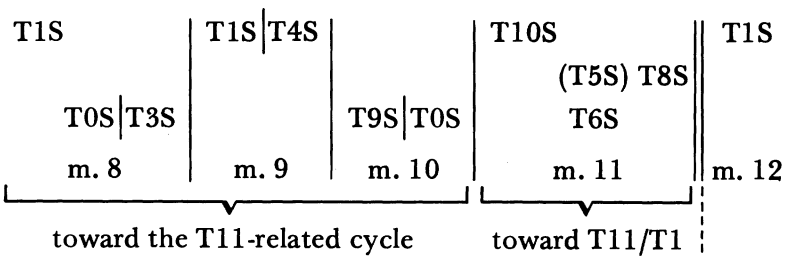
That the three-plus-two, within-a-measure, rhythm of the Prelude, where each "two" belongs to a single "displacing" (0 3 6 9), is altered in its transference onto the within-a-phrase scale in the *Liebestod,* where the displacement references are alternated, is a function of the multiple scaling of parallelisms—the *displacement* patterns are one-to-one, fragment to phrase, whereas the *weighting* patterns, two fragments to one phrase, are part of what gives the *Liebestod* its greater phraseological breadth, in correspondence with its deeper and more-levelled syntactical functionality and developmental complexity, as a rerealization of the Prelude.

The maneuver that crucially creates the room for this greater depth and breadth is the T3 collection-reference relation *internal* to each *Liebestod* phrase, which anticipates at short range the successive T3 transpositions of the whole phrases. (A new complexity here: in this respect the rhythm of the *Liebestod* is *contracted* relative to that created by the exclusively between-fragment T3 relation of the Prelude.) As a result, whereas the T6 collection-reference relation internal to each of the Prelude fragments creates a cycle which returns on itself after a span of just two successive 3-related transpositions, the cycle created by the internally contracted phrases of the *Liebestod* can spread out over four such transpositions before retrieving its beginning. This resource, directly exploited in the opening phrases of the *Liebestod,* is extended onto a still larger phraseological and temporal scale by the T3-related parallelism between m. 1 and m. 12, the beginning of a "second macrowave" in the *Liebestod;* in this sense mm. 1-11 have, relative to the passage beginning at m. 12, the relation of "first" to "second fragment". The development, after m. 4, of the T3 idea, may be charted in a way that seems interestingly suggestive of and for the phraseological cut of the passage:

> (The following chart may be read as displaying a series of six continuously unfolded phrase-segments, each initiated by a tonic-cycle (T1S-T4S-T7S-T10S) reference and displaced by references, over the first three measures (mm. 5-7), to collections from the T1-related cycle (T2S-T5S-T8S-T11S); over the next three measures (mm. 8-10), to collections from the T11-related cycle (T0S-T3S-T6S-T9S); and, in the last measure (m. 11),

before the new large-phrase beginning, to one collection from each non-tonic cycle; reading the upper line of the chart will reveal the tonic-cycle transposition pattern, first by T3, and then, in mm. 9-11, where the referential alternation is expanded into a 2-measure (rather than, as elsewhere, a 1-measure) rhythm, by T6; the T3 and T6 patterns of the tonic-cycle references are shadowed within each 3-measure group (and in their relation to the last one-measure group in m. 11) by the sequence of "displacing" collection-references, which may be read on the second and third lines of the chart.)





Should our persistent observer have endured thus far, he might be struck by the reflection that this entire network of rhythmic-motivic developments and associations is, for the very possibility of its existence as an experienceable musical phenomenon, wholly

consequential on the construction and invocation, in full hierarchical elaboration, of the (0 3 6 9)-cyclic reference-set array which we have been calling the *Tristan* system.

