Differentiation of Concurrent Musical Strata

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Abstract

Music-theoretical research into textures featuring superimposition of independent layers of music suffers from considerable terminological fragmentation and imprecision, with notions such as "polytonality" remaining ill-defined and subject to semantic controversy. I first review existing research into the topic, highlighting these weaknesses. In order to address them, I then propose a differentiation model, an analytical tool that employs concise, precise and more up-to-date theoretical terminology to describe and quantify the way in which musical strata may be differentiated through divergences in construction. Finally, I apply the differentiation model to excerpts by Ireland, Britten and Vaughan Williams in order to demonstrate its relevance to music analysis. Ultimately, I argue that the differentiation model provides a more effective, consistent theoretical framework for analyzing layered musical construction.

Dans son état actuel, l'étude de textures musicales formées à partir d'éléments indépendants superposés fait défaut de par son manque de précision terminologique. La notion de polytonalité reste elle-même sans consensus définitif, faisant l'objet de nombreuses controverses. Abordant ce problème langagier, j'effectue d'abord un survol du travail théorique actuel afin d'en déceler ses faiblesses. Je propose ensuite un modèle de *différenciation de strates* qui décrit la manière dont plusieurs couches texturales indépendantes peuvent se distinguer structurellement l'une de l'autre. Ce modèle fait usage de langage concis, précis et mis à jour. Dans un dernier chapitre, afin d'avancer son utilité en tant qu'outil analytique, j'en démontre l'usage dans le contexte de passages d'Ireland, Britten et Vaughan Williams. Enfin, la notion de différenciation de strates offre un regard théorique sur la polytonalité et ses dérivés plus efficace et plus cohérent.

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I am also grateful for the support of my family and partner, which have been invaluable throughout.

Introduction

The term "polytonality" generally describes a situation in which multiple musical voices—often pitted against one another texturally by means of stratified orchestration and separation in register—each express a distinct pitch center and associated key; each of these keys coexists simultaneously with, yet independently from, the others. Despite this concept seeming rather straightforward, it continues to elude a systematic, satisfactory theoretical grounding. *Polytonalité*, a 2013 study by Philippe Malhaire, opens quite dramatically on the topic,:

> "Polytonalité… le mot fascine, effraie ou génère même parfois l'hostilité : dans tous les cas, cette forme d'écriture laisse rarement indifférent."
>
> "Polytonality… a word that fascinates, scares or at times even generates hostility: regardless, this type of writing rarely leaves one feeling indifferent."[1]

The concept of layered musical construction scares us perhaps less than the impassioned and at times confused semantic discourse it has generated, ranging the gamut from composers defining their own practice,[2] through debates about the legitimacy of superimposition of scales in Stravinsky[3] to dismissal of the notion of polytonality as a whole.[4] The issue at the centre of these debates has little to do with the legitimacy of superimposition as a compositional technique; rather, controversy arises from diverging views on its relevance to a theoretical discourse that seeks to unify all pitched components of a musical work under a singular analytic framework. Moreover, scholars entering the fray must contend with a bewildering array of *poly*-isms, most of them ill-defined terms open to conflicting interpretations. This situation illustrates the necessity of a new theoretical framework for discussing superimpositions of musical strata—a framework that employs more concise, consistently defined terminology and can separate theoretical claims from historical and stylistic connotations. This project represents an effort to set up such a framework,

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[1] Philippe Malhaire, *Polytonalité: Des Origines Au Début Du XXIe Siècle, Exégèse D'une Démarche Compositionnelle* (Paris: Harmattan, 2013), 13.

[2] Darius Milhaud, "Polytonalité et Atonalité," *La Revue Musicale* 4, no. 4 (1923): 29–44.

[3] Dmitri Tymoczko, "Stravinsky and the Octatonic: A Reconsideration," *Music Theory Spectrum* 24, no. 1 (Spring 2002): 68–102; Pieter C. Van Den Toorn, "Stravinsky and the Octatonic: The Sounds of Stravinsky," *Music Theory Spectrum* 24, no. 1 (Spring 2003): 167–85; Dmitri Tymoczko, "Octatonicism Reconsidered Again," *Music Theory Spectrum* 24, no. 1 (Spring 2003): 187–202.

[4] Milton Babbitt, "The String Quartets of Bartók," *The Musical Quarterly* 35, no. 3 (July 1949), 380.

building an analytical tool that discards existing terminological baggage and aims to provide better ways to quantify the differences in construction between independent musical layers.

In Chapter 1, I review existing research into layered musical construction, discussing each author's theoretical approach and the terminology they employ. I highlight not only terminological and methodological issues, but also examine the analytic motivations of the theorists that reject polytonality as a useful concept, arguing that their criticisms do not represent rejections of textures constructed through superimposition, but rather an opposition to the semantic implications of the term. I outline the objectives for a model of layered musical construction that resolves these issues.

In Chapter 2, I set out a theoretical model based on the notion of *differentiation*, representing quantifiable divergences in the construction of musical strata. Based on terminology coined by Leonard Meyer,[5] I categorize differentiation into two types: syntactic and statistical, providing a set of musical parameters for each. I then define a set of syntactic differentiating factors relating to pitch organization, providing examples and a detailed description of each. In an annex, I apply the differentiation model to the terminology encountered in Chapter 1.

In the concluding chapter, I use the differentiation model as an analytic tool. I provide an overview of excerpts by John Ireland, Benjamin Britten and Vaughan Williams, demonstrating the use of the terminology introduced in Chapter 2 and providing a jumping-off point for future analytic work on interactions between stratification of a passage's texture and its formal structure. Ultimately, I argue the necessity of replacing existing terminology for more satisfying future theorizing of strongly stratified textures.

[5] Leonard B. Meyer, "A Universe of Universals," *The Journal of Musicology* 16, no. 1 (Winter 1998): 3–25.

Chapter 1 : Reviewing prior theorizing of layered musical construction

Prior to modelling how the parts of a musical texture may set themselves off from each other, in this chapter, I provide a broad overview of the most significant writings on the topic. I first review Francophone musicological work on polytonality. Following this, I provide an overview of rejection of polytonality in Anglophone music theory, which has most prominently figured in analyses of the works of Igor Stravinsky. Finally, I delve into more recent theorizing that breaks away from the term "polytonality," adopting a more flexible and broader view of how musical layers may gain independence from one another. Throughout, I highlight the theoretical issues that the differentiation model will address in chapter 2.

Polytonality in the Francophone sphere

Music-theoretical research into polytonality begins with the 1923 article "Polytonalité et Atonalité," by French composer Darius Milhaud (1892-1974). [6] Though François de Médicis, in a historical survey, identifies use of the term "polytonality" in critical opinions published during the 1910s,[7] Milhaud's publication represents the first significant *theoretical* investigation into the subject. His conception of polytonality (formed through personal compositional experience) involves the superimposition of lines each featuring a diatonic, triadic construction. In this conception, chromaticism appears very infrequently, with each line expressing a key centre quite unambiguously. As a first attempt to theorize these superimpositions, Milhaud provides a straightforward inventory: there effectively exist eleven possible combinations of two triadic roots, four associated pairings of major/minor qualities, and six possible "inversions" of the resulting

[6] Darius Milhaud, "Polytonalité et Atonalité," *La Revue Musicale* 4, no. 4 (1923): 29–44. Further citations will refer to the following reprint of this article: Darius Milhaud, "Polytonalité et Atonalité," in *Notes sur la Musique: Essais et Chroniques*, ed. Jeremy Drake (Paris, Flammarion: 1982), 173-88.

[7] Francois de Medicis, "Darius Milhaud and the Debate on Polytonality in the French Press of the 1920s," *Music and Letters* 86, no. 4 (November 2005): 573–91. De Médicis goes over a large number of historical sources, focusing primarily on their aesthetic and political implications. While the early debates on polytonality prove to be of considerable historical interest, I retain only the writings of Milhaud and Koechlin here. They prove to be the two main sources of significant early theorizing (as opposed to aesthetic discussion and criticism) and the most relevant to constructing the model of chapter 2.

collection. The associated charts from the article are reproduced in Figure 1.1.[8] Much of the remainder of the article consists of identifying and describing polytonal passages in the composer's own works and in works of his contemporaries (with an attempt at identifying historical precedent along the way[9]). Though this descriptive works appears quite straightforward, one example would become a bearer of controversy: that of the *Petroushka* chord, which, as shall be discussed further below, has been subject to multiple conflicting harmonic interpretations. For Milhaud, however, the chord straightforwardly represents a bitonal combination of type VI, as illustrated in Figure 1.2.[10]

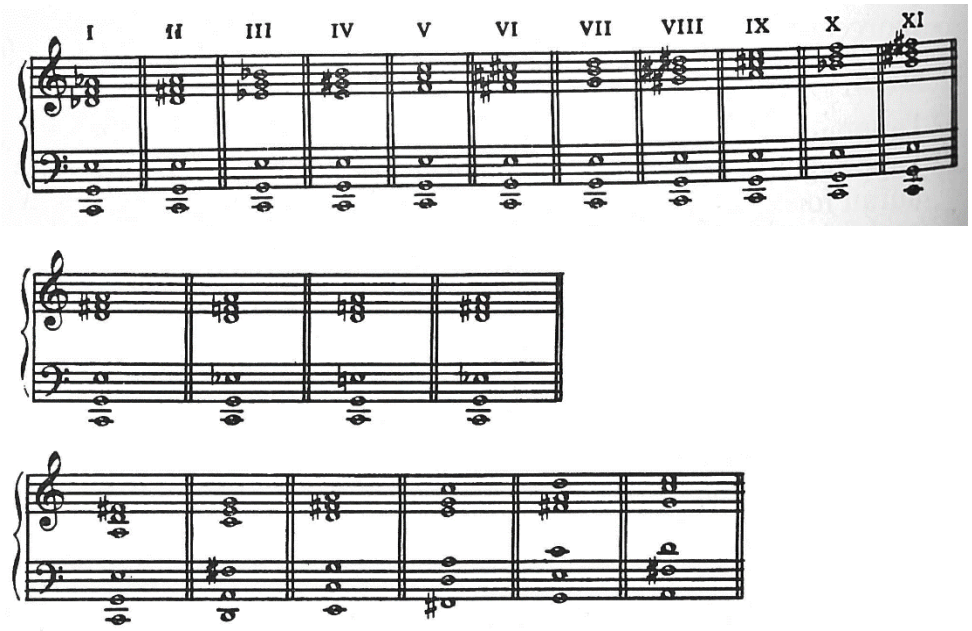

Figure 1.1: *Milhaud's charts of triadic combinations. First, all eleven combinations of triadic roots; second, four combinations of major and minor chord qualities; third, six possible inversions of such a combination. Reproduced from Flammarion under fair use.*

[8] See Milhaud, "Polytonalité et Atonalité," 176-82. Figure 1.1 reproduces the charts on 176-77. Milhaud further extends the taxonomical approach to combinations of three triadic roots, producing fifty-five of these, eight combinations of qualities and nine inversions.

[9] See the Bach canon discussed in "Polytonalité et Atonalité," 174-75, which Milhaud argues represents an early version of polytonal thinking. A potential counterargument to Milhaud's claim that the A-F combination in measure 9 represents a harmonic "mistake," belying the work's polytonal nature: Fuxian counterpoint specifically permits sixths as a valid consonance, regardless of the chords that could be produced by the addition of a third voice. The A-F sixth could potentially be considered as betraying purely contrapuntal, linear thinking rather than polytonal thinking. However, attributing the difficulty of interpreting this A-F sixth harmonically to the conceptual independence of each voice suits Milhaud's aesthetic argument of polytonality as a logical outgrowth of traditional practice: "From the moment where canons at intervals other than the octave were permitted, the notion of polytonality was laid out." "Le jour où les canons autres qu'à l'octave furent admis, le principe de la polytonalité était posé." Milhaud, "Polyonalité et Atonalité," 174.

[10] Figure 1.2 reflects Milhaud's discussion in "Polytonalité et Atonalité," 177.

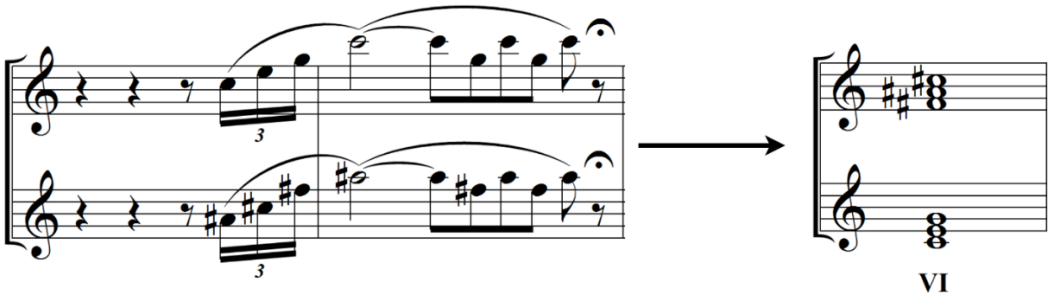

Figure 1.2: *Presentation of the Petroushka chord in the clarinets at rehearsal 61 (second tableau) of Petroushka (1911); Milhaud interprets this chord as a Type VI triadic superimposition.*

"Polytonalité et Atonalité" foreshadows the terminological complexities that come to characterize future research. Milhaud effectively distinguishes between two types of polytonality: the contrapuntal ("*contrapuntique*") and harmonic ("*harmonique*"). These terms refer to textural function, with the latter indicating that the superimposed layers are conceived as melodic (generally monophonic) lines, and the former indicating that one or more of the superimposed layers is constructed chordally.[11] Though useful for describing stylistic characteristics of the musical surface, this conceptual division already muddles the meaning of the term "polytonality": it enlarges its scope to include not only pitch syntax, but textural configuration as well. Milhaud's polytonality then effectively binds syntax and style together into one complete compositional package; unfortunately, as he himself implies ("So many composers, as many different polytonalities"[12]), this style-dependent conception precludes a basic, universal definition of polytonality. The definition in fact seems to change with each composition approached by the analyst; in later research, this ends up translating to a lack of terminological consensus.

The writings of French theorist and composer Charles Koechlin (1867-1950) form a second source of theoretical interest; particularly the 1926 subsection of the *Théorie de L'Harmonie* dealing with polytonality[13] and the analogous 1931 subsection of "Évolution de L'Harmonie," a contribution to the Encyclopedia of the Paris Conservatory.[14,15] Koechlin largely adopts Milhaud's descriptive

[11] *Ibid*., 183-184.
[12] "Autant de compositeurs, autant de polytonalités différentes." *Ibid*., 184.
[13] Charles Koechlin, "Évolution de L'Harmonie. Bitonalité, Polytonalité, Atonalité," in *Théorie de L'Harmonie*, vol. 2/3. (Paris: Max Eschig, 1926), 250–66.
[14] Charles Koechlin, "Évolution de l'Harmonie. Période Contemporaine. Polytonalité - Atonalité," *Encyclopédie de La Musique et Dictionnaire Du Conservatoire* (Paris: Delagrave, 1931).
[15] Both of these publications share a considerable amount of content, being near-identical in conception. However, the Théorie excerpt contains more "hard" theoretical detail, while the Encyclopédie excerpt focuses more on the affect generated by various polytonal combinations.

approach, identifying various deployments of polytonal material in contemporary compositions and upholding the division between contrapuntal and harmonic brands of polytonality; however, he hypothesizes historical precedents of polytonal thinking in much greater detail, and delves more deeply into the affective and aesthetic ramifications of polytonality. Of note is Koechlin's discussion of the sounding result of polytonal combinations. In the *Théorie,* he notes that the registral disposition of triadic combinations affects the perception and most plausible analysis of the sounding result in quite striking ways; with possible interpretations ranging from unichordal (as a $9^{th,}$ 11^{th}, or 13^{th} chord), to polychordal (as the superimposition of multiple triads) to atonal (with the triadic components being completely lost in the texture).[16] In chapter 2, I discuss this phenomenon further, in connection with the notion of intensity of stratification.

Turning to more recent research, the past decade or so has seen a revival of interest in the phenomenon of layered musical construction on the part of scholars in the French-speaking world. The 2005 French publication *Polytonalité/Polymodalité: histoire et actualité* collects a number of essays on the topic, generally focused on the music of a specific composer.[17] The repertoire dealt with proves quite diverse, ranging from excerpts by Richard Strauss and Paul Hindemith[18] to works of Olivier Messaien.[19] The term "polytonality" here appears imprecisely-defined—a consequence of the wide variety of composers studied, as well as of a lack of terminological consensus among the authors published in the collection. Consider Figure 1.3, a passage from Hindemith's second String Quartet, op. 10 (1918); Otto describes it as an early experiment in polytonality, representing "the technique of superimposing musical elements taken from different tonalities."[20] Otto argues that, in m. 63, while the viola line outlines a diminished seventh chord built on C, the remainder of the ensemble outlines a diminished seventh on built on F—thereby occupying a distinct tonal space, as illustrated in Figure 1.4. This analysis appears rather careless: while the viola's onbeat attacks do effectively outline a C diminished seventh chord, the second sixteenth notes of every beat nevertheless represent tones of the F diminished seventh expressed in the rest of the quartet.

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[16] Koechlin, *Théorie de L'Harmonie*, 256-257, 263-265.

[17] Michel Fischer and Danièle Pistone, eds., *Polytonalité/Polymodalité : Histoire et Actualité*, Conférences et Séminaires 21 (Paris: Université Paris-Sorbonne, Observatoire Musical Français, 2005).

[18] Patrick Otto, "La Polytonalité dans les Œuvres de Richard Strauss et Paul Hindemith," in *Polytonalité/Polymodalité*, 73-88.

[19] Michel Fischer, "Olivier Messiaen. Une Intellection Modale et Polymodale exposée au Défi de la Couleur," in *Polytonalité/Polymodalité*, 201-232.

[20] Otto, "La Polytonalité dans les Œuvres de Richard Strauss et Paul Hindemith," 78: "la technique de superposition d'éléments musicaux de tonalités différentes." Figure 1.3 reflects the discussion in 78-79.

Furthermore, the surrounding measures remain in a firmly diatonic, harmonically unified context. A more straightforward interpretation of this passage groups all instruments together, expressing four consecutive minor triads each a minor third apart (see Figure 1.5). In this interpretation, the roots of each triad form a diminished seventh chord, with the viola being the instrument in charge of each triad's fifth; while its pitches are not part of the harmony governing the sequence of roots, it remains harmonically unified with the rest of the ensemble. If the impression of a distinct tonal space can then be said to present itself in the viola at all, it emerges only very weakly. If we do not wish to discard his analysis entirely, then, Otto's conception of polytonality can be said to encompass even subtle distinctions between the chord tones taken up by different musical lines.

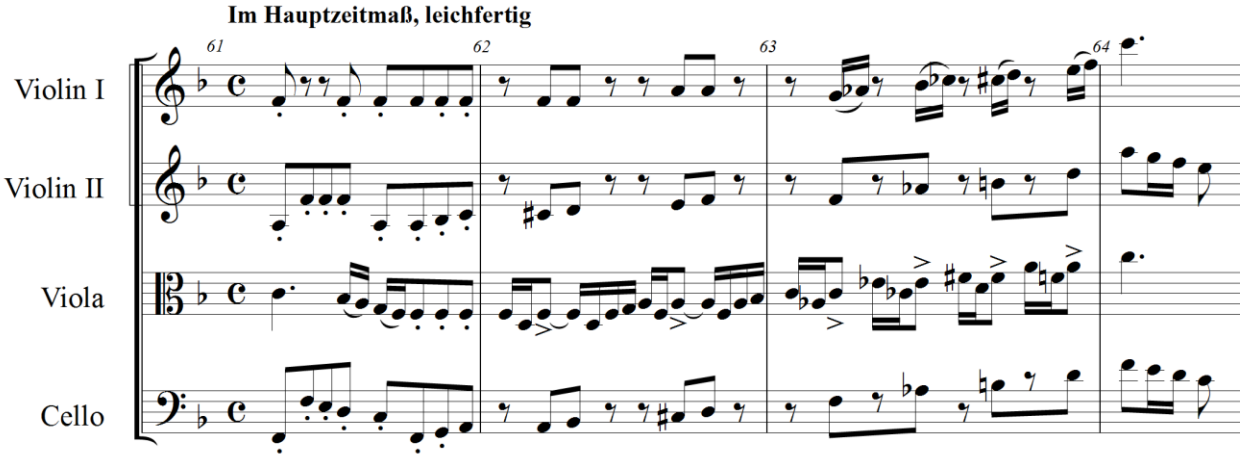

Figure 1.3: *Paul Hindemith, String Quartet op. 10 (1918), mm. 61-64. Excerpt included under fair use.*

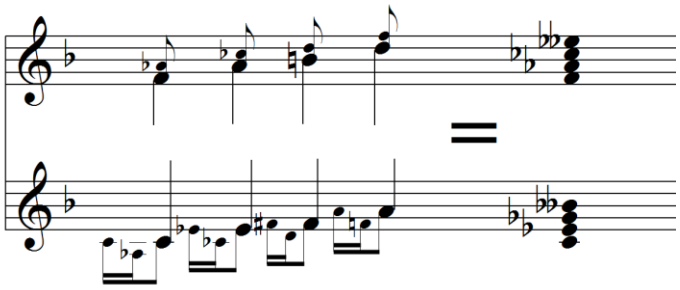

Figure 1.4: *Otto's interpretation of m. 63. The ensemble (top staff) expresses an F diminished seventh chord, while the viola (bottom staff) expresses a C diminished seventh chord.*

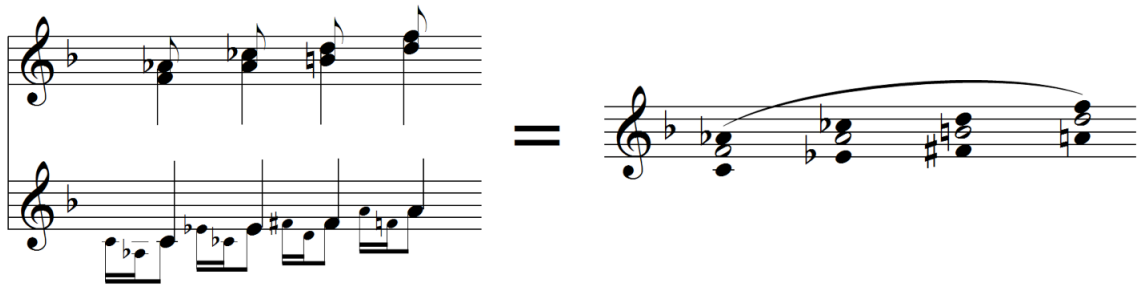

Figure 1.5: *A more straightforward interpretation of m. 63. The ensemble plays the root and third of successive minor triads, while the viola supplies the fifth. The triad roots combine to form a diminished harmony on F.*

This quite loose conception clashes with the more restricted interpretation advanced by François de Médicis, whose contribution focuses on Milhaud's works and the deployment of polytonality therein.[21] De Médicis adopts the composer's own notion of polytonality:

> "Pour Milhaud, la polytonalité semble désigner d'abord la combinaison de matériaux diatoniques (accords et mélodies) suggérant différentes tonalités. Il définit deux types de polytonalités : la *polytonalité harmonique* lorsqu'on combine des accords classés, et la *polytonalité contrapuntique* lorsqu'on superpose des lignes mélodiques diatoniques. Chaque strate diatonique suggère de façon plus ou moins claire une tonique (ou plusieurs si elles modulent)."

> "For Milhaud, polytonality seems to refer to primarily the combination of diatonic materials (chords and melodies) that suggest different tonalities. He defines two types of polytonality: *harmonic polytonality*, referring to combinations of traditionally-identifiable chords, and *contrapuntal polytonality*, referring to combinations of diatonic melodic lines. Each diatonic stratum suggests a tonic more or less clearly (or tonics, if the strata modulate)."[22]

From the outset, this definition precludes the faint divergences of Otto's example. In fact, in Figure 1.3, the viola line is neither accountable to any major or minor scale, nor centred on a salient referential pitch—both strikes against the de Médicis' definition, which implies close adherence to the diatonic collection and expression of an analytically-identifiable tonic. Many of Milhaud's works—particularly the *Saudades do Brasil*, op. 67 (1920)—adhere to these criteria and express their internal layering much more strongly. The opening of *Botofago* (Figure 1.6), with its jarring superimposition of F minor and F-sharp minor, illustrates. For de Médicis, then, diatonicism and clear expression of centricity are essential markers of polytonality, which can be observed in a quite limited set of musical contexts.

[21] François de Médicis, "La polytonalité selon Darius Milhaud: 'Plus Subtile dans la Douceur, Plus Violente dans la Force…'" in *Polytonalité/Polymodalité*, 91-116.
[22] *Ibid.*, 92.

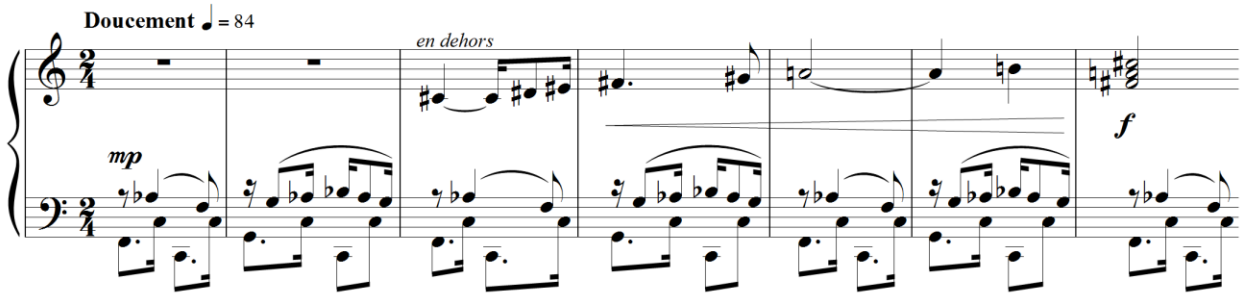

Figure 1.6: *Opening of "Botofago" from Milhaud's Saudades do Brasil, op. 67 (1920). The right hand is set in F-sharp minor, while the accompanimental patter in the left is set in F minor. Excerpt included under fair use.*

De Médicis, as does Koechlin, acknowledges that certain combinations of keys, though clearly distinct and of course polytonal on paper, produce textures that can be heard in ambiguous ways.[23] Such is the case in the opening of *Corvocado* from the *Saudades*, for which he provides two contrasting analyses: one solely in G major, and one treating the left hand in G major and the right hand in D major. Fig 1.7 illustrates both analyses.[24] In response to these ambiguities, de Médicis distinguishes between polytonality "in the broad sense" and polytonality "in the strict sense," with the former term denoting situations where distinct referential pitches emerge weakly or ambiguously, and the latter denoting situations where distinct referential pitches assert themselves quite strongly upon hearing.[25] While the distinction between two "senses" of polytonality proves useful for identifying the level of analytical ambiguity in a given passage, it contributes to an increasingly saturated repertoire of terms. Accumulating even more terminology, de Médicis (insisting on adhering closely to Milhaud's original language) maintains the distinction between harmonic/contrapuntal (*i.e,* chordally or melodically expressed) polytonality, often using the term "polyharmony" to refer to the latter. He also cites "bitonality," "polychord," as additional terms used in the literature, while deciding to collapse "polymodality" into his definition of polytonality.[26] These procedures exemplify the two main problems of current research. In the first case, an increasingly large and unwieldy set of terms exists to denote different types of musical

[23] Ambiguity in situations where the tonal distance between layers seems insufficient to create an impression of total independence will be discussed further in chapter 2, in the section on intensity of differentiation. The larger conflict between analyses that seek unification of the totality of the musical texture and those that more readily accept internal divisions of the texture is discussed further below.

[24] Figure 1.7 is adapted from de Médicis, "La Polytonalité selon Darius Milhaud," 108.

[25] Polytonalité au sens large and Polytonalité au sens strict, respectively. See de Médicis, "La Polytonalité selon Darius Milhaud," 95-96.

[26] *Ibid*., 96. De Médicis, in including modal language under the umbrella of polytonality, hints at the larger notion of superimposing multiple referential pitch classes, or centricities, irrespective of the manner in which they are expressed. This notion will prove quite useful for establishing categories of differentiation in Chapter 2.

textures constructed in independent layers, each referring to some diverging characteristic (key, scale, mode…) or to the way in which the total texture is configured (chordal, polyphonic…). Second, the terms themselves are ceaselessly re-defined by theorists, in stricter or more permissive ways depending on the type of music studied.

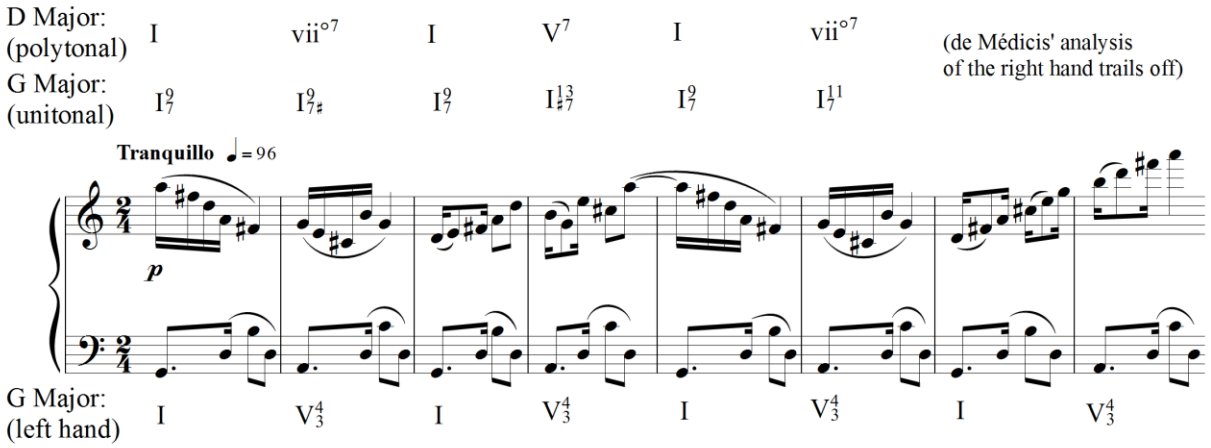

Figure 1.7: *Opening of "Corvocado" from Milhaud's Saudades do Brasil, op. 67 (1920). De Médicis illustrates analytical ambiguities (polytonality in the broad sense) by providing both a unitonal and polytonal analysis of the right hand, set against a G major pattern in the left. Reproduced with permission from OMF.*

A later collection from 2011, *Polytonalités*,[27] expands the theoretical horizons of polytonal research, featuring a broader repertoire (works by Franz Liszt[28] and John Williams[29] are studied) and includes more advanced theorizing.[30] Scholars show a greater awareness of the imprecision and vagueness of the term "polytonality" in this publication; Philippe Malhaire, in an essay on the origins and definition of polytonality, outlines the issue:

> "En réalité, le musicologue est confronté à un problème terminologique de taille car un même terme recouvre des réalités fort différentes selon les musiciens, ce qui a donné naissance à de nombreuses polémiques, certains auteurs allant jusqu'à nier la démarche et le sentiment polytonal[…] Au sens strict, on serait tenter [sic] de penser qu'il s'agit de l'alliage des concepts 'poly' et 'tonalités,' impliquant donc la superposition de lignes tonales différentes, chacune

[27] Philippe Malhaire, ed., *Polytonalités* (Paris: Harmattan, 2011).

[28] Grégoire Caux, "Le Procédé de Stratification et de Verticalisation chez le Dernier Liszt : Quelques Pistes de Réflexion," in *Polytonalités*, 81-100.

[29] Jérôme Rossi, "Les Harmonies Polytonales dans la Musique de Films de John Williams : Étude des Ressources Expressives de la Polytonalité," in *Polytonalités*, 179-200.

[30] See particularly Franck Jedrzejewksy, "Combinaisons Polytonales, Pertonales et Métatonales," in *Polytonalités*, 39-56. Jedrzejewski classifies combinations of two major or minor triads according to their resulting spectrum, using as criteria the similarity of potential virtual fundamentals to the constituent triads. The following essay consists of a sampling of North American literature dealing with polytonality, focused on a handful of analyses that employ the language of pitch class set theory. See Marc Rigaudière, "L'un et le Multiple: La Polytonalité dans la Théorie Musicale Nord-Américaine," in *Polytonalités*, 57-78. I discuss some of the literature reviewed therein in greater detail below.

> évoluant toutefois en respectant les règles fondamentales admises de l'écriture dite 'tonale.' Or, les seules pièces répondant strictement à cette conception sont les *Saudades do Brasil* (1920) de Darius Milhaud[…] Il en va tout autrement pour l'écrasante majorité du répertoire, le mot 'polytonalité' devant être alors envisagé selon une perspective plus globale."

> "In reality, musicologists are confronted with a significant terminological problem since this one term denotes vastly different situations according to different musicians, which has given rise to a number of polemics, with certain authors going so far as to deny the process and effect of polytonality[…] In a strict sense, we might think that it involves the joining of the concepts 'poly' and 'tonalities,' thus implying the superimposition of different tonal lines, each nevertheless respecting the fundamental rules of writing designated 'tonal'. However, the only pieces that tightly correspond to this conception are the *Saudades do Brasil* (1920) of Darius Milhaud[…] The case is much different for the overwhelming majority of the repertoire, the word 'polytonality' then requiring a more global perspective."[31]

Malhaire goes on to suggest the term "polypolarity" to designate the "global perspective" required by most repertoire, adding a new term to an already crowded ecosystem.[32]

The previously-mentioned study from the collection by Grégoire Caux, dealing with the late works of Liszt, bears mention here for discussing the broad notion of layered musical construction without reference to polytonality. Caux considers that, though Liszt's output is generally unitonal, his late works feature a number of instances where parts of the total musical texture establish greater independence than is usually expected. This "principle of dissociation of sounding strata"[33] operates through superimposition of chords and chromatic lines all attributable to one key, or combination of lines that each display a degree of tonal ambiguity. Figure 1.8 illustrates Caux's analysis of the final bars of *Trübe Wolken* (1881), where three tonally-ambiguous chromatic strata can be identified: the bass voice, leading to A, the augmented triad on E-flat occupying the middle register, and the upper line leading from E-flat to G.[34] While no tonalities are definitively implied, it remains possible to segment the texture into independently-operating layers, each governed by their own melodic process.

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[31] Philippe Malhaire, "Redéfinir la Polytonalité," in *Polytonalités*,14-15. Of particular note here is that Malhaire implicitly criticizes a strict, literal interpretation of the term "polytonality." This same literal interpretation has been, however, relied upon by North American theorists rejecting the notion on the basis of semantic incoherence, as discussed further below.

[32] *Ibid*., 15.

[33] "Principe dissociatif des strates sonores" : Caux, "Le Procédé de Stratification," 81.

[34] Figure 1.8 reflects the discussion in Caux, "Le Procédé de Stratification," 88-89.

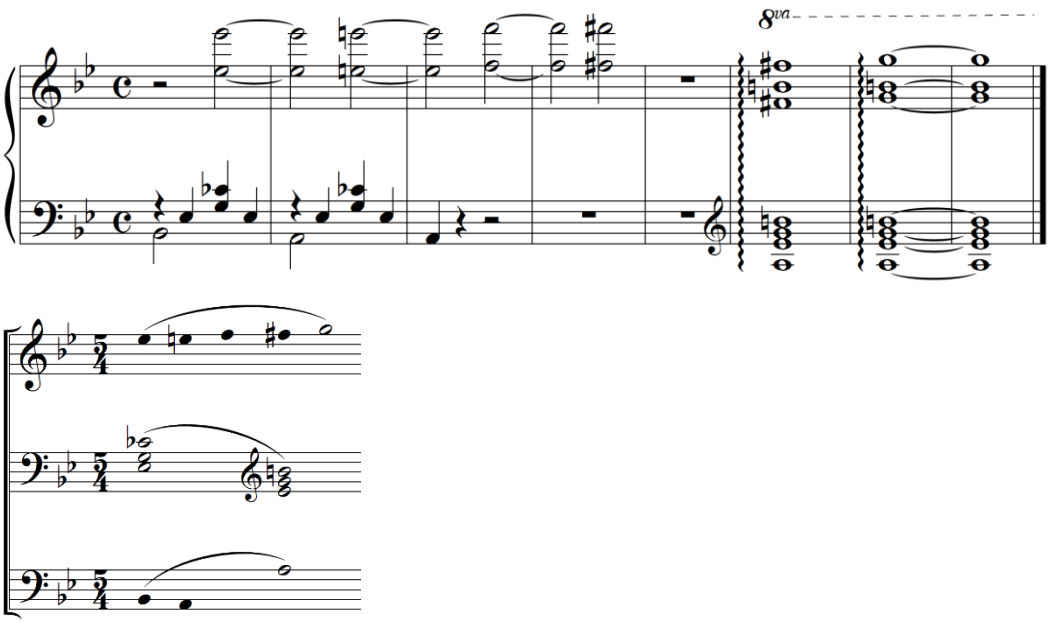

Figure 1.8: *The final bars of Lizts' Trübe Wolken (1881), and the three-part segmentation of the texture implied by Caux's disscusion.*

Though Caux concerns himself with a very specific slice of repertoire, his study elaborates a notion crucial to establishing a generalized model of layered musical construction: *layers assuming a degree of independence need not be clearly tonal, or strongly express a referential pitch class*. Rather, the stratification he identifies in Figure 1.8 arises out of combining layers that merely imply distinct teleologies. The lack of terminology specific to this type of situation ("stratification" has too broad a meaning) is addressed by the differentiation model in Chapter 2. More importantly, this study, through focusing on more abstract means of separating out layers from each other than setting them in different keys, prompts reflection concerning what different types of means for achieving this separation exist more generally. Answering this broad question, if only partially, lies at the heart of the work of Chapter 2.

Following *Polytonalités,* the most recent significant study to emerge in the Francophone sphere is the 2013 book by Philippe Malhaire *Polytonalité: des Origines au Début du XXIe Siècle, Exégèse d'une Démarche Compositionnelle*.[35] Malhaire provides a historical and theoretical overview of polytonality, along with a rudimentary analytical notation that extends Milhaud's catalogue of triadic combinations. This notation proves useful in describing diatonic, strongly triadic textures,

[35] Philippe Malhaire, *Polytonalité: des Origines au Début du XXIe Siècle, Exégèse d'une Démarche Compositionnelle* (Paris: Harmattan, 2013).

and excerpts by Milhaud and Koechlin effectively provide most of the material for the analytical section of the book.[36] Figure 1.9 illustrates his analysis of the opening of *Sorocaba* from Milhaud's *Saudades do Brasil*; Malhaire argues that the right shifts to and from the B-flat major of the left hand..[37]

[36] "Analyse," *Ibid*., 121-208. Also featured are excerpts by Ravel, Bartók and Schnittke, among others. Malhaire's analytical notation functions much like an extension of traditional roman numeral analysis, labelling each layer's harmonic function separately; correspondences to Milhaud's catalogue of triadic combinations are also indicated between each set of two layers. The limited scope of this notation unfortunately restricts its use to excerpts which make use of functional triadic harmonies—those that are polytonal in the strictest sense of the term.

[37] Figure 1.9 reproduced from *Ibid*., 171-172.

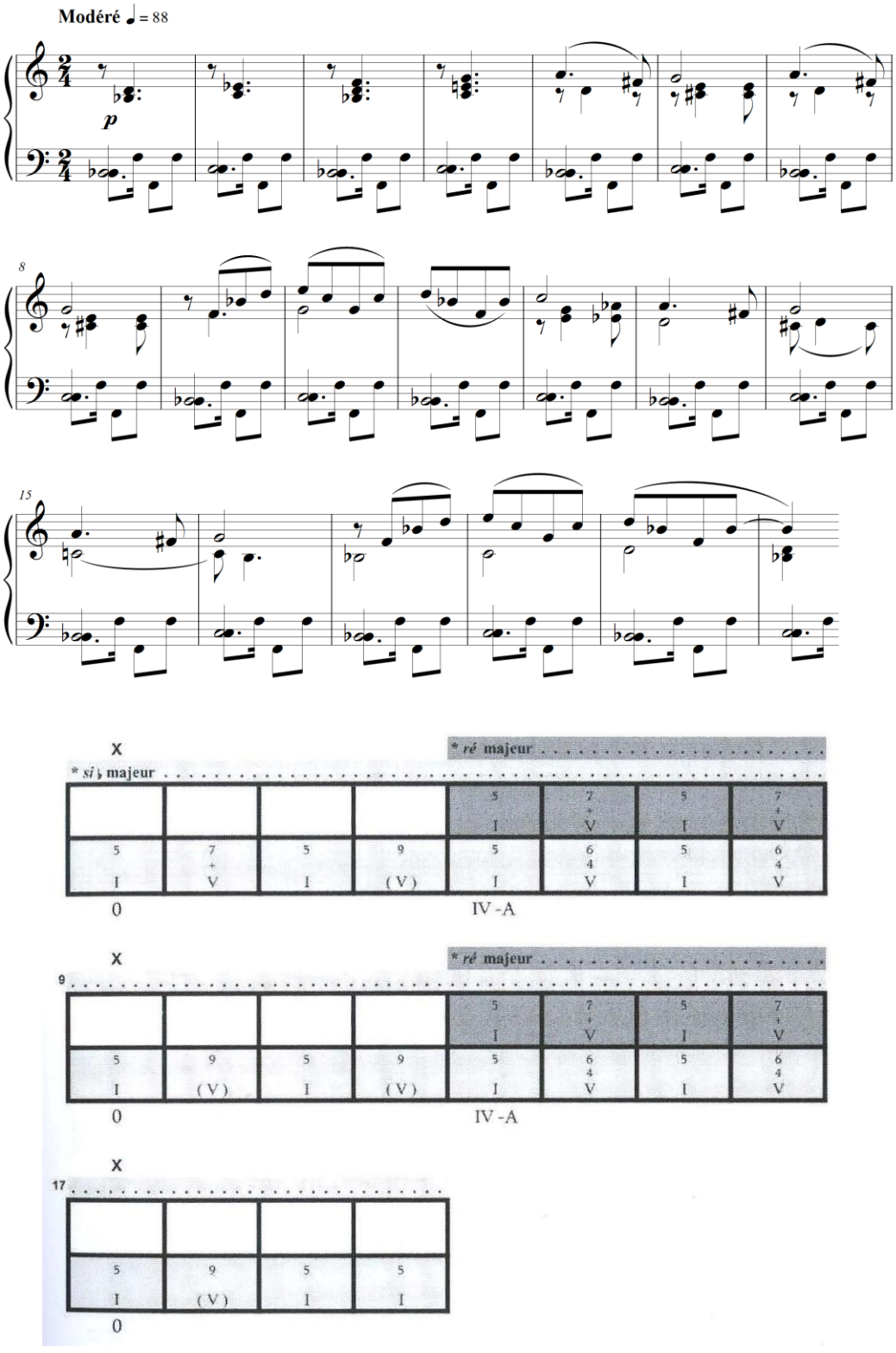

Figure 1.9: *Malhaire's polytonal analysis of "Sorocaba" from the Saudades do Brasil. Reproduced with permission from L'Harmattan.*

Much of *Polytonalité* is not composed of wholly original research, but rather of synthesis and paraphrase of previous work; most of the research published in *Polytonalité/Polymodalité* and *Polytonalités* is cited, along with the author's previous monograph, *Polytonalité: Étude Historique, Théorique et Analytique*.[38,39] Nevertheless, of particular note in this volume is Malhaire's attempt to provide a concise set of well-defined terms that describe types of layered musical construction, most being formed by prefixing "poly-" to a theoretical term already in common use. Sifting through previous research, he selects no less than ten "poly-isms" for use over the course of the ensuing study.[40] Listed and further described in Annex I, these are:

- *Polymusic* ("Polymusique");
- *Polysystem* ("Polysystémie");
- *Polytonality in the broad/strict sense* ("Polytonalité au sens large/strict", adapted from the work of de Médicis);
- *Polydiatonicism* ("Polydiatonie");
- *Polymodality* ("Polymodalité");
- *Polyscalarity* ("Polyscalarité");
- *Polylinearity* ("Polylinéarité");
- *Polymelody* ("Polymélodie");
- *Polyharmony* ("Polyharmonie");
- *Polyfunction* ("Polyfonctionnalité").

This list decisively illustrates the terminological fragmentation affecting the field. Not only does each term a different configuration of how layers are expressed and superimposed, but the meanings of these terms also overlap in a variety of ways, making reaching a more global understanding of how they fit together quite difficult.

Malhaire attempts to surmount these difficulties and clarify these overlaps of meaning in an ambitious diagram provided as an annex to the book, reproduced in Figure 1.10; however, what emerges here is rather a sense of confusion due to inadequacy of representation.[41] One wonders why, for example, polytonality in the strict sense stands completely distinct from tonality (perhaps a better choice here would have been "monotonality" or "unitonality"); or perhaps why "polydiatonicism", the combination of melodic lines expressing different diatonic collections, does

[38] Philippe Malhaire, *Polytonalité : Étude Historique, Théorique et Analytique*, Tempus Perfectum 6 (Lyon: Symétrie, 2009). References to "*Polytonalité*" apply not to this monograph, but to *Polytonalité: des Origines au Début du XXIe Siècle, Exégèse d'une Démarche Compositionnelle*.

[39] Though *Polytonalité* seems to bring little new material to the table, it does prove compelling as an introductory summary of a larger corpus of more in-depth research.

[40] "Refonder la Théorie Polytonale," in *Polytonalité*., 23-54.

[41] Figure 1.10 reproduced from *Polytonalité*., 323.

not intersect "polymodality"—the church modes of course allow for centricity and a diatonic collection to be expressed. More concretely, the diagram makes no distinction between matters of style, compositional technique and pitch syntax. "Polymusic"—the combination of lines so stylistically different such that they *are perceived* as belonging to separate pieces of music entirely—effectively makes no statement whatsoever concerning the syntax of its constituent parts, whereas "polyfunctionality"—the combination of different tonal functions belonging to a singular key—concerns entirely syntactical matters, with no regard to style. Figure 1.10 in fact stands as an illustration of the main problem plaguing current research: terminological saturation, fragmentation and imprecision.[42]

[42] Rather than delve further into each term represented here, I leave it to the reader to consult Malhaire's own definitions along with Annex I if interested. More relevant is that the long list of words—and cluttered diagram it goes with—stands as a compelling prompt for developing a model that obviates the need for such a dense terminological environment, and provides a simpler, more universal descriptive language..