CONCLUDING REMARKS

The "systematic" status of the *Tristan* syntax proposed here can be likened to that of a *primary order-generated* system where the maximum determinacy is located in the order relations among internally ordered tetrachords. For the *content* of the referents remains unaltered from transformation to transformation (e. g., among *transpositions* in the *Tristan* system) of the collection; what is varied, and thus syntactically generative, is the "order" for (and within) each reference construct within the collection in each transformation. The determinateness of such an ordering, and hence the determinateness of its variability, depends on its generation of content-unique pitch sets as relations between reference constructs defined as order adjacent. Ordering, thus, is not necessarily interpreted in musical systems as "time order," as in the usual interpretations of the "classical" twelve-tone system. In fact, a single "chord" (in *Tristan*) represents a potential "ordering" partition of the pitch domain quite different in its signification from the polyphonic-triadic, register-independent, "voices" (and from the partial-content reference-set identifications), crucial to the tonal syntax. So that "serial" music, in presenting an ordered set, may *interpret* its orderings in terms of simultaneity, leaving *immediate succession* as an *articulative level* of structure. (This, essentially, is what seems to be involved in some recent self-declared "non-serial" music, such as Arthur Berger's "registrally determined" Six Piano Pieces.) Thus the usual notion of "serialism," even as sustained in sophisticated quarters, might yield to a more relativistic explication through the admission of possible ranges (i. e., variable domains) of interpretation of the "ordering" of the referential set (even, possibly, within a single piece). For in these terms, *Tristan* as we have described it is not only "twelve-tone" in a special sense but also "serial" in a special sense,[11] as radically precompositionally unique

[11] But the "special sense" is primarily that *Tristan stratifies* its serial-motivic surface relative to its ordered-collection references, and thus represents a more deeply and subtly layered—one might say more "advanced"—use of the "classical" twelve-tone system than almost anything that has appeared subsequently.

a work as any in the explicated literature. And its connection not only with the "motivically" expanded tonality of Mahler and early Schoenberg, and with the eventual "atrophy" of the tonal superstructure that produced purely "motivically" generated music, but with the Schoenberg twelve-tone system itself, seems in the light of our inquiry more than just a matter of "chromaticism," the "emancipation of the dissonance," or the deployment of non-traditional successions of triads.

4. EXAMPLE 2: WEBERN: OP. 5, NO. 4

Confirming evidence for the claims just advanced for *Tristan* is, it seems to me, available from this piece of Webern. That this is so I find particularly satisfying in the alternative that it may represent to the practice, in the analysis of twentieth-century music, of deriving bases of musical relatedness largely from textural-articulative characteristics, which seems to me unduly to minimize the structural range attributable to this literature. And if this early Webern piece is, as it seems to me, far more fundamentally *Tristan*-Wagnerian than anything I know in, say, Berg, where does that leave the facile dichotomies of "traditionalism" and "radicalism," or notions of "voluptuosity" and "asceticism," "sensuousness" and "austerity," as reflectors of musical distinctions of any considerable depth?

But there is what seems to me to be a rather worthier persuasive purpose in the presentation of the present example than the mere casting of aspersions, however diverting, on the manifestations of music-appreciative discourse. For considerable efforts have been invested by some of the most sophisticated contemporary music theorists to generate a "syntactical model" that would be adequate to account for, and to reify as a literature, the music commonly called "freely atonal," written mostly between 1910 and 1925 by the members of the "Viennese School," but possibly also including a considerable number of subsequently composed pieces (by, e. g., Sessions, Carter, etc.). The most considerable of these efforts is undoubtedly that of Allen Forte, whose most recent important article in this field, [15], attempts to deal with what I have called "motivic" complexes as syntactical sets by defining transformation relations among them not previously recognized in music-structural analysis. These transformations, so far, do not appear to

produce an extensive "structural-level" nest for the pieces involved, largely because they are conceived as relations among *successively presented sets,* rather than as ordered successions of transformations of a "background" referential set. Moreover, while the transformations appear to interrelate sets of various cardinalities, whatever their relative order positions within the presented succession (in which respect they are unique among music-analytic resources and perhaps most potentially fruitful), no "principal" cardinality appears to be inferrable as the source of "background" rhythmic, and, hence, total successional, structure in any given piece. But a number of kinds of relatedness among pitch complexes are displayed that involve novel and coherent extensions of the notions of transposition and complementation in terms of operations on the *interval* contents of sets. Such operations are Forte's principal means toward the construction of models for this group of compositions—the implementation of which is, presumably, what the realization of a "literature" consists of.