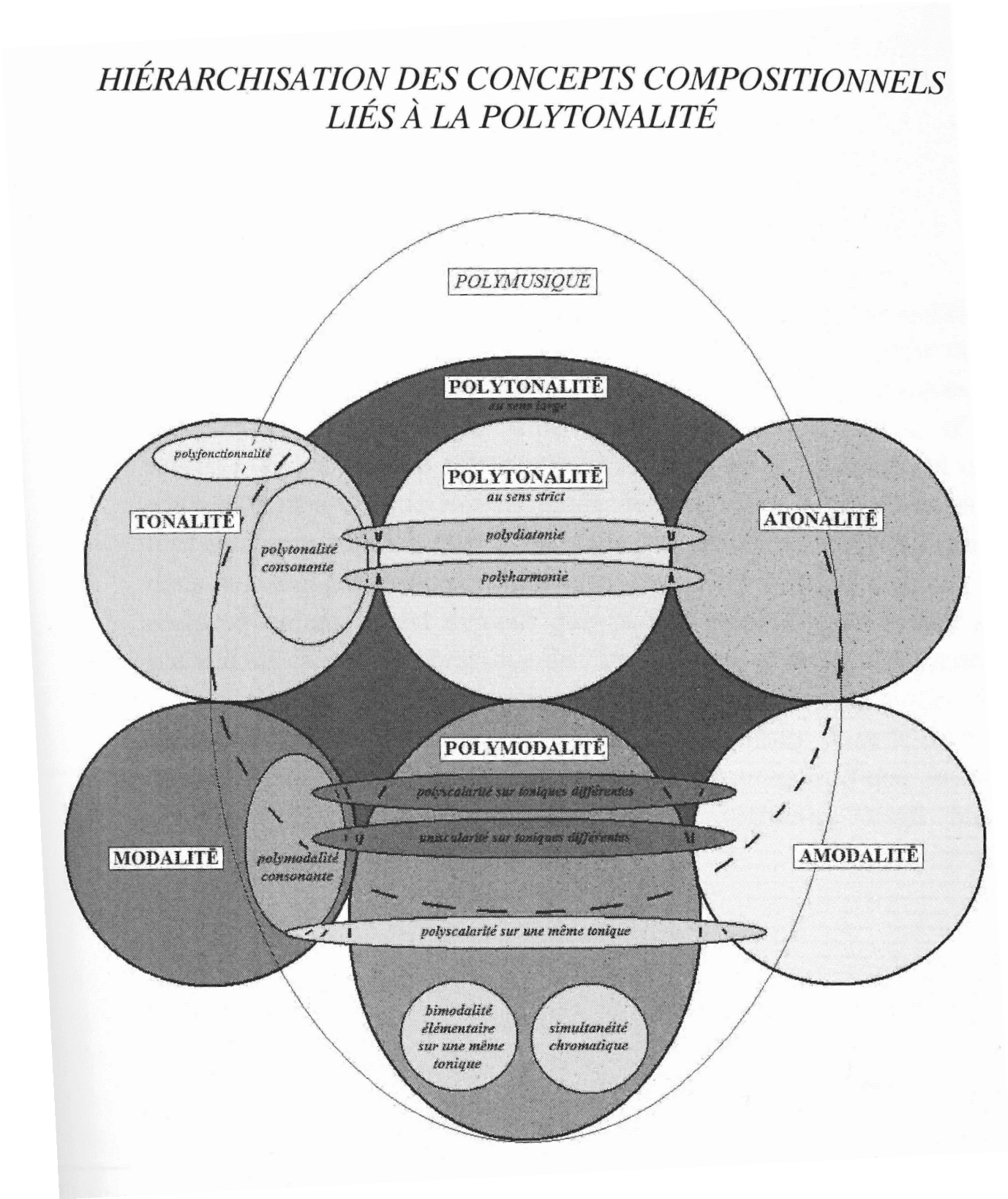

Figure 1.10: *Malhaire's diagram of terminological overlaps.Reproduced with permission from L'Harmattan.*

Rejection of Polytonality in Anglophone Theory

While polytonality has proven to be an object of serious interest by the Francophone scholars discussed above, certain Anglophone theorists (some of whom have been important figures in the establishment of the discipline in North America) have rejected the notion outright, deeming it of little conceptual legitimacy or analytical use. Theorist and composer Milton Babbitt (of considerable reputation as the "founder of music theory"[43]) writes, in a 1949 article examining thematic and polyphonic procedures in Bela Bartók's string quartets:

> "From his thematic assumption arises Bartók's polyphony, every line of which is a thematic variation and expansion, progressing tonally in terms of the successive elaborations of the tonal area controlled by single thematic elements. At the same time, the polyphonic lines are coordinated and given unified harmonic direction through the relationships existing among the simultaneously elaborated central tones. This procedure often appears to be an organic employment of what has been mistermed 'polytonality,' a self-contradictory expression which, if it is to possess any meaning at all, can only be used as a label to designate a certain degree of expansion of the individual elements of a well-defined harmonic or voice-leading unit."[44]

Babbitt here implicitly argues that the prefix *poly-* is conceptually incompatible with the word *tonality*, and that the entire expression must be semantically diluted ("if it is to possess any meaning at all") in order to be understood. Nevertheless, this diluted meaning still supposes a type of layered construction, which Babbitt acknowledges: Bartók's lines, though drawing from a singular melodic (intervallic) source, still establish a certain degree of autonomy, with each line developing the source material in a unique way.

Allen Forte, writing in 1955, adopts a similar perspective in the context of Stravinsky's *Petrouchka* and the traditional perception of its famous chord as implying two distinct keys (as shown in Figure 1.2). He argues that, despite certain passages of the work featuring lines that each express a distinct referential pitch, describing them as polytonal proves counterproductive:

[43] See Robert Morris, "What Milton Babbitt Enabled," *Music Theory Spectrum* 34, no. 1 (Spring 2012): 19–21.
[44] Milton Babbitt, "The String Quartets of Bartók," *The Musical Quarterly* 35, no. 3 (July 1949), 379-380.

> "[The establishment of separate linear systems] results in tensions between the individual lines, thus providing a compositional resource of great potential. The term does not imply the existence of simultaneously unfolding 'separate' tonalities—a logical contradiction—for a tonality, by definition, requires the ascendancy of a single tone. Even separate successive tonalities, each defined by its own tonic-dominant function, do not occur in *Petrouchka.* Instead, there are specific single tones which generate lines. These lines are extended by the use of the techniques described in this section."[45]

Babbitt's earlier remark about the contradiction inherent in the word "polytonality", echoed by Forte, now begins to come into focus: for these authors, "tonality" requires one single pitch class to achieve syntactic dominance over the entirety of the musical texture. From this point of view, superimposing lines that, taken on their own, each express themselves tonally paradoxically renders the whole effectively non-tonal; the possibility of "the ascendancy of a single tone" has been eliminated by the combination of musical strands that refuse to enter into a coordinated relationship to one tonic.

In an ambitious 1972 article dealing with the methods, motivations and ultimate goals of music analysis, theorist Benjamin Boretz takes a more semantic tack.[46] Boretz argues that, in grappling with music that does not operate according to a thoroughly systematized, well established syntax (a circuitous reference to common-practice tonality), analysts often attempt to adapt existing terminology to the new repertoire, in the hopes of identifying gestural similarities with the canonical repertoire that transcend style and particularities of pitch language. Using existing terminology in this way neglects the specific musical characteristics that it nominally indicates (in favour of focusing on general gestural impressions)—which, Boretz argues, robs words of a part of their meaning. This phenomenon affects words such as "cadence". Its theoretical meaning as applied to classical-period works invokes a specific set of tonal voice-leading motions and harmonic procedures; however, when one attempts to use it in the context of non-tonal music, only a general impression of finality—a vaguely-defined concept—remains. Boretz extends this phenomenon to cases where existing terminology is *modified*, effecting similar dilution of meaning and loss of precision. Such modifications bring a well defined term into contact with a contradictory semantic extension.[47] Boretz cites "polytonality" among examples of this process:

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[45] Allen Forte, *Contemporary Tone-Structures* (New York: Teachers College, Columbia University, 1955), 137.

[46] Benjamin Boretz, "Meta-Variations: Part IV, Analytic Fallout (I)," *Perspectives of New Music* 11, no. 1 (Fall-Winter 1972): 146–223.

[47] *Ibid.*, 148-151.

> "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."[48]

Boretz's argument further clarifies the implicit logic motivating Babbitt's and Forte's commentary. By appending the prefix *poly-* to the word "tonality", one commits a semantic misstep: the complex pitch relationships involved in tonality are annihilated, leaving behind a haphazard sense of lines each loosely implying a musical syntax that cannot be accomplished on the whole. For these theorists—whose interpretation of the term, it should be pointed out, feels more literal than most—polytonality proves too paradoxical an idea for inclusion among useful analytical descriptors.

Rejection of polytonality also characterizes a number of studies of Stravinsky's oeuvre that focus on the octatonic scale as a unifying principle. In this respect, Arthur Berger's 1963 article, "Problems of Pitch Organization in Stravinsky," proves foundational.[49] Berger first notes that, at the time of publication, theorists had done little work on "twentieth-century music that is centric (i.e. organized in terms of tone center) but not tonally functional."[50] Considering Stravinsky's music fertile ground for such research, he selects a set of short passages, interpreting their construction as either diatonic, octatonic or based on a mixture of both scale-types. While Berger's discussion of diatonic passages proves interesting in its own right (he goes to great terminological lengths to avoid any historical connotations or references to tonal function[51]), his discussion of octatonic passages has emerged as more relevant to later research as shall be discussed further below.

Berger's work essentially involves segmenting the musical surface into chunks expressing a given octatonic collection. This segmentation allows one to analyze how Stravinsky realizes the

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[48] *Ibid*., 149.

[49] Arthur Berger, "Problems of Pitch Organization in Stravinsky," *Perspectives of New Music* 2, no. 1 (Fall-Winter 1963): 11–42.

[50] *Ibid*., 11.

[51] Berger eschews traditional labels for diatonic modes, preferring to use its starting pitch-class in the white-note collection to indicate collection-type and its actual starting pitch-class to indicate transpositional level; "C Phrygian" effectively becomes "The E-scale on C". He states: "'D-mode', 'E-mode', etc. rid modern modal nomenclature of extraneous historical implications; and by simple substitution of 'scale' for 'mode' (e.g. 'D-scale') we, in turn, may derive a nomenclature that analogously circumvents the implications of 'modality,' both modern and archaic." See "Problems of Pitch Organization in Stravinsky," 17.

structural potential of the octatonic collection, and to identify pitch classes within it that may emerge as referential. While the finer details of octatonicism are not so relevant here, Berger's interpretation of the *Petrouchka* chord illustrates his argument that, though polytonality should not be considered a useful analytical concept, individual layers of an octatonic texture may still imply distinct central pitch classes.[52] He effectively argues that the structure of the chord exploits the relationships between the pitch classes of the C-D-flat octatonic collection, with two interpretations possible:

- In the first case, the chords represent an abstract, non-tonal superposition of major triads, exploiting the octatonic collection's capacity to produce two such chords a tritone apart (Figure 1.11a). C and F-sharp, as the two triadic roots in play, compete for the status of referential pitch.
- In the second case, the chord represents a combination of two [023] trichords sourced from the octatonic collection (Figure 1.11b).[53] C and F-sharp compete for the status of referential pitch as the "centres" of each trichord.

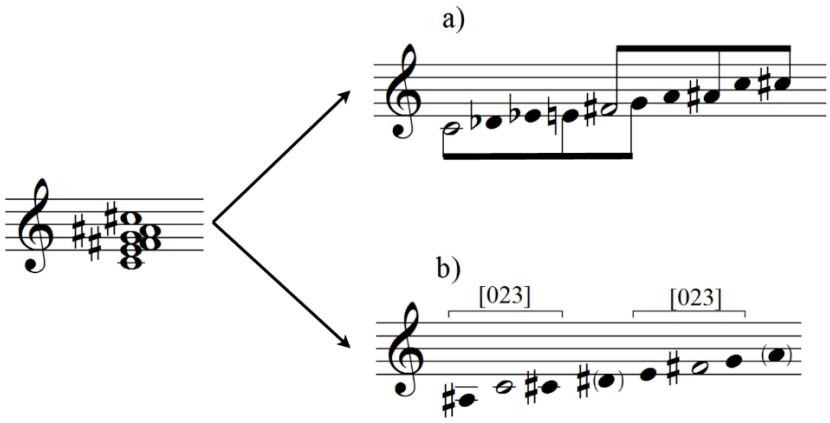

Figure 1.11: *Berger's octatonic interpretations of the Petroushka chord.*

Berger states that the chord thus contains the energy of two competing "poles."[54] This notion does invoke a superimposition of referential pitches typically associated with polytonality; however, he

[52] The discussion of the Petrouchka chord and Figure 1.11, which reflects it, occurs in "Problems of Pitch Organization in Stravinsky," 22-26.

[53] Figure 1.11b is adapted from "Problems of Pitch Organization in Stravinsky," 25 (Example 9b).

[54] Discussing Stravinsky's comments on the Petroushka chord, Berger speaks of "the special properties of the tritone which make it possible for pitches at 0 and 6 (capable of graphic representation as "poles" in a circle of fifths, whether or not one accepts the assumption on which this circle is predicated), by virtue of similitude or equal and thus independent weight, to remain in equilibrium or—to the end that a tone center is asserted by neither—to stand in a certain opposition." *Ibid.*, 25.

argues that the unifying power of octatonicism obviates the need for polytonal considerations of any kind:

> "To regard C-F♯ of the interlude as a foreshadowing of the '*Petrouchka* chord' is to admit some evidence for the standard interpretation of this configuration as a confluence of two sub-complexes 'based' on these two pitch classes, rather than as a unitary sonic event[…] However, since the entire configuration may now be subsumed under a single collection with a single referential order, i.e. the octatonic scale, the dubious concept of 'polytonality' need no longer be invoked; nor does such an interpretation make it impossible to acknowledge a certain compound nature of the configuration, since this can be done entirely within the referential collection of the octatonic scale, by means of the partitions."[55]

This commentary echoes the earlier implicit argument of Babbitt and Forte: while individual lines or parts within a musical texture may distinguish themselves from each other quite saliently, they cannot imply the simultaneity of two tonal centres and are best analyzed as coordinated expressions of a single phenomenon.

The later analyses by Pieter C. van den Toorn of Stravinsky's work build upon Berger's octatonicism. His significant 1983 volume, *The Music of Igor Stravinsky*, in fact relies upon identical core reasoning: that Stravinsky's work is best understood through the lens of the octatonic scale, as an exploration of its various structural potentialities.[56] It fleshes out the theory of octatonic poles, expands the notion of octatonic-diatonic interaction and delves into a wider range of repertoire (particularly Stravinsky's serial works). Concerning polytonality, van den Toorn echoes previous scholarship, though strengthening its language somewhat:

> "Furthermore, it is to be understood that questions regarding the 'bitonality' or 'polytonality' of certain passages in this literature can no longer be taken seriously within the context of this inquiry. Presumably implying the simultaneous (C-scale tonally functional) unfolding of separate 'tonalities' or 'keys,' these notions—real horrors of the musical imagination—have widely (and mercifully) been dismissed as too fantastical or illogical to be of assistance."[57]

Octatonicism similarly features in further studies by van den Toorn and Richard Taruskin.[58]

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[55] *Ibid.*, 22-23.

[56] Pieter C. Van den Toorn, *The Music of Igor Stravinsky* (New Haven: Yale University Press, 1983).

[57] *Ibid.*, 63-64. The phrase "Horrors of the musical imagination" appears earlier, in a prior article: Pieter C. van den Toorn, "Some Characteristics of Stravinsky's Diatonic Music," *Perspectives of New Music* 14, no. 1 (Fall-Winter 1975): 104–38. Elsewhere in *The Music of Igor Stravinsky*, van den Toorn uses the segment of the p. 105 quote that follows "horrors of the musical imagination," stating: "'bitonality' and 'polytonality' (the simultaneous unfolding of separate 'tonalities' or 'keys') have already been widely dismissed as too fantastic or illogical to warrant serious consideration." Emphasis mine. See *The Music of Igor Stravinsky*, xv. This description seems to have been colourful—and accurate—enough to be printed twice.

[58] Octatonicism forms the basic premise of the analyses in: Pieter C. van den Toorn, "Part I: Pitch Structure" in *Stravinsky and the Rite of Spring: The Beginnings of a Musical Language* (Berkeley, CA: University of California

More generally, Stravinsky's oeuvre has consistently served as a battleground between supporters and detractors of polytonality since the entry of the *Rite of Spring* onto the musical stage, with musicologists, critics, conductors and fellow composers alike weighing in.[59] Even the harsh criticisms discussed above, however, readily accept the more general notion of multiple, simultaneously occurring layers of music that each display some uniqueness of expression. Analytical concepts such as heterophony or octatonic poles effectively involve recognizing subsets of a texture working against each other; it appears to be only the term "polytonality" itself—ill-defined and potentially semantically inconsistent—that need be discarded.

Nevertheless, one senses in these analyses a strong desire to *unify* musical textures and minimize the independence of their constituent parts. The unifying power of Berger's and Van den Toorn's octatonicism has already been mentioned in the context of the *Petrouchka* chord; a singular conception of tonality similarly underpins the criticisms of Boretz and Forte.[60] These theorists' work largely turns away from discussing the details of layered musical construction in order to seek broader, overarching models that encompass the entirety of a composition—models connecting textural components strongly enough that divergences in their construction do not preclude them from being subsumed into a larger, singular whole.

Constructing a model that binds pitches and gestures together as purposeful, logically coherent expressions of a single core principle seems inevitable when one undertakes music-theoretical work. Effectively, a model makes it possible to rationalize and *explain* the construction of a given segment of music in a systematic way; this leads, one hopes, to an intellectually satisfying *understanding* of said music, and perhaps of some subconscious compositional process. In tonal theory, the search for said understanding reaches its most ambitious expression in the mature work

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Press, 1987), 133–215. As well as Richard Taruskin, "Chez Pétrouchka: Harmony and Tonality 'chez' Stravinsky," *19th-Century Music* 10, no. 3 (Spring 1987): 265–86.

[59] For a succinct overview of the debate more focused on critical and musicological accounts, see Marie-Cécile Barras, "Stravinski. De La Polytonalité À La Polymodalité Ou Les Avatars D'une Interprétation," in *Polytonalité/Polymodalité : Histoire et Actualité*, Conférences et Séminaires 21 (Paris: Université Paris-Sorbonne, Observatoire Musical Français, 2005), 53–62.

[60] Forte's research in particular shows a strong preference for the whole over its components. in *Contemporary Tone-Structures*, he analyzes a 1946 Milhaud song in quasi-Schenkerian fashion, focusing on a recurring (he argues, prolonged) C-E dyad and making little note of the overall harmonic divergence of melody and accompaniment that characterizes its style. See *Contemporary Tone-Structures*, 39-47. In his later study of Stravinsky's *Rite of Spring*, he similarly avoids discussion of layered construction, focusing on the relationships between pitch class sets obtained by considering entire textural chunks. See Allen Forte, *The Harmonic Organization of the Rite of Spring (New Haven, CT: Yale University Press, 1978).*

of Heinrich Schenker, whose *Ursatz* binds together all pitches of a work as elaborations of a single, conceptually prior triad.[61] While Schenker's model has had its internal logic criticized,[62] its absorption into the common music-theoretical vocabulary testifies to the power of its underlying unifying drive. Facing this axiomatic principle of theoretical models—that they be able to group musical events together in some way—a successful model of layered musical construction must then provide an alternate source of logical coherence, despite focusing on the differences between simultaneous musical events.

Layered Musical Construction in Recent North-American Music Theory

Turning to more recent research, one finds that theorists have begun to exploit the potential of recognizing independently operating musical entities, investing less energy into the whole of the musical texture while still steering clear of problematic terminology. Stravinsky's work nevertheless remains quite important as an object of analysis and debate. Dmitri Tymoczko, in his 2002 article "Stravinsky and the Octatonic: A Reconsideration," criticizes octatonicism, arguing against van den Toorn's work in particular.[63] Tymoczko proposes alternate interpretations of passages from Stravinsky's "Russian" ballets that, as opposed to assimilating the entire textures into expressions of octatonic scales, segment them into superimposed chunks of music expressing a wider variety of collections: the diatonic, octatonic, whole-tone, harmonic minor, melodic minor scales, or the chromatic collection outright. Figure 1.12 accordingly illustrates how Tymoczko interprets a quite complex excerpt from the *Rite of Spring*.[64] As a descriptor of these

[61] Heinrich Schenker and Ernst Oster, *Free Composition* (New York: Longman, 1971). See particularly "Part I: The Background," 1-21.

[62] See, for example: *Eugene Narmour, Beyond Schenkerism: The Need for Alternatives in Music Analysis* (Chicago: University of Chicago Press, 1977). Notably, though Narmour considers Schenkerian theory to be logically inconsistent, he does not attack the broader search for Unity in music analysis. His own implication-realization model in fact seeks out an even wider-reaching application to an even-wider range of works. Though the Ursatz is discarded here, the concept of a unifying core principle controlling musical content is part and parcel of Narmour's discourse.

[63] Dmitri Tymoczko, "Stravinsky and the Octatonic: A Reconsideration," *Music Theory Spectrum* 24, no. 1 (Spring 2002): 68–102. Of passing polemical interest are the response by van den Toorn and the counter-response by Tymoczko again; see the "Colloquy" later in the same issue, 167-202.

[64] Figure 1.12 reproduced from "Stravinsky and the Octatonic," 79 (Example 6h).

superimpositions, he coins the term "*polyscalarity*: the simultaneous use of musical objects *which clearly suggest different source-collections*."[65]

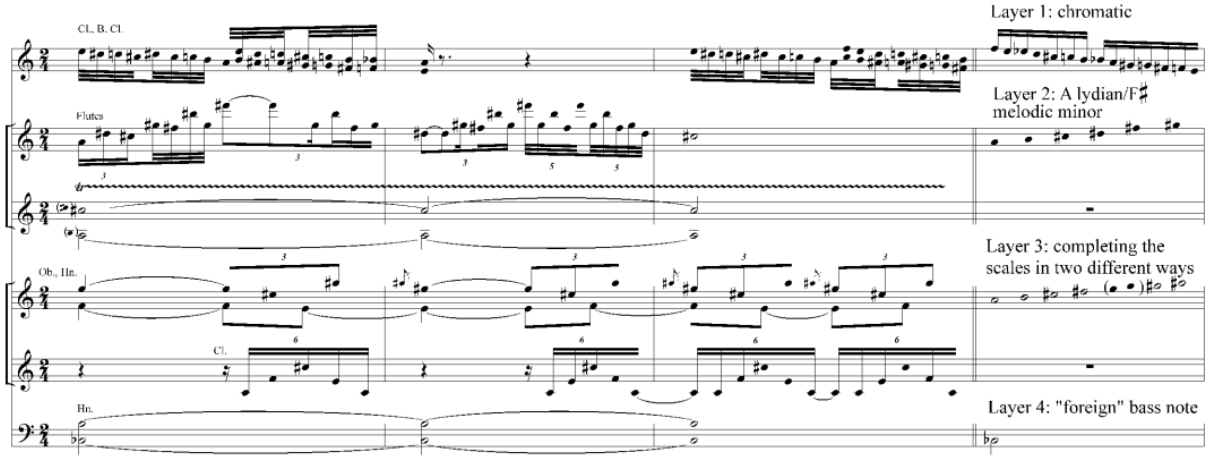

Figure 1.12: *Tymoczko's polyscalar segmentation of a passage from the Rite of Spring. Reproduced with the permission of Oxford University Press.*

As with the previous discussion of octatonicism, the specifics of Tymoczko's analyses are of less relevance than the broader ideas he espouses concerning layered musical construction. Particularly useful is the notion—also underpinning Caux's work on Liszt discussed earlier—that layers need not express a referential pitch in order to assume some degree of independence. Effectively, polyscalarity only denotes a combination of collections and makes no assumptions about whether or not a referential pitch may be identified. In this sense, it refers to a much wider range of situations than does polytonality. This broader conception of layered construction also circumnavigates criticisms of the admissibility of superimposed tonalities, though Tymoczko views the idea as legitimate.[66]

Joseph Straus, in a study from 2014, further discusses Stravinsky's music, but focuses on very specific, localized passages that nevertheless represent a broad sample most of the composer's output.[67] Straus argues that these passages are constructed with two textural components. Each spans a perfect fifth (generally associated with chordal writing) or fourth (generally associated with melodic writing) and fills it out using a particular scalar segment or set class. Straus introduces

[65] *Ibid.*, 84.
[66] *Ibid.*, 85-86.
[67] Joseph N. Straus, "Harmony and Voice Leading in the Music of Stravinsky," *Music Theory Spectrum* 36, no. 1 (2014): 1–33.

the term "bi-quintal structure" to refer to the resulting combination of harmonic and voice-leading processes. He further notes that the dissonances produced by combining two different fifths/fourths and filling them in differently gives rise to various amounts of tension, generating musical interest.[68] Most of the article consists of analyses; Straus identifies and demonstrates six models of bi-quintal structure, each numbered according to the interval class between the fifths/fourths expressed and possessing its own common harmonic and melodic fills.[69] Figure 1.13 illustrates one such model in the opening of the *Rite of Spring*.[70] Straus here sets off the bassoon line from the remainder of the ensemble, arguing that it diatonically fills out an A-D fourth; meanwhile, the ensemble fills out the fifth between C-sharp and G-sharp using a pentatonic subset.

[68] *Ibid.*, 2-6.

[69] Straus provides a comprehensive chart of 95 analyses performed as preliminary work for the article; see "Harmony and Voice Leading in the Music of Stravinsky," 7.

[70] Figure 1.13 reproduced from "Harmony and Voice Leading in the Music of Stravinsky," 3 (Example 2).

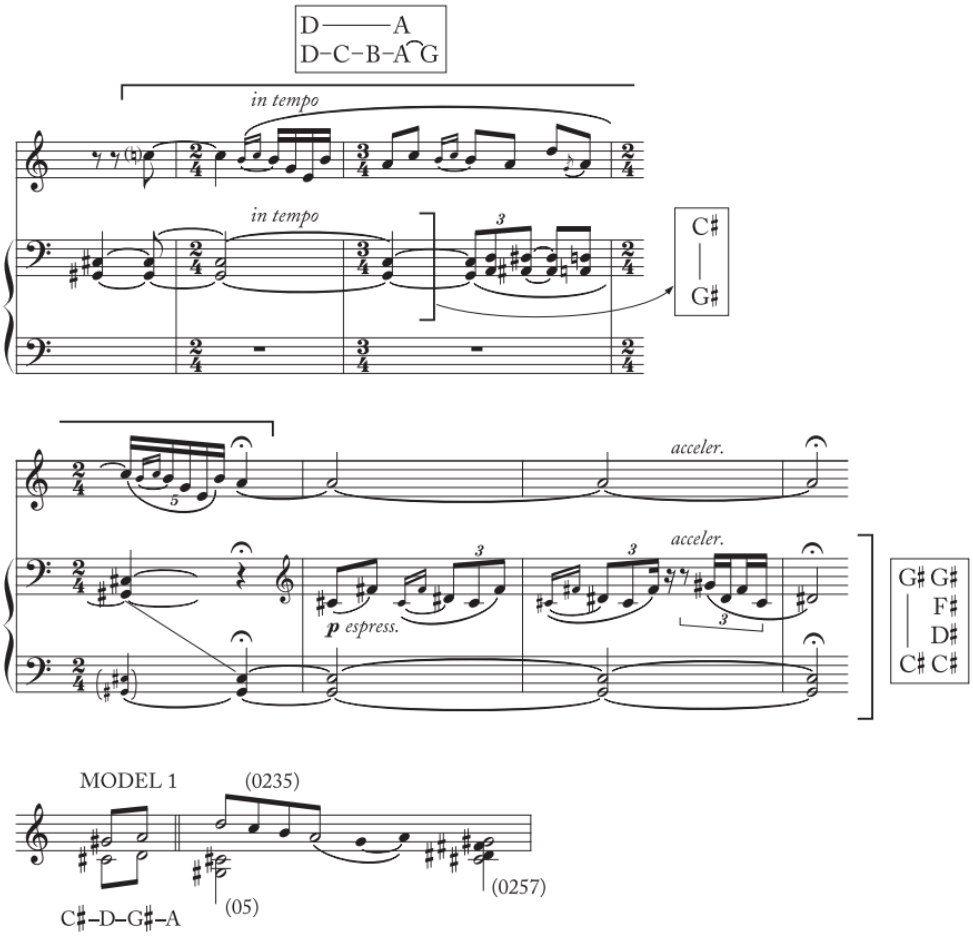

Figure 1.13: *Straus' interpretation of mm. 6-12 of the Rite of Spring. The top staff (the bassoon solo) outlines a D-A fifth, while the other parts fill out a C-sharp - G-sharp fifth. Each fifth is filled out with a different set class. Reproduced with the permission of Oxford University Press.*

Lynne Rogers, in her 1992 article "Dissociation in Stravinsky's Russian and Neoclassical Music," provides what is perhaps the most generalized description of processes of superimposition in Stravinsky.[71] She describes the titular phenomenon of *dissociation* as a combination of textural separations and divergences in pitch organization:

> "This technique [of juxtaposition in the vertical dimension], which I term *dissociation*, is based on the superimposition of distinctive, harmonically independent layers of musical material. In order to be independent harmonically, a layer must exhibit a self-sufficient pitch organization, generally not sharing the following elements with simultaneously sounding strata: pitch-class collection, pitch-class centricity, order of pitch-class presentation, characteristic simultaneities, and register."

[71] *Lynne Rogers, "Dissociation in Stravinsky's Russian and Neoclassical Music," International Journal of Musicology* 1 (1992): 201–28.

Rogers' analyses effectively focus on the ways in which layers distinguish themselves from one another according to the list of characteristics she provides. Her comments on the generalities of dissociation prove extremely insightful; I refer to her developments throughout in chapter 2.

While Tymoczko and Straus widen the scope of research into layered musical construction by according greater focus to collections, approaches based on specific pitches have also proven fruitful. Philip Rupprecht, in his 1993 dissertation "Tonal Stratification and Conflict in the Music of Benjamin Britten," focuses on the expression of diverging referential pitch classes, as well as conflicts between differently inflected pitches and clashing linear progressions in textures by Britten.[72] Like many contemporary theorists, Rupprecht consciously abandons the term "polytonality," noting its lack of satisfactory definition[73]; in its place, he defines the more specific concept of "tonal stratification":

> "A specific technique, *tonal stratification*, describes how oppositions between more than one tonal process are defined by a clear division of registral space into discrete layers of activity—*strata*. Tonal stratification presents a dissolution of the homogenous tonal and textural space of common-practice tonality. The simultaneous existence of parallel textural layers is common to many idioms: the familiar melody-plus-accompaniment texture, for instance. In Britten's works, such textural strata are no longer integrated within a single harmony, as in conventional tonality. Instead, there is a bold opposition of tonal centers, each associated with a different register."[74]

Rupprecht, much like Rogers, makes a number of more general statements about the interactions between musical layers that prove extremely relevant to the work of Chapter 2. While the initial examples he studies are quite straightforwardly illustrated by quasi-Schenkerian graphs, later chapters of the dissertation delve into quite intricate relationships: his analysis of the first movement of the *War Requiem* calls upon pitch class set and transformational theory in order to identify similarity relationships enabling a convincing segmentation of the musical texture.[75] The use of distinctly *non-tonal* modes of analysis in this analysis stretches the definition of tonal stratification considerably; as in Caux's work on Liszt discussed previously, here it seems that strata may distinguish themselves by adopting different trajectories (whether they be functionally

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[72] Philip Ernst Rupprecht, "Tonal Stratification and Conflict in the Music of Benjamin Britten" (Ph.D. Dissertation, Yale University, 1993).

[73] "But I would note the extent to which 'polytonality' serves as a catch-all category, tending to obscure exploration of less tangible (and more interesting) analytic issues." *Ibid.*, 58.

[74] *Ibid.*, 1-2. Of significance here is that Rupprecht's definition of tonal stratification intertwines divergences in tonal syntax and separation in register; effectively, it quite explicitly requires strata to be registrally distinct. I discuss the relationship of register to stratification further in Chapter 2.

[75] "Conflict as Premise: The First Movement of the War Requiem," *Ibid.*, 230-318.

tonal, or for example, based on pitch-class inversion around a given axis). Nevertheless, Rupprecht's model of tonal stratification proves quite powerful thanks to its ability to handle an broad range of types of pitch organization.

More recently, Peter Kaminsky, in the 2004 article "Ravel's Late Music and the Problem of 'Polytonality,'" discusses a subset of Ravel's works in which, he argues, it is possible to identify two competing "tonal foci," expressed in registrally separated textural layers.[76] Unsurprisingly, Kaminsky quickly abandons the term "polytonality," referring rather to the broader notion of superimposition. Additionally, he argues that superimposed layers rarely assume equal importance to the listener; rather, he assigns primary and secondary priorities to them based on the specifics of their presentation both on the musical surface and on a deeper structural level. Layers occupying the bass register, however, are accorded an initial textural preference; Kaminsky considers that the upper voices of a texture, when suggesting a different tonal space than the bass, must fight an uphill battle to establish themselves as tonally independent, let alone establishing primary priority.[77]

Kaminsky's notion of multiple priorities, and his attempt to provide a stable methodology for hierarchizing them, raises certain questions concerning the overarching issue of how analysis relates to listening. Considering competing layers of music and attributing priority to one of them, a process engaging quite deeply with the issue of music perception, certainly has precedent in the "hard" theoretical literature—the classic discussion of the establishment of metrical patterns by Lehrdal and Jackendoff may be cited here.[78] Nevertheless, the question of whether theoretical devices and analyses must rely on outwardly perceptible phenomena can be brought to bear on the notion of dual priority, and indeed on the phenomenon of layered musical construction in general. Kaminsky himself, though pointing out that research on the perceptibility of polytonality remains

[76] Peter Kaminsky, "Ravel's Late Music and the Problem of 'Polytonality,'" *Music Theory Spectrum* 26, no. 2 (Fall 2004): 237–64.

[77] Kaminsky outlines his approach in "Ravel's Late Music," 238-241. See also the following statement from 260-262: "Given that the source of the controversy is in large part terminological, I have chosen to abandon 'polytonality' in favor of superimposition with the possibility of a primary and secondary tonal focus."

[78]See the establishment of "metrical well-formedness rules" and "metrical preference rules" in Fred Lehrdal and Ray Jackendoff, "Metrical Structure," in *A Generative Theory of Tonal Music* (Cambridge, Mass.: MIT Press, 1983), 68–102. One notes that, like Kaminsky, Lehrdal and Jackendoff accord slight preference towards the bass voice over others when establishing primacy; see metrical preference rule #6 in *A Generative Theory of Tonal Music*, 87-88.

sparse, cites studies by Thomson and Mor[79] as well as Krumhansl and Schmuckler[80] in support of the idea; to this, one may add recent research by Hamamoto et al.[81] suggesting that listeners, both trained and non-trained, are able to perceive some measure of disconnect between layers set in different keys. At the very least, it appears that the idea of layered musical construction has a verifiable basic degree of legitimacy, regardless of its status in the world of music analysis.

Towards a Model of Layered Musical Construction

Having reviewed some of the more significant research on layered musical construction, then, the next step consists of setting out what exactly a convincing model for it should achieve. Addressing problems in the literature is a primary concern; past research on the subject effectively suffers from a number of flaws, partly terminological and partly methodological. The analyst is confronted with an overwhelming number of terms to choose from, ranging from "poly-"isms having no universal, specific definition to more complex descriptors from more recent research that have only been applied to a limited set of works by a single composer. Furthermore, theorists disagree on the legitimacy of certain types of layered construction, citing semantics or seeking models that aim to unify a texture as completely as possible. One also notes the considerable methodological fragmentation of the field, with analysts using tools ranging from quite traditional roman-numeral analysis to pitch class set theory. Considering the entirety of the previous discussion, then, I consider that a more generalized model of how musical layers interact should:

- Provide a *limited, consistent* and *well-defined* set of terms in order to remedy the current terminological saturation, particularly avoiding appending the prefix *poly-* to existing terms in common usage;
- Encompass a broad range of pitch languages, ranging from quite strict tonal expressions of referential pitch classes to quite abstract outlining of different collections;

[79] William F. Thomson and Shulamit Mor, "A Perceptual Investigation of Polytonality," *Psychological Research-Psychologische Forschung, no. 54 (1991): 60–71.*

[80] Carol L. Krumhansl and Mark A. Schmuckler, "The Petroushka Chord: A Perceptual Investigation," Music Perception 4, no. 2 (Winter 1986): 153–84. See also L. Carol Krumhansl, "Perceiving Multiple Keys: Modulation and Polytonality," in *Cognitive Foundations of Musical Pitch*, Oxford Psychology 17 (New York: Oxford University Press, 1990), 213–39.

[81] Mayumi Hamamoto, Mauro Botelho, and Margaret P. Munger, "Non-Musicians' and Musicians' Perception of Bitonality," *Psychology of Music* 38, no. 4 (2010): 423–45.

- Distinguish between matters of syntax and those of style, providing separate descriptors for each;
- Provide unity and logical coherence despite dealing with divided, contrasting elements.

In response to the aforementioned issues and equipped with these goals, then, I set out a model of *differentiation of concurrent musical strata* in the following chapter.

Chapter 2 : The Differentiation Model

Looking back on the literature reviewed in chapter 1, one notes that, despite many scholars criticizing polytonality, none reject the idea of a musical texture being divided into aurally separable layers—rather, they aim to discard tonal connotations, and conduct analysis of textures under the principle that they represent a singular, unified pitch-organizational whole.[82] The language associated with polytonality is effectively too loaded for "from scratch," nontonal analyses that might integrate independent musical layers into their theoretical outlook.

The model I set out in this chapter aims to address this problem, starting from the premise that layered *hearings* can lead to layered *analyses* without recourse to existing *poly*-isms. Representing a generalized analytical tool built from the ground up, it sidesteps the existing heated semantic and theoretical debates in order to provide a model capable of integrating all existing points of view. Using excerpts from canonical common-practice and polytonal repertoires as a starting point, I construct a model that treats parameters of pitch and textural organization as separate entities, each subject to diverging configurations across musical layers.

Theoretical foundations: differentiation and stratification

The initial modelling step consists of establishing a solid terminological basis. Common to all the terms discussed in Chapter 1 is reference to an *analytically and aurally identifiable* disconnect between two or more textural layers. The perception of this disconnect—its aural effect—is best described by the term *stratification*. Terms such as "polytonality" effectively invoke the superimposition of multiple *strata*, each expressing its own, distinct yet internally-consistent set of comprehensible pitch relationships. These strata combine simultaneously, thus being *concurrent*. Finally, stratification as described above occurs when each strata highlights its individuality and independence, by putting differences in how they are built front and centre. I describe this phenomenon as *differentiation*: the process by which musical events distinguish themselves from each other through divergences in construction. The model I construct below thus

[82] I briefly discuss further implications of the Petroushka chord, related to this idea, in the Annex.

addresses *differentiation of concurrent musical strata.* This set of terms ("strata/stratification" as well as "differentiation") has been used previously by both Lynne Roger work and Philip Rupprecht, whose work I discuss in Chapter 1.[83] Additionally, Danièle Pistone employs the phrase "differentiated strata" in her overview of Koechlin's works and writings.[84]

The cause-and-effect relationship between differentiation and stratification conceptually underpins the *differentiation model,* whose basic structure is depicted in Figure 2.1. With this causal principle in mind, then, I conceive of the terms discussed in Chapter 1 as labels indicating different configurations of differentiation: each term effectively implies its own "flavour" of arrow between the top and bottom of Figure 2.1, with the strata involved being set against one another in a characteristic way (by key, mode, collection expressed, etc.). In order to quantify these *differentiating factors*, I begin by adopting a parametric view of how differentiation operates.

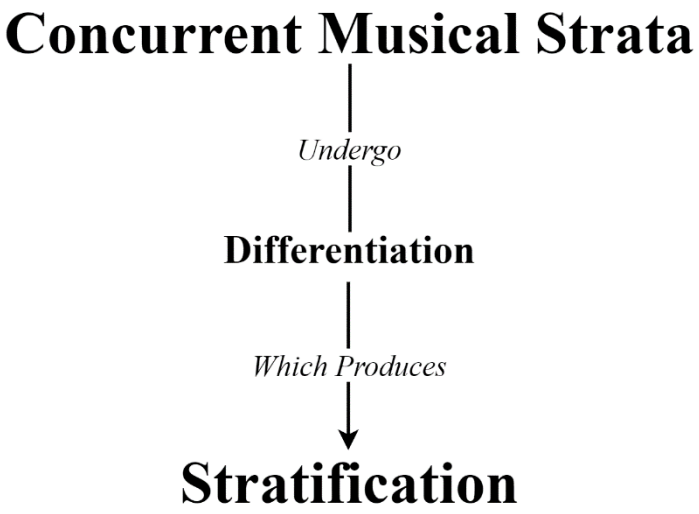

Figure 2.1: *The basic causal outline of the differentiation model*

[83] Rogers, though preferring the term "layers," refers to "Stravinsky's layered, or *stratified*, passages[…]". See Rogers, "Dissociation," 202.

[84] "Des strates différenciées peuvent faire croire à une présentation polytonale[…]," or "Differentiated strata may give a false impression of polytonality[…]" See Pistone, "La polytonalité selon Charles Koechlin," *Polytonalité/Polymodalité,* 123. The phrase is used here in a description of a Mahler excerpt which is given here as Figure 2.6.

Syntactic and statistical differentiation

Though the complications brought about specifically by the term "polytonality" have prompted construction of the differentiation model, the causal relationship between differentiation and stratification can operate in a much broader range of musical situations than those to which "poly"-isms generally refer. In fact, it is difficult to conceive of situations involving multiple concurrent musical voices in which some degree of stratification does *not* occur.[85] The simple case of traditional melody-and-accompaniment texture comes to mind. In Figure 2.2, the opening of a violin sonata by Mozart[86], an intuitive partitioning of the texture designates the violin as representing a "melody" stratum, with the piano representing "accompaniment" stratum. A more granular partitioning might separate the accompaniment into two sub-strata, "bass" and "chordal arpeggiation"; nevertheless, these sub-strata naturally pair together to create a larger unit by virtue of similarities in timbre, rhythm and textural role.[87]

[85] Monophonic textures essentially contain only one voice; thus, stratification becomes impossible.

[86] Mm. 1-4 of the first movement of the Violin Sonata in C Major, K.303 (1778).

[87] Both the bass and chordal stratification sub-strata can be understood as playing a "supportive" textural role. Knowledge of the classical-period style and the expectations associated with it inform this grouping to some extent; I address this issue further below.

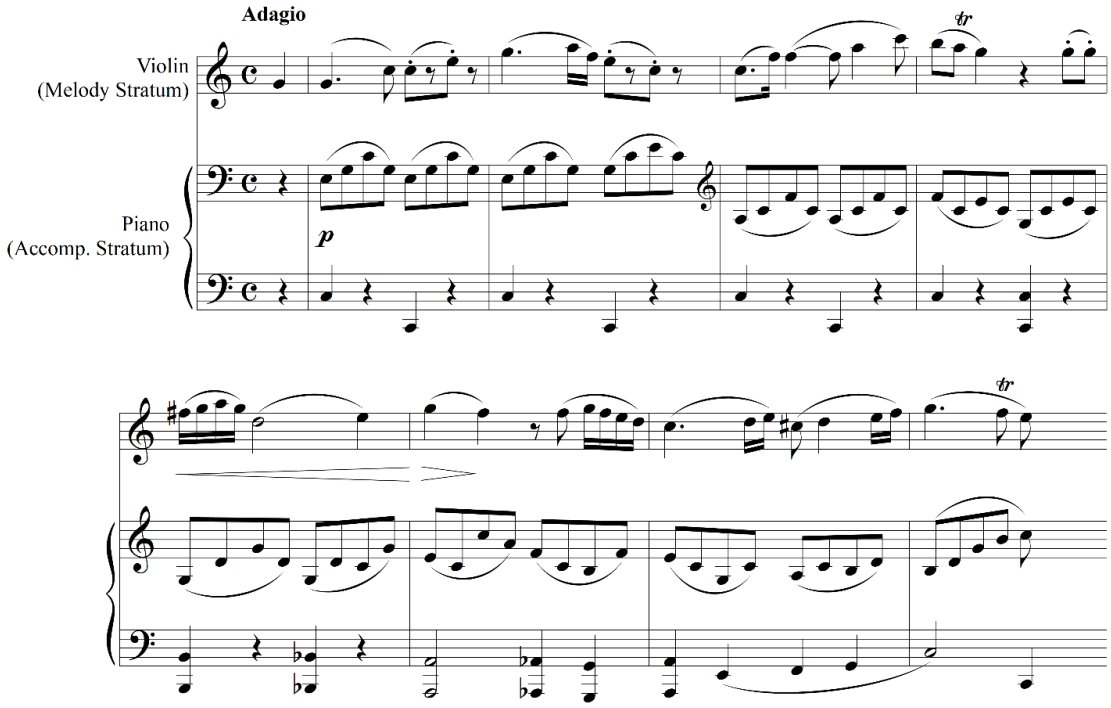

Figure 2.2: *Mozart, Violin Sonata in C Major, K. 303, opening of the first movement. A typical melody-and-accompaniment texture.*

Tonality unifies the texture of this passage, with all voices firmly set in C major; they also express the same harmonic function at a given moment. Nevertheless, one intuitively senses that the violin functions rhetorically differently than does the piano. Thus, despite the strong similarities between the construction of each instrument's line, differentiation still operates to provide each of them its own distinct character. In Figure 2.2, a number of differentiating factors can thus be identified:

- The melody and accompaniment strata occur in different instruments, producing a timbre contrast;
- The melody and accompaniment strata display different rhythmic profiles, with the former being more varied, and the latter being more repetitive.
- The melody stratum displays a characteristic melodic contour, while the accompaniment's chordal sub-stratum largely repeats a single arpeggiation pattern.
- The strata are set in different registers, with the melody always at least a third above the highest note of the accompaniment.
- While the accompaniment presents all the diatonic scale degrees involved in each harmony that occurs, essentially laying out the entirety of the harmonic framework governing the passage, the melody "singles out" individual scale degrees by virtue of its monophonic construction, which charts a unique path through said governing harmonic framework.