The only "analytic" example presented in Forte's article is Webern's Op. 5, No. 4. Some other remarks on the piece and on Forte's analysis, with suggested analytic revisions, appear in Howe [16]. The following is an attempt to account for all the pitch-set relations in the piece by means of a much simpler "syntactical model" than is proposed by either Forte or Howe. Its evident relation to the *Tristan* model, if taken as more than historically intriguing, is, nevertheless, not intended here to be taken as asserted evidence for the reification of still a different new "literature"-basket, but rather is intended to suggest the shared resistance to "literaturization" exhibited by the works of music composed during a particular compositional-developmental period. These works, I have already suggested, are perhaps mainly interrelatable by means of their "closeness" to the foundation-levels of musical structure at which, in contrast to "traditional" literatures, their significantly particularized "precomposition" begins, and by the relatively "shallow" level-succession from that point to the derivation of their actual articulative surfaces. Of course, "twelve-tone music" shares in this "contextuality" to a far greater degree than does "tonal music," in that pieces we associate in the twelve-tone literature we regard as proceeding from uniquely constructed reference sets (as compared with the invariance of the diatonic collection in tonal music), uniquely determined principal partitionings thereof (as dis-

tinct from the common triadicity of tonal music), and highly contextual interpretations of pitch-contrapuntal dimensions through variable correlations with temporal adjacency, registral adjacency, dynamics, timbre, and duration-contour (compared with the conjunction of those aspects with a basically registral counterpoint in tonal music).

The proposed model for the pitch structure of the Webern piece is based on a partitioning of the pitch domain by interlocking sets of equivalent dyads (of interval 7) that identify a twofold "exhaustion" of the "total chromatic." This 12 x 2 "norm" is possible since the identifying elements are members of "ordered couples," so that each pitch-class element is represented just twice, once in each "position" of the ordered couple (for (x,y), each pitch class represents just one value of x and one of y). The "partitioning cycle" may be represented as the following series of twelve 7-dyads in 1-transpositional sequence (a "circle of 1-related fifths").

(C = 0)
{(0 7) (1 8) (2 9) (3 10) (4 11) (5 0) (6 1) (7 2) (8 3) (9 4) (10 5) (11 6)}

(Compare these twelve "distinct dyads" to the twelve "distinct (0 3 6 9)'s" of the *Tristan* system.)

As in *Tristan,* the "harmonic" identities are derived as unambiguous representatives of "positions" on the transpositional chain with respect to a stipulated "midpoint": ((4 11) (5 0)); first, each parenthesis-enclosed dyad is content-unique, as is each consecutive-pitch-class trichord, each such tetrachord, each pentachord, and each hexachord. Dyads of adjacent members of disjunct enclosed dyads do, however, recur, e. g.:

(7 2) (8 3) (1 8) (2 9)