Figure 2.3 illustrates another type of differentiated context, that of a polyphonic composition. In this fugal exposition by J.S. Bach[88], the differences in timbre and textural role that characterized the previous example are largely absent; the three voices of the fugue are played on the same instrument, minimizing timbral contrasts. Nevertheless, they represent independent contrapuntal and textural strands throughout the exposition, with differentiation arising out of registral separation, rhythmic contrasts and—most importantly—each voice charting unique voice-leading motions through the overarching harmonic framework. While register contributes to differentiation largely as it did in the Mozart, rhythm and pitch organization operate differently. In Figure 2.2, the accompaniment stratum features generic rhythmic values coupled with a static presentation of the overall harmony. The melody stratum features characteristic rhythmic values and traces an active, specific path through the harmony, thereby distinguishing itself from the accompaniment through the specificity of its pitch choices. In contrast, the voices in Figure 2.3 all display similarly melodic constructions; they must consequently establish their contrapuntal independence by making sufficiently unique choices that they do not pair up with an adjacent voice. In the simplest possible terms, these paths can be represented as unrelated sequences of diatonic scale degrees. Differentiation in rhythm and register combines with the divergence in these sequences to create a stratified three-voice texture.

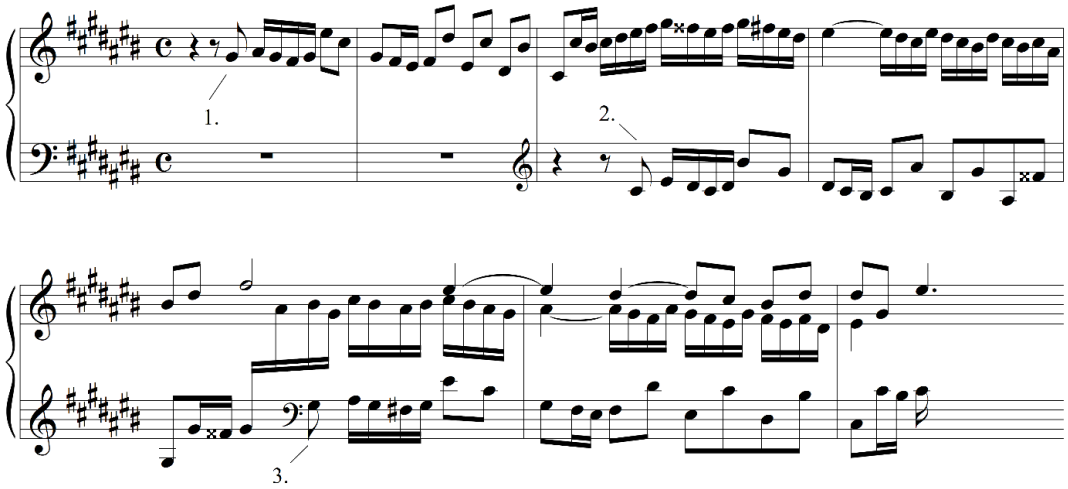

Figure 2.3 : *J.S. Bach, Fugue in C-Sharp Major, Exposition. Each of the three voices represents one textural stratum.*

[88] Fugue no. 3 in C-sharp major, from the *Well-Tempered Clavier*, Book 1 (1722).

Though the Bach and Mozart excerpts discussed above feature stratification, they nonetheless paint a coherent, functional harmonic picture. Common-practice harmony and voice-leading subordinate all simultaneously-sounding strata to a much more powerful overarching harmonic logic; the demands of a shared language effectively play an essential unifying role. In a polytonal context such as that of Figure 1.4, however, this overarching logic dissolves. Although the right and left hand parts of Milhaud's *Botofago* (already encountered in chapter 1) each follow a consistent tonal logic *internally*, they do not combine to form a coherent whole. Each hand occupies its own distinct tonal space (the left, F minor, the right, F-sharp minor), whereas those in Figs. 2.2-2.3 featured strata moving in distinct fashions *within the same tonal space*. This separation of tonal systems not only produces stratification, but pushes the strata apart so strongly as to create a palpable sense of systemic disconnect.

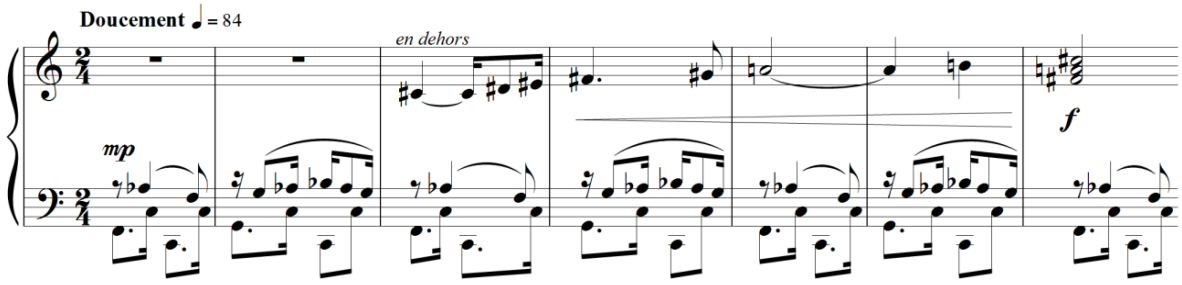

Figure 2.4 : *Opening of Milhaud," Botofago" from the Saudades do Brasil (1920).*

Across Figures 2.2-2.4, textural differentiating factors operate similarly, relying primarily on registral separation. However, considering pitch organizational factors, the polytonality of the Milhaud excerpt engages much stronger divergences in construction; the combination of two separate keys stands out against the much subtler differences in voice-leading behaviour of the Mozart and Bach excerpts. Though the stratification in all three pieces results from superimpositions of unique pitch-organizational decisions, the strata in the unitonal excerpts operate *within* a single, limited set of possible pitch relationships, all referred to one tonic and scale. In contrast, the strata of Milhaud's "Botofago" each carry their own entirely separate pitch-organizational baggage.

Previous research by Leonard Meyer provides a basis for meaningfully categorizing these differentiating factors and for specifying how they differ from each other. In his 1998 article "A Universe of Universals," Meyer argues for the universality of certain basic human reactions to

sound, attempting to identify constants in the experience of listening to and understanding music that transcend problems of culture, style, historical period, and so on.[89] Of particular relevance here is Meyer's categorization of musical parameters into two classes based on the way in which they are processed by the listener: *syntactic* and *statistical*.[90] Syntactic parameters are those whose constituent parts may be discretely segmented into elements that have the ability to express themselves functionally, thereby generating musical syntax.[91] Statistical parameters are those whose constituent parts are unable to undergo this process, being instead understood as lying somewhere on a continuum of "more" or "less." Because of their continuous nature, Meyer argues that statistical parameters are unable to enter into well-bounded functional categories, and thus do not carry a significant amount of syntactical weight.[92] He divides parameters into these two categories as follows:

Syntactic Parameters	**Statistical Parameters**
• Pitch (at the source of scales, harmony, *etc.*); • Duration (at the source of rhythmic groupings, metre *etc*.).	• Timbre; • Dynamics; • Tempo (as in, the perception of music moving "faster" or "slower").

Table 2.1 : *Musical parameters divided into syntactic and statistical categories.*

This division of musical parameters integrates quite smoothly into the differentiation model, allowing for a more detailed description of the differentiating factors in play. Figure 2.5 adds the syntactic/statistical division to the structure of Figure 1.1, and lists a (non-exhaustive) number of differentiating factors operating within each parameter.[93] The statistical factors of Figure 2.5 are organized somewhat differently than in Table 2.1; I group together dynamics, instrumentation and registral placement as constituent parts of a larger category.[94] Additionally, I provide a number of

[89] Leonard B. Meyer, "A Universe of Universals," *The Journal of Musicology* 16, no. 1 (Winter 1998): 3–25.

[90] *Ibid.*, 8-10.

[91] *Ibid.*, 8. Meyer describes these relationships as those of "functional differentiation," referring to the notion that, for a syntax to emerge, its elements must distinguish themselves from each other such that they express their own unique, logically-abstracted function—as opposed distinguishing themselves primarily acoustically, as in the case of statistical parameters.

[92] *Ibid.*, 9-10.

[93] The syntactic/statistical divide offers a framework within which existing theoretical terminology can operate; beyond providing an illustrative list of parameters and laying out a basic set of parameters of pitch organization below, a thorough examination of the ways in which music can be parametrized is out of scope.

[94] Timbre itself changes with dynamic level, mode of articulation, and so on. All three of these parameters form part of what could also described as "sound colour."

possibilities for aspects of pitch organization that may form the basis for differentiation; as I focus the bulk of my attention on these in chapters 1 and 3, I provide detailed definitions and examples for each of them in Annex I.[95]

Turning back to Figures 2.2-2.4, then, we can now describe their similarities and differences regarding stratification using the specific terminology of the differentiation model:

Statistical differentiation

- All three examples bring into play differentiation of register.
- All three examples employ differentiation of timbre as a byproduct of registral contrasts. The timbral contrast between strata is most pronounced in the Mozart, however, where each stratum is assigned to a different instrument.
- While the Bach exposition features three voices whose textural roles are conceptually equal, Mozart and Milhaud both employ distinct textural roles of melody and accompaniment, assigning one to each of two strata.

Syntactic differentiation

- All three examples feature strata that use different combinations of durational values; however, no conflicts of metrical structure are to be found that would engage a larger syntactic divergence of modes of rhythmic organization. [96]
- The Mozart and Bach examples do not feature differentiation of pitch organization. Their strata only trace out different paths within a singular, unambiguous, unified tonal space.[97] While differences in melodic contour and scale-degree focus do rhetorically contribute to stratification, these differentiated elements find themselves subsumed into a larger whole expressing only one pitch syntax. Only the Milhaud excerpt features this type of differentiation: in the opening of *Botofago*, differentiation operates most prominently through *referential pitch* in combination with *collection*, producing a tangible syntactic disconnect between strata not observable in the Mozart and Bach.

[95] As I focus generally on differentiation based on parameters of pitch organization here, I leave deeper consideration of rhythmic organization and statistical parameters open for further study.

[96] The rhythmic configuration of these three examples is comparable to the pitch organizations of the Mozart and Bach, in that separate voices trace different gestural paths through an overarching metric structure that remains unified. A rough analogy to the superimposition of diverging tonal centres in the Milhaud would be the combination of distinct metrical grids, or different tempi (with associated subdivisions) entirely.

[97] This is not to say that the tonal space itself is static; modulation effectively involves a concerted effort on behalf of all strata to displace it.

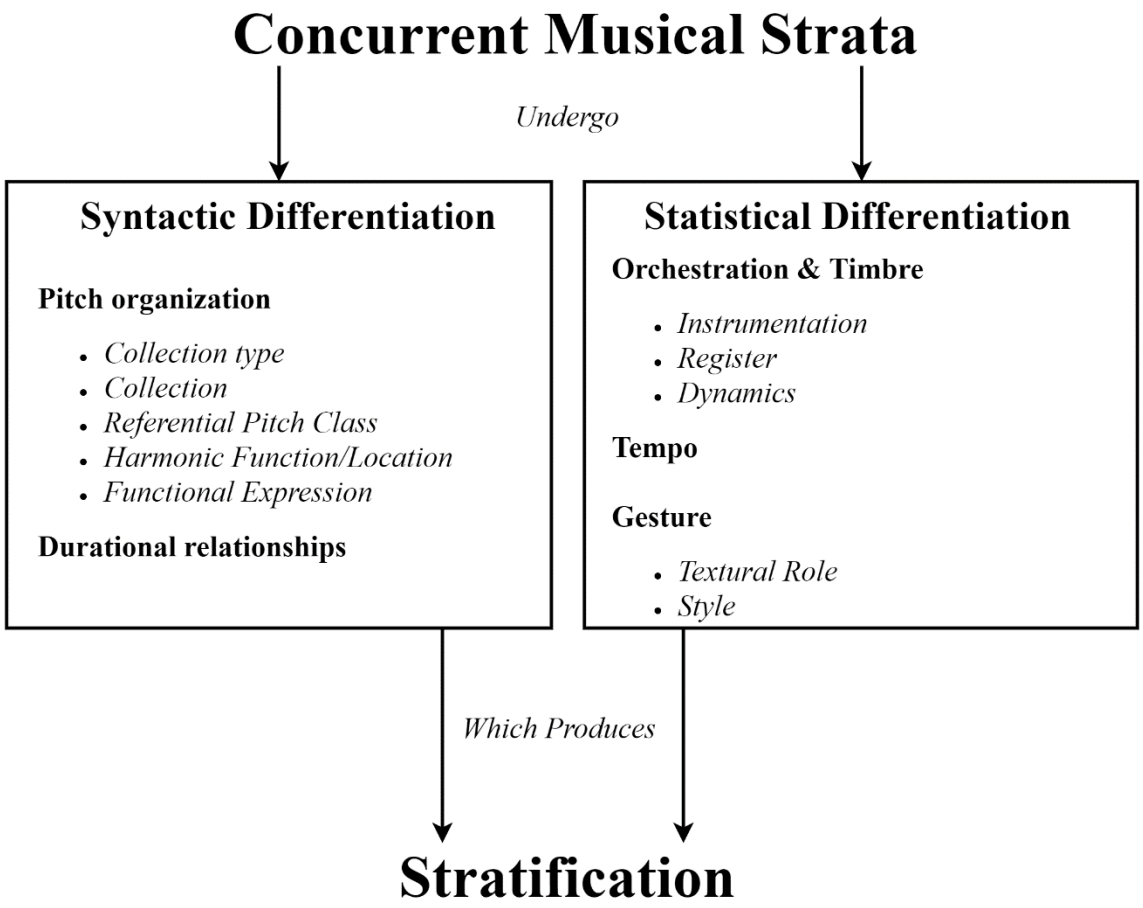

Figure 2.5: *Integrating the distinction between syntactic and statistical differentiation into the differentiation model.*

While most of the parameters displayed in Figure 2.5 operate quite straightforwardly, the statistical differentiating factors of textural role and style prove trickier to deal with. A potential criticism of including these in the differentiation model might point out that these terms are quite broad and fuzzily defined: there exists no definitive list of textural roles or musical styles, and I effectively avoid attempting to quantify either parameter in the following sections, considering questions of style analysis especially to lie outside the scope of the current discussion. Nevertheless, I find it intuitive to include these factors in the differentiation model, particularly since descriptive constructions such as "melody and accompaniment," which feature an inbuilt distinction between what each element of the texture "is doing," occur so ubiquitously in musical discourse. In the context of establishing a flexible descriptive model and in the interest of maintaining scope, I consider an intuitive understanding of the generalities of style and textural role sufficient grounds

for their inclusion. Perhaps simplistically, style may can be considered an *emergent property*[98] of parametric combinations, effectively becoming more than merely the sum of its parts.[99] In considering statistical differentiation, the jarring effect of superimposing incompatible styles can produce a strong sensation of disconnect, particularly when combined with prominent clashes of referential pitch. The third movement of Mahler's First Symphony (1889), excerpted in Figure 2.6, contains an example of statistical differentiation that cancels the effect of a unified whole *without* recourse to extending syntactic differentiation beyond the bounds of simple diatonicism and common-practice tonality.[100]

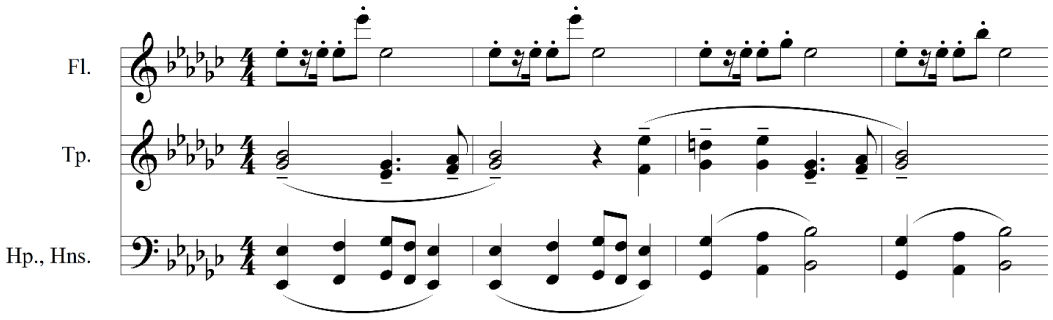

***Figure 2.6** : Mahler, First Symphony (1889), Third Movement (rehearsal 15). A stratified texture without syntactic differentiation.*

One may also hypothesize that differentiation by means of pitch organization is necessary to create a palpable sense of disconnect between musical layers, and that such disconnects, along with this specific type of differentiation, do not occur extensively in common-practice music save for a few historical oddities.[101] Nevertheless, independence of pitch organization does not appear to be a *prerequisite* for strongly stratified textures[102] Considering then that differentiation by means of

[98] The *Encyclopedia of Philosophy* describes emergence as "broadly speaking, the fact that there are features of the world—objects, properties, laws, perhaps other things—that are manifested as a result of the existence of other, usually more basic, entities but that cannot be completely reduced to those other entities." See Paul Humphreys, "Emergence," *Encyclopedia of Philosophy* (Detroit: Macmillan Reference USA, 2006). 190-194.

[99] As Leonard Meyer points out, style cannot be defined solely by identifying statistically dominant musical configurations and combinations of events; questions of style effectively engage larger cultural and historical issues. See Leonard Meyer, "Towards a Theory of Style," *Style and Music: Theory, History and Ideology* (Chicago, University of Chicago Press, 1989), 1-37. Particularly 10-12.

[100] Malhaire supplies this passage as a replacement for a previous article illustrating this very point—see *Polytonalité*, 42-43 and Pistone, "La Polytonie selon Charles Koechlin," 123.

[101] Notably, the two (perhaps now tired) examples of the polytonal "Die Liederliche Gesellschaft von Allerley Humor" from a *Batallia* (1673) of Heinrich Biber, and the ending of the last movement of Mozart's *Ein Musikalischer Spaß,* K. 522. See Milhaud, *Polytonalité*, 212-215; 265-284 for a broad overview of the development of "canonical" polytonality in the early twentieth century.

[102] Rogers makes the point in the context of early Stravinsky—see "Dissociation," 203.

pitch organization does not represent the sole factor responsible for sharp perceptible disconnects between strata, I add a third element to the differentiation model: *intensity of stratification*.

Intensity of stratification

Syntactic and statistical differentiation exist in a deeply symbiotic relationship to one another. Both must necessarily combine in meaningful amounts to create textures that can be readily understood as stratified. Consider a situation where syntactic differentiation is almost nonexistent: a flute and clarinet—timbres quite close to each other—both play a melodic fragment at the unison (Figure 2.7a), This configuration makes separating the timbres from each other extremely difficult; moreover, that they each are assigned the same melody prompts us to categorize them as "doing the same thing." More distant timbres may be combined to allow for distinguishing of individual instruments, replacing flute and clarinet with oboe and harp; however, the total effect achieved then becomes that of two different instruments "doing the same thing." They still combine into one stratum, though now one with somewhat more complex inner workings. In order to achieve a noticeably stratified texture, the two instruments must effectively diverge in some syntactically relevant fashion. One could double a melody at the third or sixth, inducing differentiation of location within a collection (Figure 2.7b). The result remains quite unified by virtue of the use of parallel intervals, lack of rhythmic differentiation, and the use of a single diatonic collection; yet, separating the texture into two distinct components now becomes possible. Effectively, for statistical differentiation to produce stratification, it *must* combine with some form of syntactic differentiation, no matter how weak.

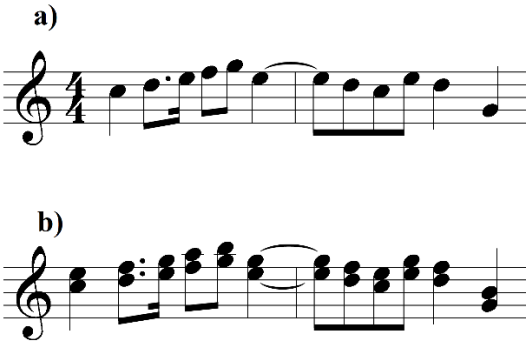

Figure 2.7 : *A sample melody, first alone, and then doubled in thirds to provide possibilities for stratification.*

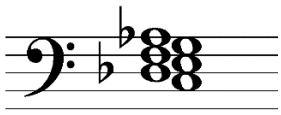

Figure 2.8 : *A triadic superimposition that minimizes stratification.*

The reverse proves equally true. As pitched musical objects exist in register, produced by timbre-bearing instruments, generating stratification through syntactic differentiation requires the concomitant use of statistical differentiation. Figure 2.8 illustrates a situation where a lack of statistical differentiation inhibits a stratified hearing; combining two major triads a minor second apart. Using a single timbre (a piano, for example) to set this chord produces a tone cluster—not a perceptible combination of two distinct harmonies. Here, though the sonority was originally conceived as a superimposition of two distinct chords, its realization offers too little in the way of statistical separation for a differentiated reading to be analytically and perceptually intuitive. Addition of timbral differences (setting one triad in double reeds and the other in strings, for example) would bring the intended separation into focus, as would the use of greater registral separation.

Existing research supports the necessity of clear statistical differentiation—particularly in the domains of register and timbre—to creating meaningfully stratified textures. Albert Bregman notes in *Auditory Scene Analysis* that listeners intuitively group (integrate) sequences of pure tones into two conceptually independent (segregated) streams when said tones occupy non-overlapping frequency bands.[103] A similar process is shown to operate when complex tones with differently-weighted harmonic spectra—different timbres—alternate.[104] Later analyses in musical contexts point towards perceptual principles underlying the use of timbral, rhythmic and intervallic contrasts to reinforce the distinction between independent lines.[105,106]

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[103] This corresponds to the "Proximity" rule of sequential integration: Albert Bregman, *Auditory Scene Analysis: The Perceptual Organization of Sound* (Cambridge, Mass: MIT Press, 1990), 196-198.

[104] *Ibid.*, 96-103.

[105] *Ibid.,* 464-465, 471-474. Bregman devotes a section to counterpoint, and how individual voices or instruments in an ensemble may set themselves apart perceptually from others; see 490-528.

[106] A related question of compositional interest: Can musical contexts and cues *prompt* a listener to attempt a stratified parsing of a texture where they may not have intuitively sought to do so otherwise? Consequently, do certain compositional choices enhance stratification not through activating purely perceptual phenomena, but by engaging learned notions of style or rhetoric? Bregman dedicates a chapter to discussing *schema-based* integration and segregation, in which listeners interpret stimuli in an intentional, as opposed to passive and neutral, way. Fittingly, listeners instructed to listen for two independent streams of notes in the context of the experiment referenced in

At the opposite extreme, syntactic and statistical differentiation may both exist *in excess*, particularly when a large amount of independent strata coexist simultaneously. Milhaud, in *Polytonalité et Atonalité*, argues that saturation results from excessively dense layering, ascribing an "atonal harmonic result" to the excerpt from his *Troisième Symphonie* reproduced in Figure 2.9.[107] In this example, a superimposition of straightforwardly diatonic melodies makes up the total texture; however, their amount is simply too great for all of them to be heard simultaneously. Rather, the total effect is intensely chromatic; while one diatonic line can easily be "picked out" of the texture, its background remains too dense for a tonal parsing.

Effectively, in both edge cases of insufficient and excessive amounts of syntactic and/or statistical differentiation, stratified constructions cease to be musically meaningful. In the former case, a sense of unity arises out of similarity or sparseness: the differences are too few or too weak for a stratified reading to generate meaningful analytic information. In the latter, the network of differences becomes too dense, and saturation results, with the individual parts of the texture collapsing onto one another. At both extremes of density, then, the *intensity* of stratification—that is, how clearly the separation of layers is understood as well as the magnitude of the distance between them—remains rather low. More conservative combinations of differentiation strata, perhaps counterintuitively, result in higher intensity of effect.[108] Figure 2.10 adds a spectrum of intensity of stratification to the differentiation model reflecting this notion; the conceptual maximal amount of separation lies on the middle of a curve that trends towards unity on the left, and saturation on the right.

Footnote 103 required a much smaller distance between the two groups to achieve segregation than those instructed to listen for a single stream. See 406. The potential importance of listener intent in perceiving component parts of a texture as independent may serve as a basis for research into the role of style and musical context play in the understanding of musical textures.

[107] Figure 2.9 reproduced from Milhaud, *Polytonalité et Atonalité*, 184. "des agégations de notes inanalysables *et dont le résultat harmonique est atonal*."

[108] Perhaps relevant here is David Huron's set of experiments on voice denumerability; see David Huron, "Voice Denumarability in Polyphonic Music of Homogenous Timbres," Music Perception 6, no. 4 (Summer 1989): 361–82. While Huron's conclusions are not generalizable to works featuring sharp timbral differences or syntactic divergences, they support the notion that a greater number of textural components decrease the individuality of each; more information leads to a higher chance of saturation.

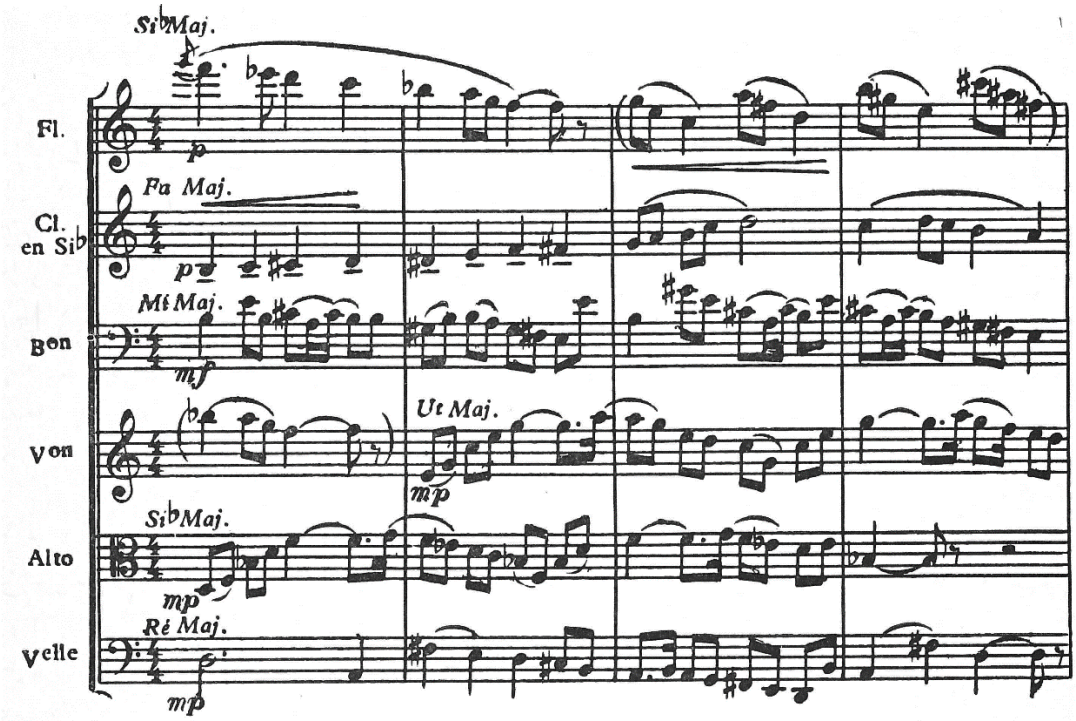


Figure 2.9 *: Excerpt from Milhaud, Troisième Symphonie de Chambre (1921). The overabundance of diatonic lines leads to saturation. Excerpt reproduced from Flammarion under fair use.*

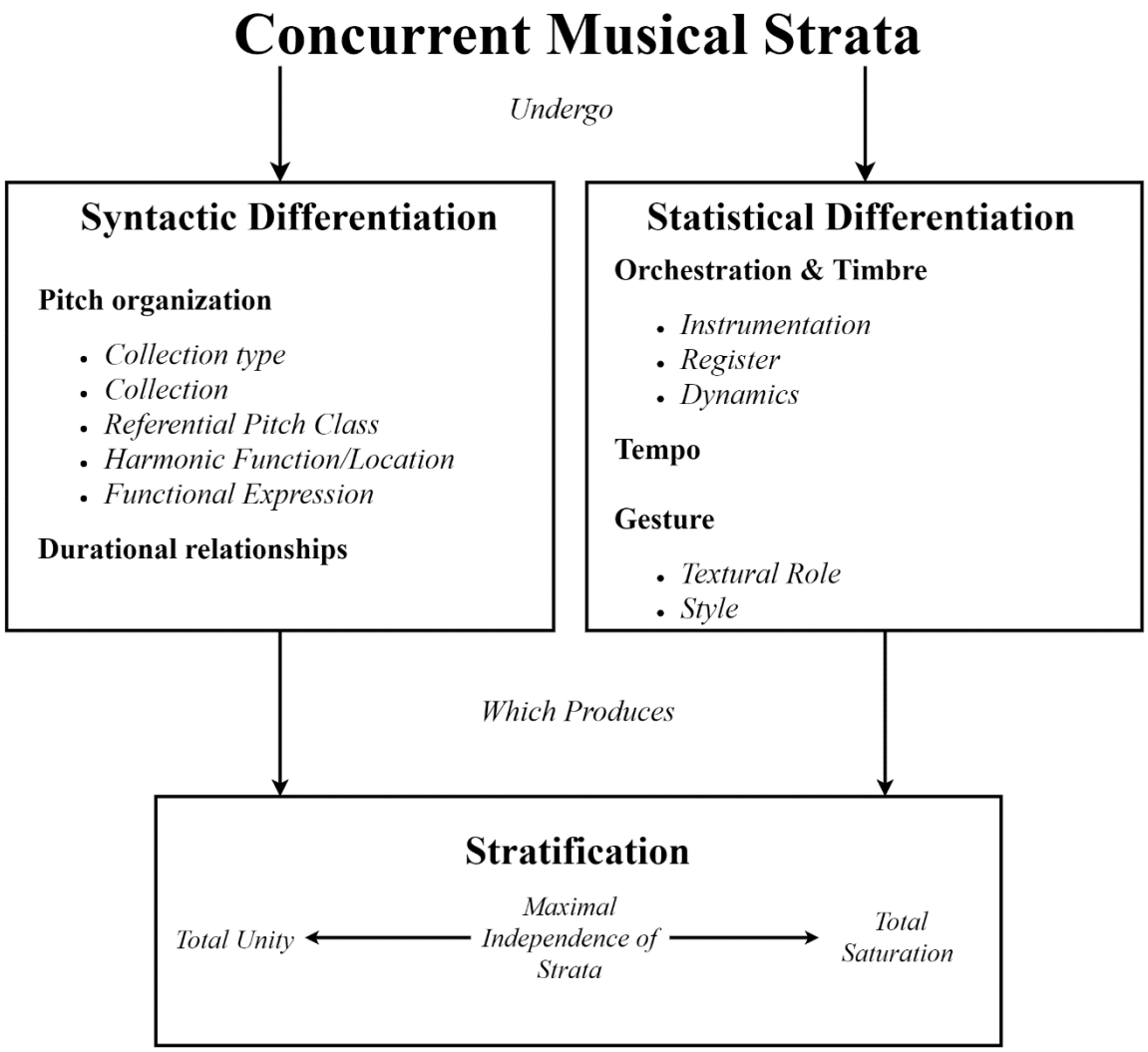


Figure 2.10 *: Complete diagram of the differentiation model, with intensity of stratification.*

At this point, I have largely steered clear of the question of priority. Conceptually, understanding one strata as more salient or aurally dominant represents a different process than acknowledging and quantifying the way in which this strata might establish syntactic independence relative to others. However, as Kaminsky argues in his work, aural preference for the bass voice in certain situations encourages a hearing in which the upper voices struggle against being understood as harmonically subordinate.[109] This observation has syntactic ramifications in that, depending on the

[109] Kaminsky, "Ravel's Late Music," 240-41.

upper voices' success or failure at detaching themselves, analytic preference is given to stratified or unified readings respectively.

Dealing with the issue of perception more broadly, it is important to highlight that the differentiation model connects directly with our aural experience only at the stage where a stratified texture is heard, and qualified as more or less intense. As mentioned previously, differentiating factors assume meaning through possessing analytic relevance—by providing insight into divergences in construction or conception. In this way, analyzing *differentiation* represents a more abstract analytic process, distinct from the description of the its aural result (*stratification*). This distinction should inform use of the differentiation model; it functions as an analytic tool that can provide insight into the construction of layered textures when doing so serves a meaningful analytic purpose. It does not mandate seeking out differentiation; rather, it stands as a potential option in the theoretical toolbox.

Ultimately, the main rationale for establishing the differentiation model has been to provide a consistent, more universal terminology for describing and analyzing layered musical construction. Its basic outline separates stratification—a heard result—as a consequence of differentiation. In this way, it integrates layered hearings with layered analyses, without conflating the two or allowing terminological overlap. Furthermore, adopting a parametrized view of the mechanics of differentiation allows a broad range of pitch syntaxes to be analyzed, allowing for the language of the model to exist independently of style. A limited set of parameters translates to an equally limited set of terms, each assigned their own specific, non-connotative meaning. Fleshing out the model further, the following section provides definitions and examples of syntactic differentiating factors, while the Annex looks back on some of the terminology encountered in Chapter 1 through this new terminological lens. Meanwhile, in Chapter 3, I provide three analytical overviews of excerpts from the literature as a demonstration of ways in which the differentiation model may be used.

Glossary of Differentiating Factors Concerning Pitch Organization

As described previously, stratification arises out of combinations of *differentiating factors*. In the following glossary, I define each pitch organizational parameter that may represent such a factor. I discuss each parameter in isolation, considering the case wherein all *other* parameters of pitch organization remain unified, or are not relevant.

Collection Type

Strata differentiated by *collection type* diverge in the structure of their governing (or characteristic) collections, regardless of transpositional level or mode of presentation. These structures may be parsed and labelled in multiple ways, ranging from tonal scales, to modes, to more abstract motivic cells or pitch pools best identified using set class terminology. Differentiation based *solely* on collection type more often characterizes nontriadic and noncentric pitch languages: in the absence of referential pitches or "canonical" collections—the diatonic, octatonic, whole-tone and so on—the internal pitch class makeup of each stratum may become their main source of individuality.

The Cage (1906), a song by Charles Ives, illustrates this idea. At the moment the voice enters, shown in Figure 2.11, the texture divides itself statistically along instrumental and registral lines. The pitches of the vocal line form whole-tone scale segments, while the piano's chords mostly represent stacks of perfect fourths, two outlier sonorities excluded.[110] Here, the notion of a single governing *collection* defers in salience and analytic relevance to the notion of a single characteristic *collection-type*: all boxed chords represent set class [02479]. The emphasis on interval class 5 in this set class creates a sharp syntactic disconnect with the voice's whole-tone segments, which lack *any* representation of interval class 5. In this excerpt, then, voice and piano each assume an independent character thanks to their contrasting preferences of set- and interval class, representing *collection type differentiation*.

[110] These two sonorities—excluded from the boxes in Figure I.1—can be parsed as tertian structures, with a minor triad in the left hand and an incomplete seventh chord in the right.

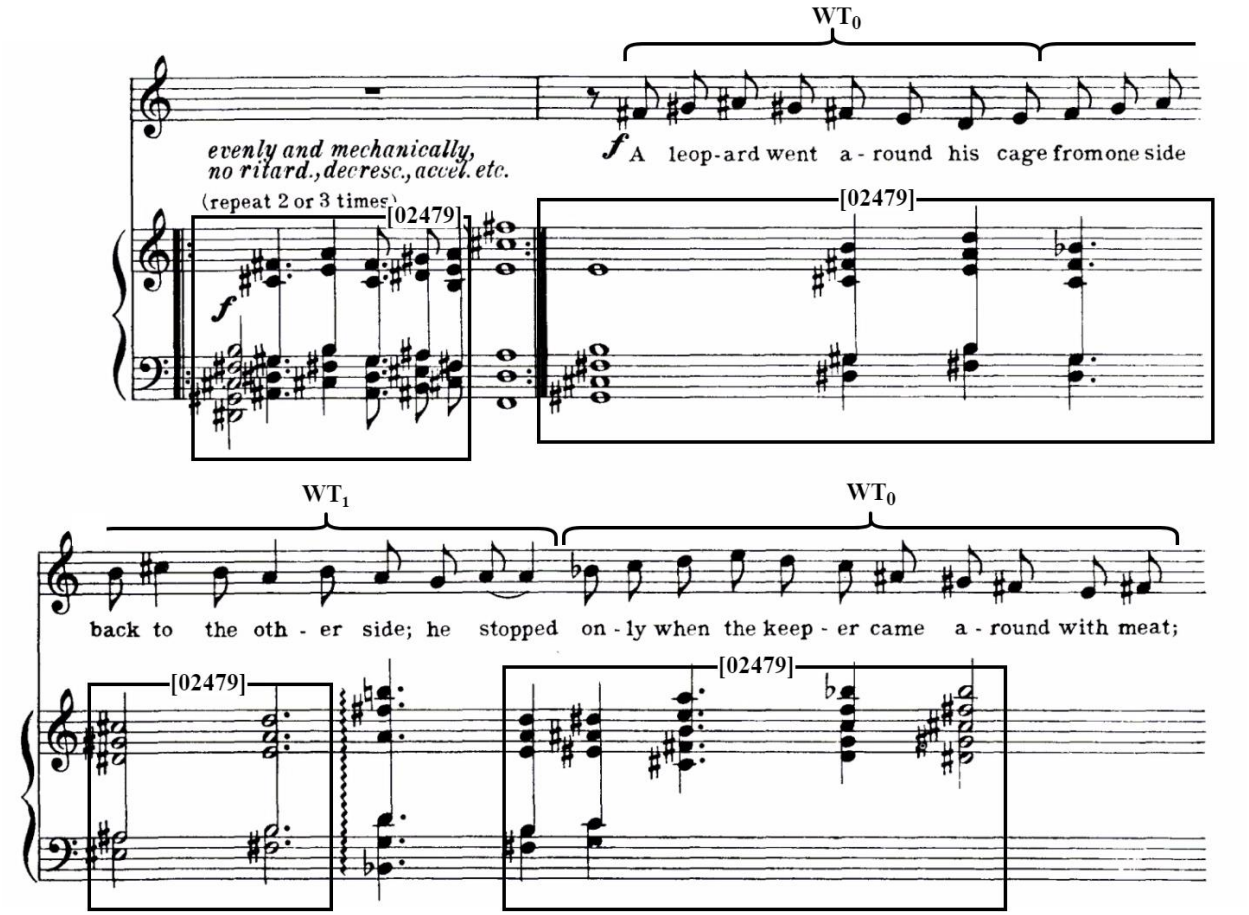


Figure 2.11: *Opening of Ives, The Cage (1906), with characteristic collections labelled. Score in public domain.*

Collection

Strata that share characteristic collection types can enter into syntactically differentiated relationships by existing on different transpositional levels. In a context where a referential pitch can be identified, divergence of transpositional level produces a corresponding conflict of referential pitch, as described below. However, more abstract pitch languages can produce this type of differentiation in isolation.

In the third movement of Ligeti's *Musica Ricercata* (1953), all pitch classes are drawn from a single collection: a triad on C that includes both major and minor thirds (set class [0347]). In the short passage illustrated in Figure 2.12, however, Ligeti cleaves this set symmetrically into two minor thirds, first assigning {0,3} to the right hand and {4,7} to the left and then regularly

swapping the distribution. While the overall expression of a "major-minor triad" collection remains consistent, Its division into two independent transpositions of the [03] set class creates stratification despite registral closeness and rhythmic similarities between the hands. Due to the paucity of pitches available for the piece, no larger scales centred on C are implied; rather, the (0 3) and (4 7) sets represent self-contained harmonic entities operating at different transpositional levels. Thus, this example illustrates *differentiation of collection.* A similar effect could be produced in a diatonic context, by superimposing different modes (all representing the diatonic collection type) sharing same final.

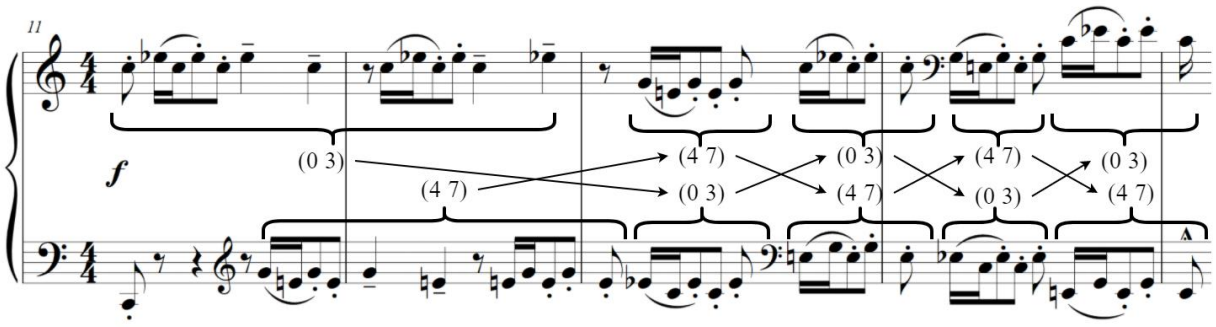


Figure 2.12: *Mm. 14-15 from the third movement of Ligeti, Musica Ricercara (1953). Two transpositions of a minor third create the imppression of stratified contrapuntal texture. Excerpt included under fair use.*

Referential Pitch

Strata differentiated by referential pitch express different tonics, finals, or more abstract pitch centres. They may also differ in whether or not they use a centric pitch language altogether. Most commonly, differentiation of referential pitch combines with differentiation of collection, producing the polytonal textures typical of Milhaud's *Saudades do Brasil*, or of the two Interludes in Ives' *Variations on "America"* (1891). As illustrated in Figure 2.13, Ives' first Interlude divides the texture into two strata, each stating the same tune in its own independent key.[111] In this context, the notion of "key" implies a combination of collection and centre; the differentiation in this example correspondingly engages both of these syntactic parameters simultaneously.

[111] Malhaire briefly discusses this excerpt in *Polytonalité,* 235, highlighting the fact that the right hand belongs in the same key as the preceding variation, while the left hand and pedal signal the key of the one forthcoming.

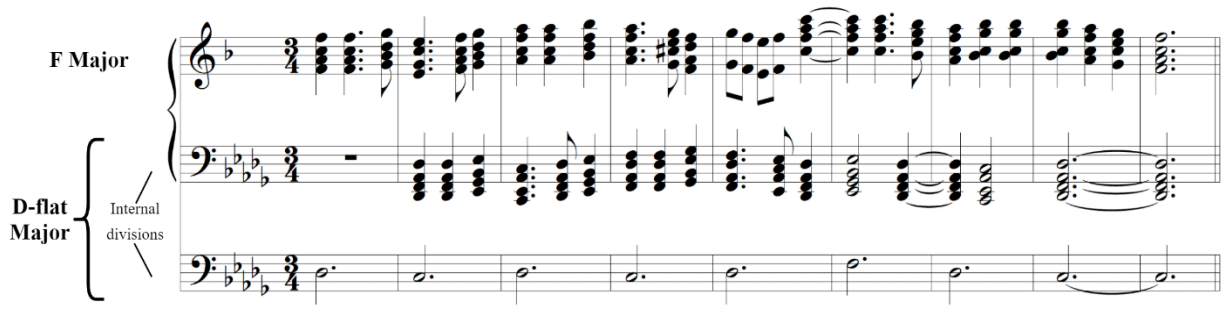


Figure 2.13: *First Interlude from Ives, Variations on "America" (1891). The right hand set the tune in F Major, while the left hand and pedal set the tune in D-flat Major.*

This type of differentiation may also arise out of the superimposition of a stratum that strongly expresses any referential pitch and one with *no* clear centric expression at all. At its most extreme, a simple diatonic melody may be set against a dense chromatic background, as in "The Tides of Manaunaun" from the *Three Irish Legends* (1922) of Henry Cowell (1897-1965). Illustrated in figure 2.14, the piece features strikingly strong stratification that arises out of a quite trivial case of syntactic differentiation: the repeated clusters, though the extremities of each reside within the notated key signature, produce an indistinct, wave-like wash of sound that carries no syntactic meaning *at all*. A more tonally grounded and more clearly pitched situation arises in "Sorocaba" from Milhaud's *Saudades*, as illustrated in Figure 2.15. Citing the orchestral transcription of the dance, scholar Mark Delaere argues that the ascending chromatic scale occupying the middle of the texture represents an independent stratum from the surrounding G-minor material.[112] Deleare describes this stratum as representing its own abstract "key." Despite a misguided use of terminology—"key" implies pitch centricity, which the chromatic line inherently lacks—his analysis correctly identifies *differentiation of referential pitch* as being responsible for the disconnect between the two strata.

[112] See: Mark Delaere, "'Autant de Compositeurs, Autant de Polytonalités Différentes': Polytonality in French Music Theory and Composition of the 1920s," in *Tonality 1900-1950: Concept and Practice*, ed. Felix Wörner, Ullrich Scheideler, and Philip Rupprecht, Franz Steiner Verlag (Stuttgart: Franz Steiner Verlag, 2012), 157–72. Delaere's analysis occupies 166-67; Figure I.5 represents a reduction of the orchestral passage cited on 167.