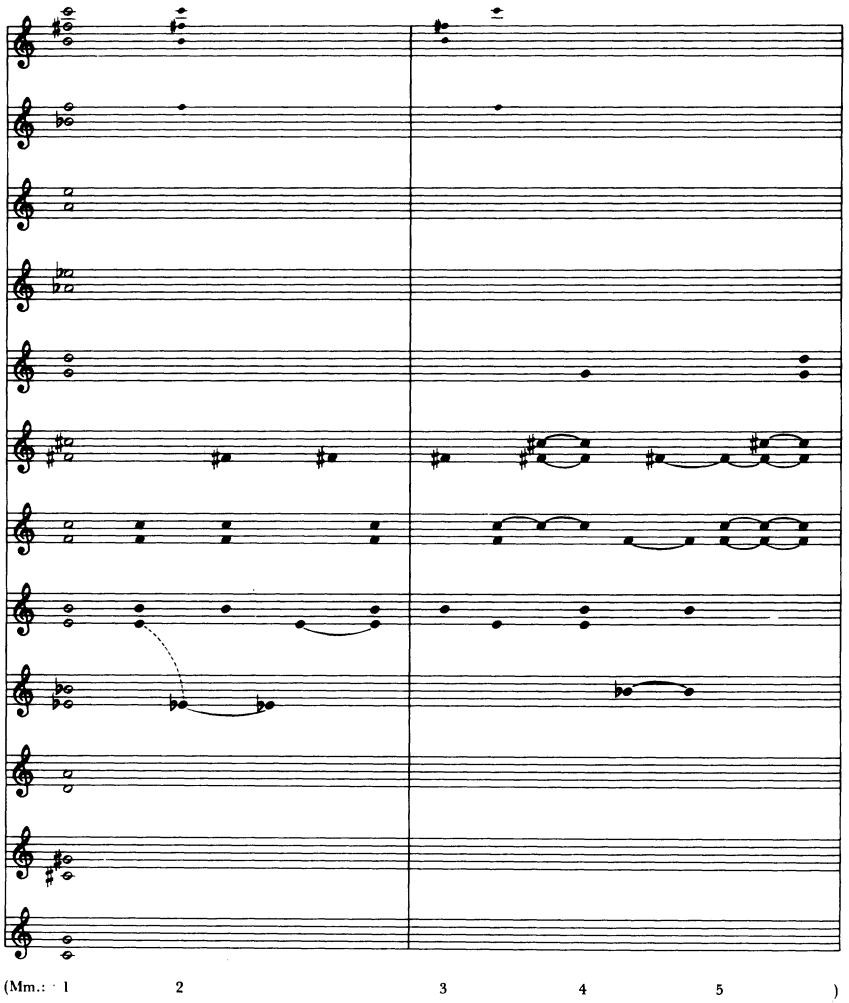
This recurrence is a principal associative factor in the harmonic articulation of the piece. Thus, there are two kinds of "degrees of similitude": partially shared pitch content with identical interval content, and partially shared interval and pitch content, both deter-

minable by reference to "position relations" on the "cyclic" chain; the first resulting from "whole dyad," and the second from "half-dyad" transposition, as:

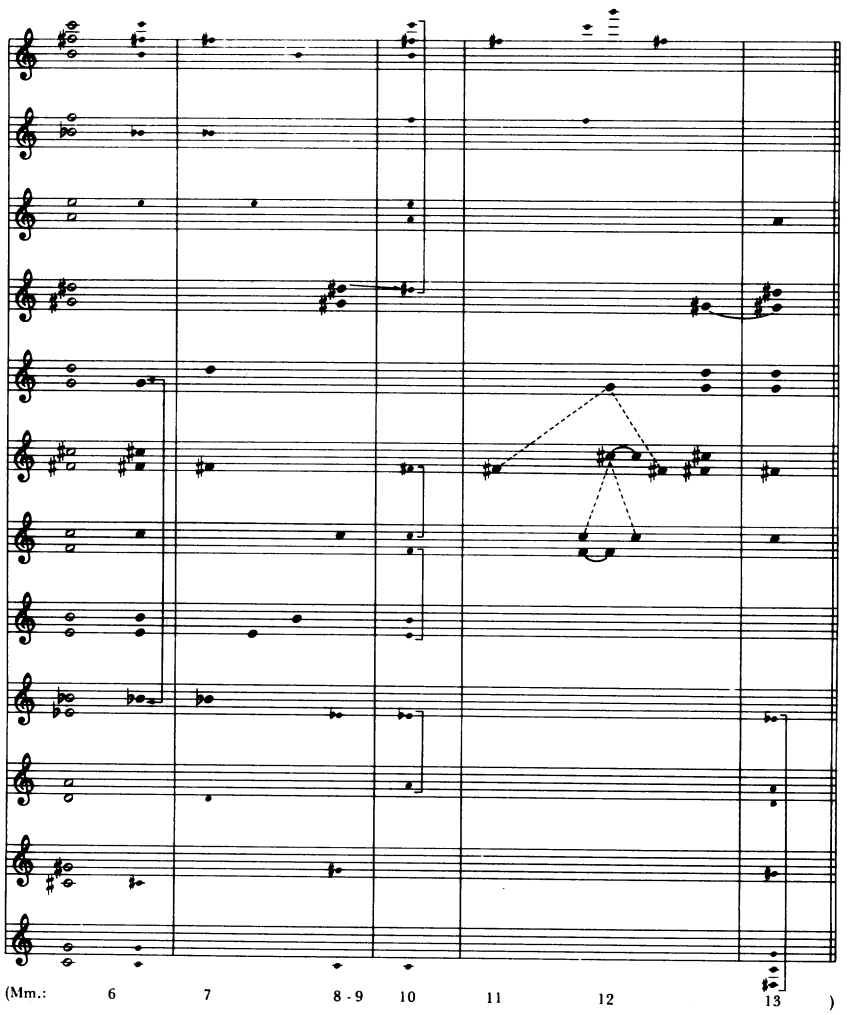
(violins)	m. 1:	4	11	5	0	
	m. 2:		11	5	0	6