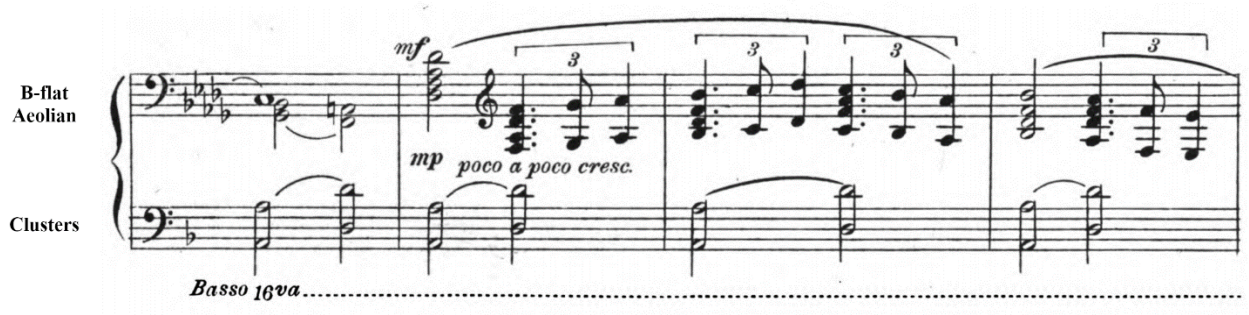


Figure 2.14: *Excerpt from Cowell, "The Tides of Manaunaun" from Three Irish Legends (1923). The clusters feature no referential pitch or identifiable collection, while the top line is diatonic and centred on D-flat. Excerpt reproduced under fair use.*

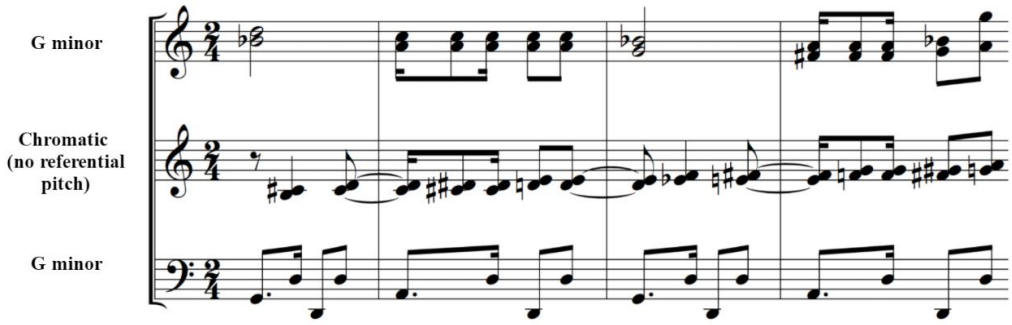


Figure 2.15: *Excerpt (reduced) from the orchestral version of Milhaud's "Sorocaba" from the Saudades do Brasil (1920). The central strata offers no referential pitch, differentiating it from the G-centred outer strata. Excerpt included under fair use.*

In more ambiguous modal contexts, strata differentiatied through referential pitch may also imply different foci *within* a single scale or mode. In "Bredon Hill," the fifth song from Ralph Vaughan Williams' *On Wenlock Edge* (1909), the strings and piano end the introductory section on a superimposition of minor seventh chords built on A and E. At this particular moment, illustrated in Figure 2.16, the placement of the A minor-seventh chord in the bass weakly suggests hearing the chord in the top register as an extension of the lower A-minor harmony; however, registral divisions provide some amount of ambiguity. Nevertheless, the total collection expressed by the accompaniment corresponds to a diatonic scale—in this case, a mode on A (perhaps comprising a secondary focus on E), with the inflection of F left ambiguous.[113] The voice, however, enters with a line quite resolutely centered on G, extracting pitches of a pentatonic scale from the diatonic background. Though all pitch classes of the texture assimilate into one diatonic collection, clashes

[113] F is the only pitch missing in the initial chord of m. 24. Earlier in the introduction, both F-natural and F-sharp are used; however, in the measures preceding figure I.6, a bell-like figure in the piano in parallel fourths uses F-sharp exclusively.

between competing foci occur, particularly between the voice and ensemble.[114] While later measures feature harmonic convergence between the two strata, the effect of the incisive vocal entry remains quite striking.

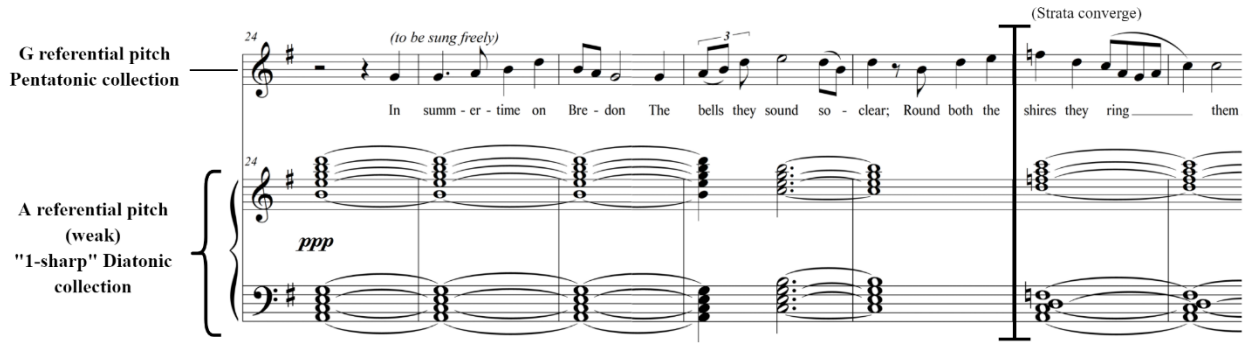


Figure 2.16: *The voice entry in Vaughan Williams' "Bredon Hill" from On Wenlock Edge (1909). While all parts share a diatonic collection, they express divergent foci within.*

Harmonic Function/Location

When strata share a combination of referential pitch and collection, they may nonetheless be differentiated by moment-to-moment divergences in the harmonies being expressed. In a tonal context, this type of differentiation occurs when strata display asynchrony of harmonic change, or each features its own distinct succession of harmonic functions. In the common-practice literature, pedal points represent an embryonic example of this type of differentiation.[115] In Figure 2.17, the final bars of a fugue by J.S. Bach,[116] the bass voice remains stationary on D following the final arrival on the tonic, while the upper voices continue to move for another four bars. While, in this particular musical language, the harmonic primacy accorded to the bass voice reduces these final bars to a decorated tonic prolongation, the local harmonic mobility of the upper voices creates a palpable *textural* contrast. The immobility of the bass effectively creates opportunities for the upper voices to express diverging harmonic functions on the musical surface.

[114] The reduced pitch-class content of the pentatonic scale contributes to an additional sense of "sharpness" of the voice against the less distinct diatonic wash of the accompaniment.

[115] The choice of a work by Bach to illustrate a type of layered musical construction has precedent in Milhaud's turn to counterpoint as an attempt to historically justify polytonal practice; see the mention of "Polytonalité et Atonalité" in Chapter 1, footnote 4.

[116] *Contrapunctus III* from *The Art of Fugue*, BWV 1080.

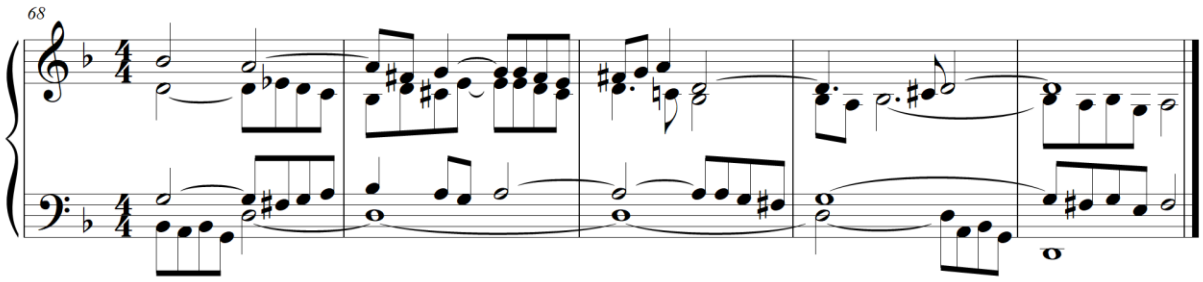


Figure 2.17*: Final Bars of Contrapunctus III from Bach, The Art of Fugue. The pedal point represents an embryonic version of differentiation of harmonic function.*

In nontonal contexts, differentiation on the basis of harmonic *location* may still occur, if the strata involved feature different subsets of a larger collection, or if they express strongly divergent configurations or patterns in register despite sharing an overarching collection. Effectively, *location* here refers to spatial configurations and/or choices of notes from a larger (shared with other strata) pool of pitch classes.[117] In the opening of the second of the *Sea Interludes* from Benjamin Britten's *Peter Grimes,* op. 33a (1945), illustrated in Figure 2.18, the horns and high woodwinds each represent a textural stratum. While the pitches of both strata fit within a lydian pentachord, they are organized quite differently in each instrument family. While the horns stack the notes of the pentachord tightly into a diatonic cluster, the high woodwinds divide them between two fifths, with the G-sharp functioning as a neighbour note. Later, in mm. 13-15, the woodwinds introduce additional pitches to the overall collection, adding a major sixth and minor seventh to the initial lydian pentachord; however, these are still organized in such a way to preserve the openness and wide intervallic profile characterizing the opening and closing segments. The contrast between scalar configurations in the horn stratum and open, widely spaced configurations in the woodwind stratum effectively engages *differentiation of harmonic location*. In a more contemporary context, David Temperly identifies differentiation of harmonic location as a common trope of rock music, with the melody and chordal accompaniment sharing (generally diatonic) an overarching collection but diverging in location; in verses, the chordal accompaniment tends to be highly mobile while the voice independently expresses a fixed set of pitches (often a pentatonic scale).[118]

[117] Effectively: "Where are we in this collection/scale"? Divergences in tonal function necessarily involve divergences in location, with one stratum emphasizing the pitch classes of one harmony and other strata emphasizing others.

[118] David Temperly, "The Melodic-Harmonic 'Divorce' in Rock," *Popular Music* 26/2 (2007): 323-342.

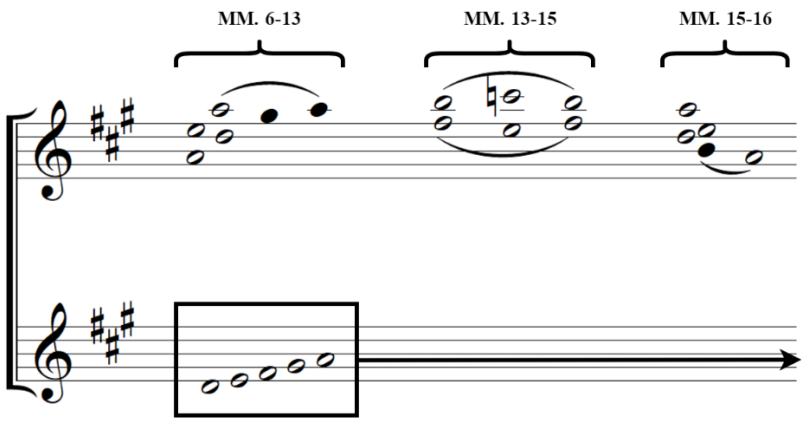


Figure 2.18 : *A reduction of the pitches stated in the opening of the second Interlude from Britten's Peter Grimes, op. 33a (1945). A tightly-packed cluster in the bottom parts distinguishes itself from the prominent use of interval class 5 in the upper parts.*

Functional Expression

In musical languages that make use of, or reference, common-practice tonal techniques, strata may be differentiated according to the degree to which they express themselves functionally. Operating more abstractly than do divergences in collection or referential pitch, this type of differentiation generates stratification by pitting tonal functions against contrasting methods of pitch organization. In the "Lullaby" from *From Jewish Folk Poetry* of Dmitri Shostakovich, Op. 79 (1948), excerpted in Figure 2.19, the voice and piano represent separate strata differentiated in this way. The opening melody, first stated in the piano and then taken up in the voice, outlines a Phrygian pentachord with a raised fourth centred on C as shown in Figure 2.20a. Meanwhile, as Figure 2.20b illustrates, the accompaniment occupies a more chromatic space nevertheless assimilable to C minor; the bass pattern effectively references the alternation of tonic and dominant scale degrees, while the off-beat chords reinforce the centricity of the "tonic" C minor triad through chromatic neighbouring motion around its third and fifth. Not entirely common-practice, the accompaniment nevertheless carves out a vaguely tonal, chromatic space, while the melody forms a decidedly *modal* stratum that does not carry any salient tonic/dominant implications. As was also the case in the "Bredon Hill" excerpt discussed earlier, the piece later moves towards more complex harmonic relationships that feature moments of syntactic alignment between voice and accompaniment. The immediate opening of the "Lullaby" sets up a structural opposition between modality and tonality that engages the notion of *differentiation of functional expression*.

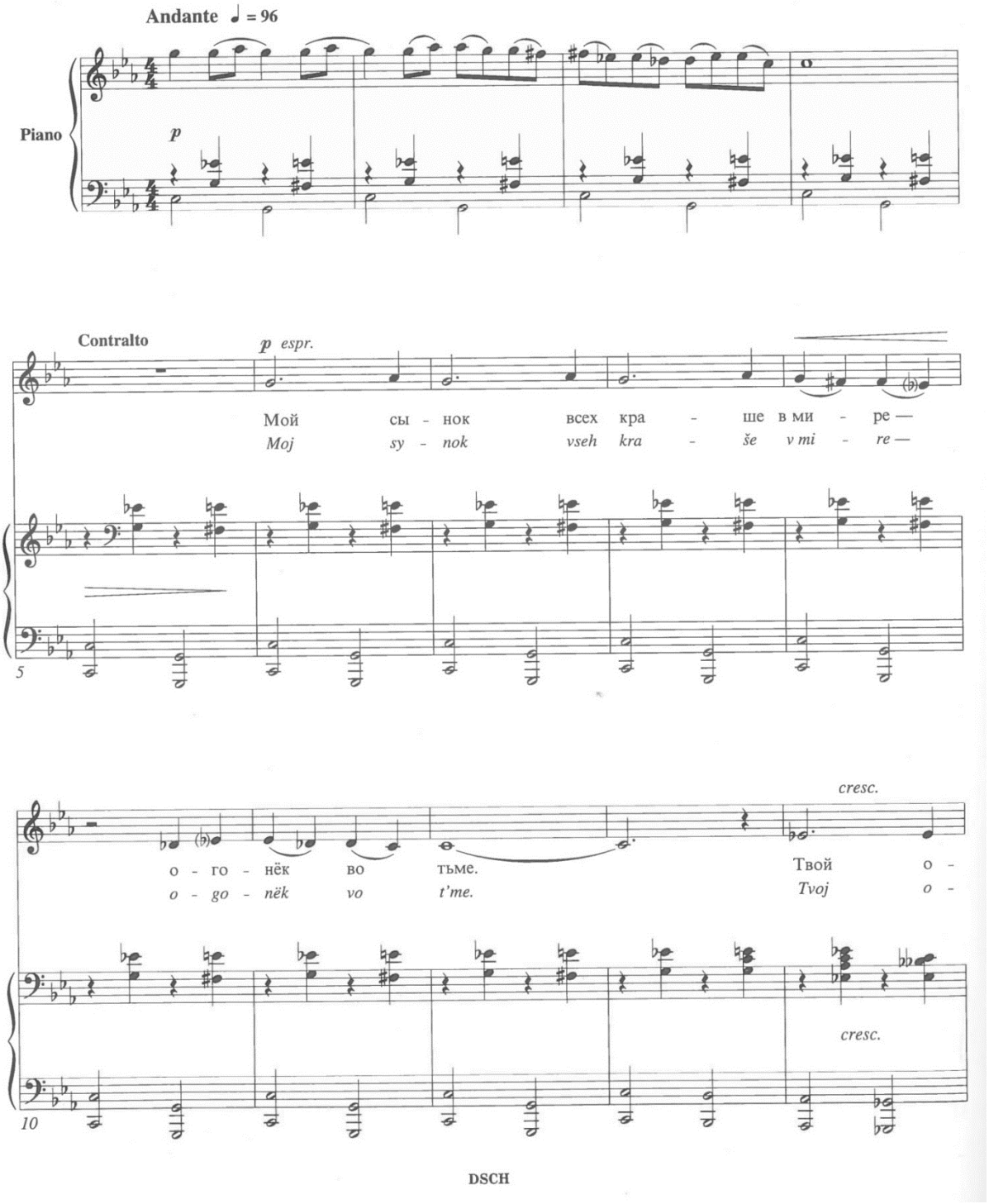


Figure 2.19 : *Shostakovich: "Lullaby" of From Jewish Folk Poetry, op. 79 (1948), opening. The piano part's allusions to tonality create a disconnect with the modality of the voice part. Reproduced from DSCH (collected works edition) under fair use.*

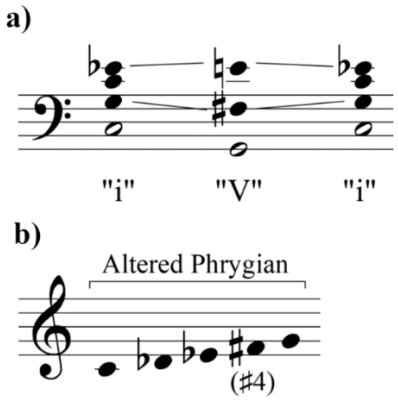


Figure 2.20 : *An illustration of the piano's tonal reference; the distinctly non-tonal pentachord outlined by the voice.*

Chapter 3 : Analytic Demonstrations

Having set out the differentiation model in the previous chapter, in this chapter I provide three brief analyses of excerpts by Ireland, Britten and Vaughan Williams. All three excerpts make use of tertian harmonies and make use of diatonic scales and referential pitches. As they feature stratified textures, they represent opportunities to use the language of the differentiation model; here, I concentrate on broad overviews of form and the way in which stratification contributes to shaping rhetorical flow within it.

Vaughan Williams, *Third Symphony* (1922), First Movement

The music of Vaughan Williams proves fruitful for analysis of stratified textures more complex and nuanced than those of Milhaud's "canonic" polytonal works. Characteristic of his output is a looser expression of referential pitch achieved through diatonic, but not necessarily functional, harmonic means.[119]

Figure 3.1 provides a reduction of the opening 16 measures of the first movement. The notation itself already suggests a tripartite formal segmentation, with a change of tempo and a new expressive marking (*Molto tranquillo)* singling out mm. 9-12 as gesturally distinct. The excerpt's melodic content further reinforces this division, with the thematic material of the low strings in mm. 4-7 returning in mm. 12-16, this time in imitative fashion. Mm. 9-12, in contrast, feature new melodic material assigned to solo instruments along with new rhythmic content (the eight-note triplet figure that first appears in the solo violin entry at m. 9). A closer look at how the syntactic differentiation operates in this passage not only supports the formal segmentation implied by the

[119] Vaughan Williams's harmonic language has recently begun undergoing more thorough investigation by theorists. Expanding beyond identification of diatonic modes governing isolated melodic segments, research has explored both the large-scale deployment of diatonic materials and has developed more nuanced models of local expression of referential pitch that integrate tonal references and ambiguities of mode. See Ian Bates, "Vaughan Williams's Five Variants of 'Dives and Lazarus': A Study of the Composer's Approach to Diatonic Organization," *Music Theory Spectrum* 34, no. 1 (Spring 2012): 34–50, and David Manning, "Harmony, Tonality and Structure in Vaughan Williams's Music" (Ph.D. Diss., Cardiff University, 2003). My analysis, of more limited scope, stays within the bounds of traditional modal and scalar identification; however, Manning's discussions of "Undermining modalised tonality" and "juxtaposition as a tonal strategy" (124-132) identify pertinent examples of stratified textures from elsewhere in the composer's output.

expressive markings and melodic content, but also reveals subtle references to the typical formal trajectory of classical-period sonata form beginnings.

From the outset, the use of parallel triads in the excerpt makes identifying collections and referential pitches difficult. In mm. 1-3, for example, statistical similarities (most saliently, well-blended timbres) along with identical rhythms and contours prompt grouping of the woodwind's eight-note parallel-triads figure into a single stratum. However, these same unifying factors make the expression of an overall referential pitch more ambiguous. On the one hand, the top note of the pattern, as the potential "tune"[120] of the opening three measures, suggests a focus on D. On the other hand, G assumes equal prominence as the root of the most salient triad of the figure (harmonizing the top voice D, and occurring only in strong metrical positions). In this interpretation, D functions as a melodically salient but harmonically subordinate upper fifth to the referential pitch. This subtle ambiguity persists until the entrance of the thematic material in m. 4, which confirms the G-centric interpretation.[121] Similar subtle complexities arise when determining collection. While the bulk of mm. 1-8 expresses the white-note diatonic collection, Vaughan Williams uses a B-flat major triad to harmonize F in the top voice of the woodwind pattern as well as in the lower strings' melody (see mm. 4, 6 and 8). This B-flat can be conceived of as a local alteration, necessary to avoid writing a diminished triad.[122] In this interpretation, the B-flat, though requiring some extra consideration, remains subordinate to the underlying white-note diatonic framework.

[120] In much the same manner as the top voice, by virtue of its position, represents the "tune" of a four-part chorale setting.

[121] In this case, both the woodwind and low strings strata express the same collection and referential pitch, and thus form a modally unified whole. I discuss this relationship further below. Existing surveys also identify G Mixolydian as the governing mode here: see Lionel Pike, *Vaughan Williams and the Symphony* (London: Toccata Press, 2003), 77 as well as Elliott S. Schwartz, *The Symphonies of Ralph Vaughan Williams* (New York: Da Capo Press, 1964), 59.

[122] Pike interprets the B-flat similarly, and later states: "The parallel triads at the opening of the Pastoral Symphony allude to pre-polyphony and medieval organum—a landscape lost in the mists of time." The aesthetic connection between the use of B-flat in order to avoid tritones and medieval practice here seems musically satisfying. See Pike, *Vaughan Williams and the Symphony*, 80.