The contents of the first of these ((4,11,5,0)) uniquely asserts a single two-dyad adjacency span in the given order-circle, while the content of the second ((11,5,0,6)) occurs *twice* in the order-circle, so that this second chord tends to *associate* the dyad area uniquely *fixed* by the first chord with the dyad area *halfway across* the circle. A complete pitch-modeling of the piece in terms of this syntactical reference appears as Ex. 11. Note particularly the "development" first in terms of "associated" areas (mostly by the (0 6) joint mentioned above), then at m. 6, in terms of "simultaneous distinct areas," and then the non-literal "recentering" at mm. 11-13. A particular measure of relatedness among simultaneous events is the symmetry of "interval distance along the pitch-partitioning chain"; note, especially, how the rhythmically stretched passage at mm. 7-9 asserts a correspondingly extended dyad-span, such that the "complementary" dyad-spans traced by the surrounding pitch successions are interlocked. Here connection with the results of the recent Schoenberg analyses in Lewin [26] and Lester [23] are interesting, particularly in suggesting that the identification of a functional "inversional balance" may not be limited to the level of actually presented registral dispositions.

In the light of this model, and its relation to the Forte "general-syntactical" one, the question is raised of the value of a "general-syntactical" model that produces explanations of greater complexity though not necessarily of greater depth than "individual-syntactical" models of some of its supposed applications. Is it worth it, for the sake of gathering some pieces into a "literature," to do so at the cost of such analytic-systematic complexity? And is it not consistent in any case with the "motivic" aspect of the music involved (symbolized in our model by the "close-to" relation of "background" ordering to presented "melodic" and "harmonic"



Ex. 11 (beginning)



Ex. 11 (concluded)

events) that individual cases *would* tend to reveal more, and more basic, non-correspondences with "other instances" than other "members" of other "literatures" exhibit toward one another; and hence, might not the effort to "syntacticalize" this group be likely to lead to a *net loss* in the coherence of *each member* individually? And would not that be a basic analytic disadvantage (see pp. 414ff. above)? These are the questions that seem to me to arise from the disparity between our model of Op. 5, No. 4 and Forte's. I do not presume them to have been answered, even implicitly, in the present essay, for our "mapping" of Op. 5, No. 4 does not yet constitute specification on the level of "analysis" that has been proposed; rather it is a set of measurements on the data of the piece which could presumably be organized into a particular musical structure that would be worth acknowledging as "that" of Op. 5, No. 4.

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