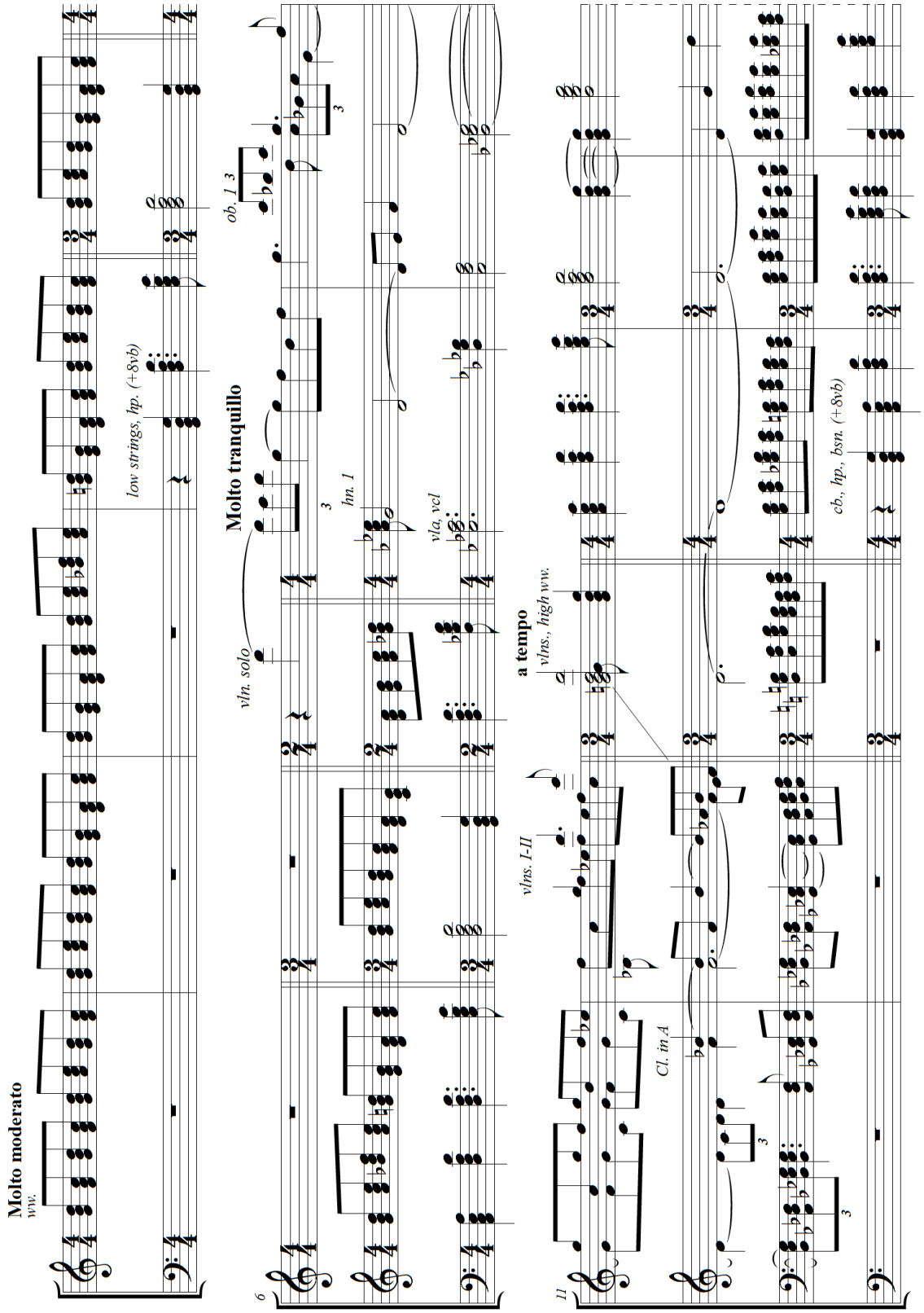


Figure 3.1: *Reduction of the opening of Vaughan Williams, Third Symphony (1922), First Movement.*

A strong overarching framework cannot be similarly identified in the viola and cello parts in mm. 9-12. Their line, though featuring similar parallelism to the woodwind pattern in mm. 1-8, now employs only major triads, eliminating the possibility of a governing diatonic collection (which would have produced minor and diminished triads). Gathering all pitch classes written in the passage, as shown in Figure 3.2a, produces unsatisfactory results; one obtains a quite uncharacteristic ten-note collection (Forte set class 10-2). More pertinent to the line's construction would be to single out the Lydian tetrachord traced by each of the three chord factors, as in Figure 3.2b; however, overall sense of collection remains ambiguous. The parallel triads effectively dilute the characteristic sound of the Lydian hexachord by neutralizing the overall collection of mm. 9-12. Similarly, the notion of referential pitch seems to lose its meaning here, as the line is internally divided into three identical structures, each potentially expressing the "correct" collection and referential pitch. Additionally, its accompanimental role, registral position, and use of second-inversion triads preclude the top voice or chord root from becoming the most salient voice. Paradoxically, then, what seems so striking about the viola and cello gesture is precisely its ambiguity and lack of solid reference points: it occupies a stratum whose pitch organization displays a high degree of fuzziness, and against which a sharply focused line would differentiate itself quite strongly.[123]

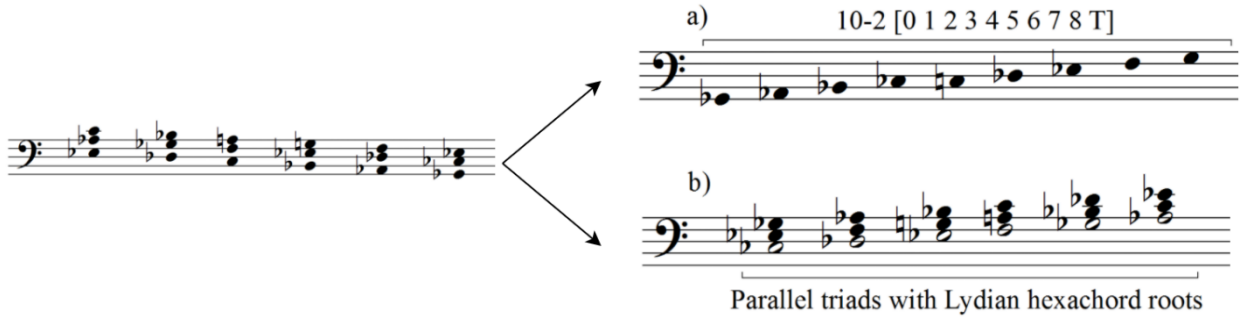


Figure 3.2: *Parsings of the Cello and Viola line in mm. 9-12.*

[123] See Figure 2.15. Pike picks up on the stratification at play here: "[…] the accompaniment shifts into flat keys; undeterred, the solo violin continues in Mixolydian, producing a feeling of bitonality." See Pike, *Vaughan Williams and the Symphony*, 82. Though his description does imply a contrast between fuzziness and sharpness (a vague "flat keys" versus a more precise "Mixolydian"), Pike's theoretical language is lacking: the parallel triads in the lower strings have little to do with the diatonicism and circle-of-fifths collectional basis inherent to the notion of "key," whereas their lack of referential pitch precludes participation in the conflicts of centricity implied by most definitions of polytonality encountered in Chapter 1.

Zooming out to integrate the above observations into a larger picture, Figure 3.3 graphically represents the evolution of all textural strata over mm. 1-16. Each horizontal line represents a distinct stratum that may feature multiple instruments or gestures; for greater clarity, the instruments involved are notated as they are on the reduction in Figure 3.1. Solid lines represent a single stratum operating over a given period of time, while dotted lines represent members of one stratum joining another. For each stratum, brief comments about their characteristics are provided; comments on how differentiation operates throughout an entire section appear at the bottom of the figure.

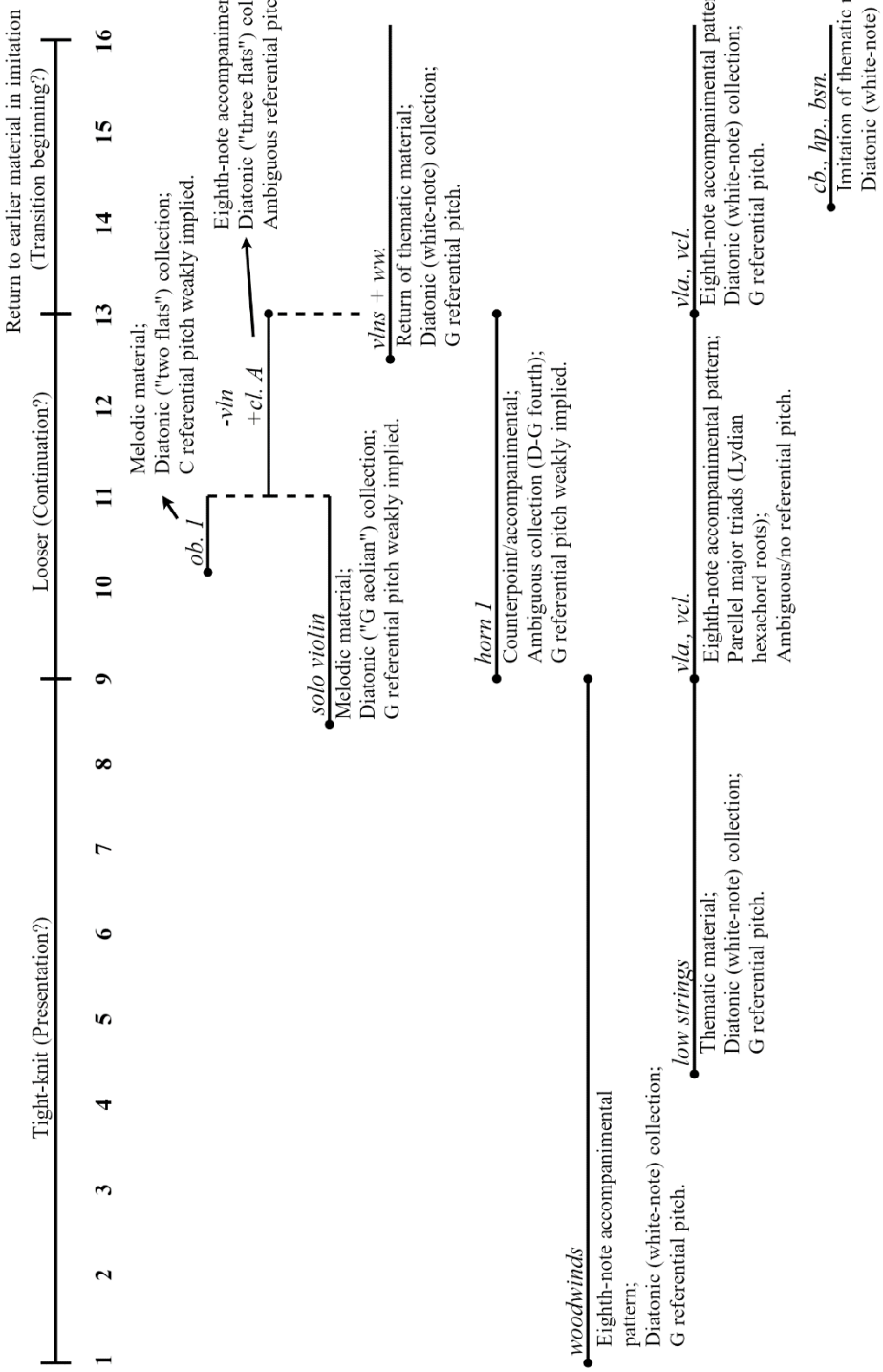


Figure 3.3: *A graphical representation of the strata involved in Fig. 1.1.*

Respecting the formal segmentation suggested earlier, Figure 3.3 is divided itself into three parts; respectively, mm. 1-8, 9-12 and 13-16. This division is visually apparent, as new strata appear in mm. 9 and end on the downbeat of m. 13. Subtler, however, is the way in which the middle section introduces new differentiating factors to those used in the outer sections. All strata in mm. 1-8 and 13-16 express both a G referential pitch and a white-note diatonic collection (G mixolydian). Additionally, the parallel triads of each stratum at any given moment generally do not line up with one another, resulting in momentary differentiation on the basis of harmonic location (tonal harmonic functions being inapplicable in this modal context).[124] Effectively, syntactic differentiation in the realm of pitch organization operates quite weakly in these sections.

In contrast, the middle section features both differentiation on the basis of collection type and referential pitch. Collection type proves the most salient factor here: while the viola and cello parts form an ambiguous stratum based on parallel major triads sourced from a Lydian hexachord, as described above, the solo instruments (in Figure 3.1, those notated on the top two staves) all source their material from two diatonic collections. These solo parts, however, feature internal divisions: the horn part, occupying a distinct registral band between the lower, more accompanimental parts and the higher-pitched violin, oboe and clarinet entries, forms a separate stratum acting first as a counterpoint to the violin and oboe figures (mm. 9-10), and then responding to the triplet figure in the lower parts (m. 11). It thus establishes a certain degree of textural independence, while still smoothing out the entire texture by providing a timbral and registral link between the low strings and high woodwinds.

The interplay between the violin solo beginning in m. 8 and the imitative oboe entry in m.10 generates further complexity. While the latter instrument strongly implies a G referential pitch, the former briefly seems to imply a C centre. While they combine forces to produce an eighth-note pattern in m. 11 emphasizing G once again, the introduction of E-flat on the last note of the measure and the corresponding shift in diatonic collection (as indicated in Figure 3.3) switches the focus once again, to a quite weak emphasis in the oboe line on F.[125] Meanwhile, the horn counterpoint stratum has maintained its initial collection, as evidenced by the E-natural on the last eighth note

[124] The downbeat of m. 13 is particularly salient as a point of chordal concordance between all strata, reinforcing the return of G mixolydian and the opening thematic material.

[125] At this point, the clarinet in A part has taken over for the violin. In this case, there is no addition or change of stratum whatsoever; one instrument has replaced another in a single multi-instrument stratum.

of m. 12; additionally, its outlining of a G-D fourth in m. 9 and the agogic emphasis of D in its part weakly imply either G or D as potential referential pitches. There then exists a high degree of ambiguity in assigning referential pitches to the upper strata of the texture in mm. 9-12—a process that had been quite straightforward in the outer sections.

In the middle section, then, three processes play out: introduction of differentiation on the basis of collection type, complexification of the interaction between strata and introduction of greater ambiguity of referential pitches between strata. These observations justify our initial formal segmentation: not only does the middle section introduce new melodic and rhythmic material, but it also features a sharp rise in intensity and complexity of syntactic differentiation. Furthermore, the excerpt traces an overall trajectory of intensification and recession of differentiation that implies a conceptual connection to the normative behaviour of classical-period sonata form openings; more specifically, those featuring a transition beginning with main-theme material. William Caplin, in his treatment of classical form, distinguishes between formal units that display a relatively *tight-knit* organization and those that are *looser*.[126] Associating increasing intensity of syntactic differentiation with looser organization creates a rough mapping of the structure of the excerpt onto the following sequence:

- Tight-knit presentational material (mm. 1-8, containing main theme material);
- Looser continuational material (mm. 9-12);
- Transition beginning that features a return of main theme material, but "loosens up" the organization of the main theme by presenting it in imitation (mm. 13-16, here this process is adhered to quite literally).

This movement's overall kinship with sonata form makes searching out these subtler connections to common-practice formal designs particularly rewarding.[127] More broadly, however, these observations demonstrate the success of employing the differentiation model in illuminating formal structure; furthermore, they show that existing "*poly*-isms" from the literature are not

[126] These concepts make use of the theory outline in William E. Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart and Beethoven* (New York: Oxford University Press, 1998). While traditional formal functions do not apply so neatly here, the basic characteristics that determine the relative "tightness" of a given unit—regularity of grouping, strong and simple goal-directedness, familiarity of construction—remain easily grasped from the musical surface.

[127] See Schwartz, *The Symphonies of Ralph Vaughan Williams*, 58 and Pike, *Vaughan Williams and the Symphony*, 79-80.

strictly required in order to arrive at a precise description of the relationships between musical layers in the excerpt.

John Ireland, *For Remembrance* (1921)

For Remembrance, the second of a set of two piano pieces by John Ireland (1879-1962), combines superimposition with elements of tonal language. Intensity of stratification varies across the A/A' and B sections of a ternary form in such a way that traditional common-practice formal expectations are fulfilled despite ambiguities in tonal function and pitch centre.

A broad formal overview, as Figure 3.4 illustrates, shows a typical tripartite form, with an expanded recapitulation. The double bar at m. 18 signals the arrival a new section; as I argue below, changes in stratification and expression of harmonic function support this dividing point. The section beginning in m. 38 intuitively corresponds to a recapitulation of the opening material; however, mm. 54-59 represent an interpolation of additional material having no analogue in the opening section. Rather, their rhythmic profile and contour suggest material from the opening of the B section—mm. 19-22.

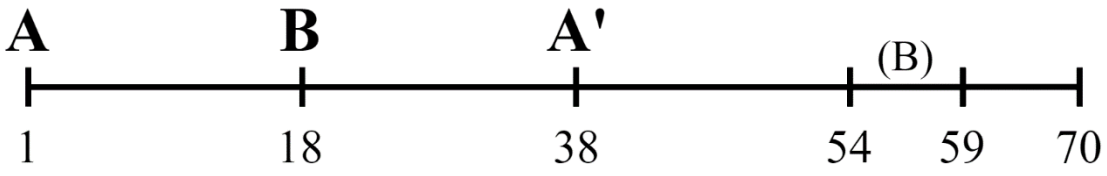


Figure 3.4 : *Formal plan of Ireland, For Remembrance (1921).*

The texture of the work remains fairly consistent throughout, with a linear component being superimposed onto a homorhythmic, chordal layer. The linear component does not assume the character of a melody, containing little in the way of characteristic contours, rhythmic variety, or distinct intervallic successions. Rather, it assumes a mostly scalar character, strongly chromatic at certain moments (mm. 1-2, for example) and almost diatonic at others (mm. 19-20). Registrally mobile, it spans from C^2 (m. 56, reaching down to F^1 as an octave doubling in m. 58) to B-flat^6 (reached in m. 33). Nevertheless, it always lies either *within* or *below* the chordal component of

the texture, allowing for primary focus on syntactic divergence (as opposed to statistical differentiation of register).

This configuration displays a strong potential for stratification. Excluding pitch, syntactic differentiation already operates through rhythmic contrasts, the linear component preferring eighth notes and the chordal component preferring quarters and halves. Statistical differentiation operates mainly through orchestration, with the line vs. chord distinction front and centre. Though less palpable, differentiation through register operates at moments where the linear component represents the sole voice in the bass register; these include mm. 19-22, 28-30 and 56-59. The differentiating factors *extrinsic* to this configuration, then, concern collection, referential pitch and harmonic function—the parameters that determine the degree of closeness between linear and chordal components in terms of pitch organization.

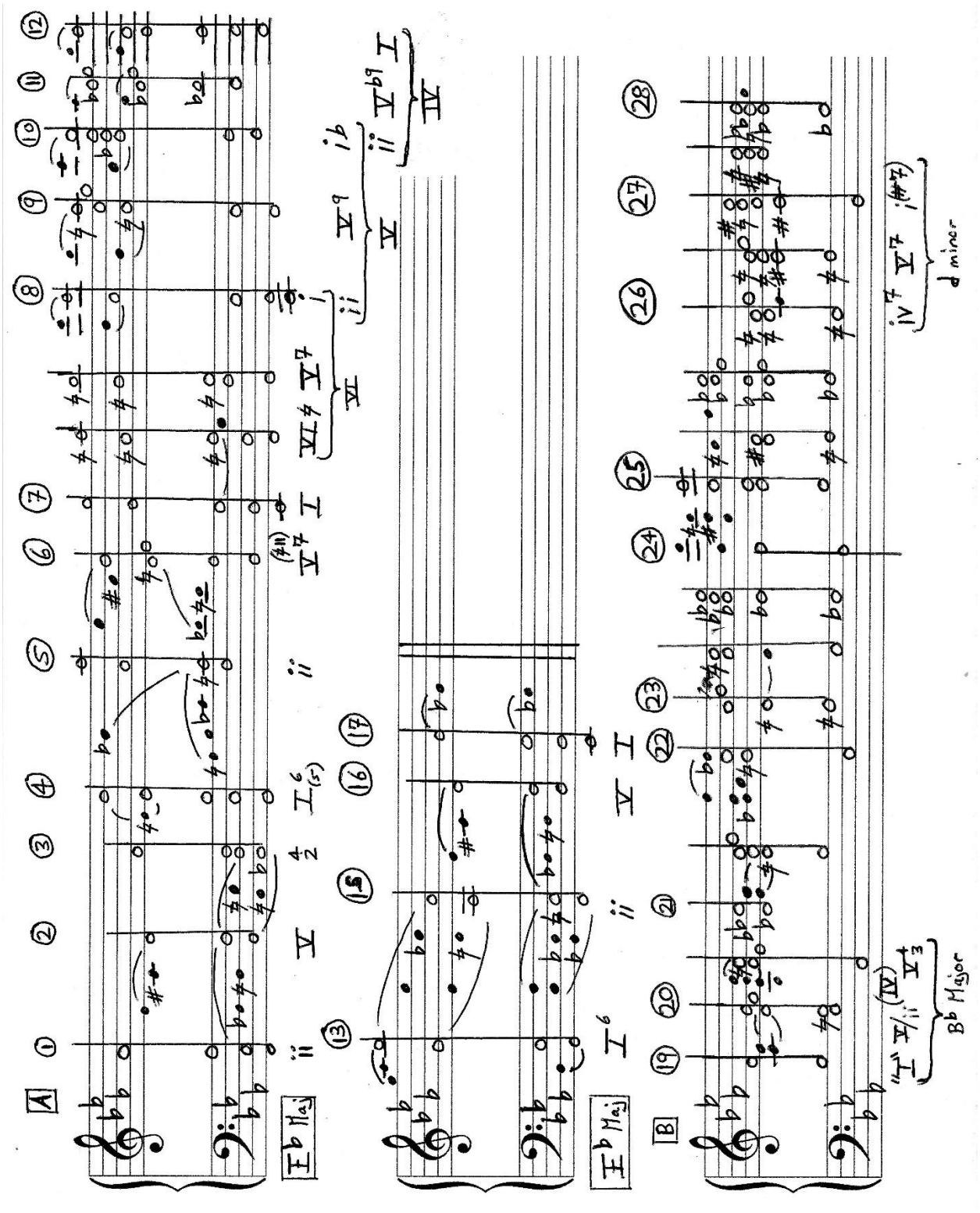
The work's pitch organization resists straightforward common-practice categorization; rather, it displays a high amount of ambiguity and tonal freedom. The degree of ambiguity between sections, however, varies. In the A section, tonal function is more easily detectable, while in the B section, it largely disintegrates over larger stretches of music. This contrast of functional expression affects the perceived importance of the linear component, while fulfilling traditional expectations of middle sections as being contrasting and allowing for greater tonal movement.

Figure 3.5 illustrates the contrasts of functional expression from section to section by providing a reduction of the chordal component alone, parsing the chordal stratum of the A and B sections into triadic harmonies. Stemmed white notes represent these harmonies, with black noteheads representing nonharmonic tones that surround it, located in conceptual inner voices. Note that the stemmed harmonies do not all occur in a single attack; often a chord tone is delayed or anticipated, or only present after a nonchord tone has sounded. Figure 3.5 is thus a graphic representation of a possible triadic background structure that may be expressed in a temporally looser way on the surface. Measure numbers containing the notes of each harmony are indicated above.

The harmonic structure of Section A plays out quite straightforwardly, though inner-voice chromaticism obscures otherwise stock progressions. Mm. 1-7 and 13-17 are solidly anchored in E-flat major, while mm. 8-12 successively tonicize vi, V and IV. These harmonic excursions connect the I of measure 7 to the I^6 of measure 13, with the tonicized scale degrees forming a descending stepwise pattern as shown in the staff below the corresponding measures. Abstractly,

the harmonies of section A group into a traditional tripartite structure, with the first (mm. 1-7) and third (13-17) phrases ending on the tonic and the second, middle phrase (mm. 8-12) turning towards new scale degrees.

In Section B, tight tonal relationships break down. A handful of salient dominant-type sonorities resolving a fifth down as expected suggest momentary tonics or might foreshadow sequences of fifths; however, these functional moments remain short and scarce. Many harmonies here must be parsed as including unresolved suspensions or sevenths and ninths not functioning as expected. Effectively, the shift in the chordal component from more tonally stable material in the outer sections to much less grounded material in the centre functions analogously to that from tonic-anchored material to exploration of different tonal regions in classical ternary forms.


A
B
E♭ Maj
B♭ Major
B♭ minor

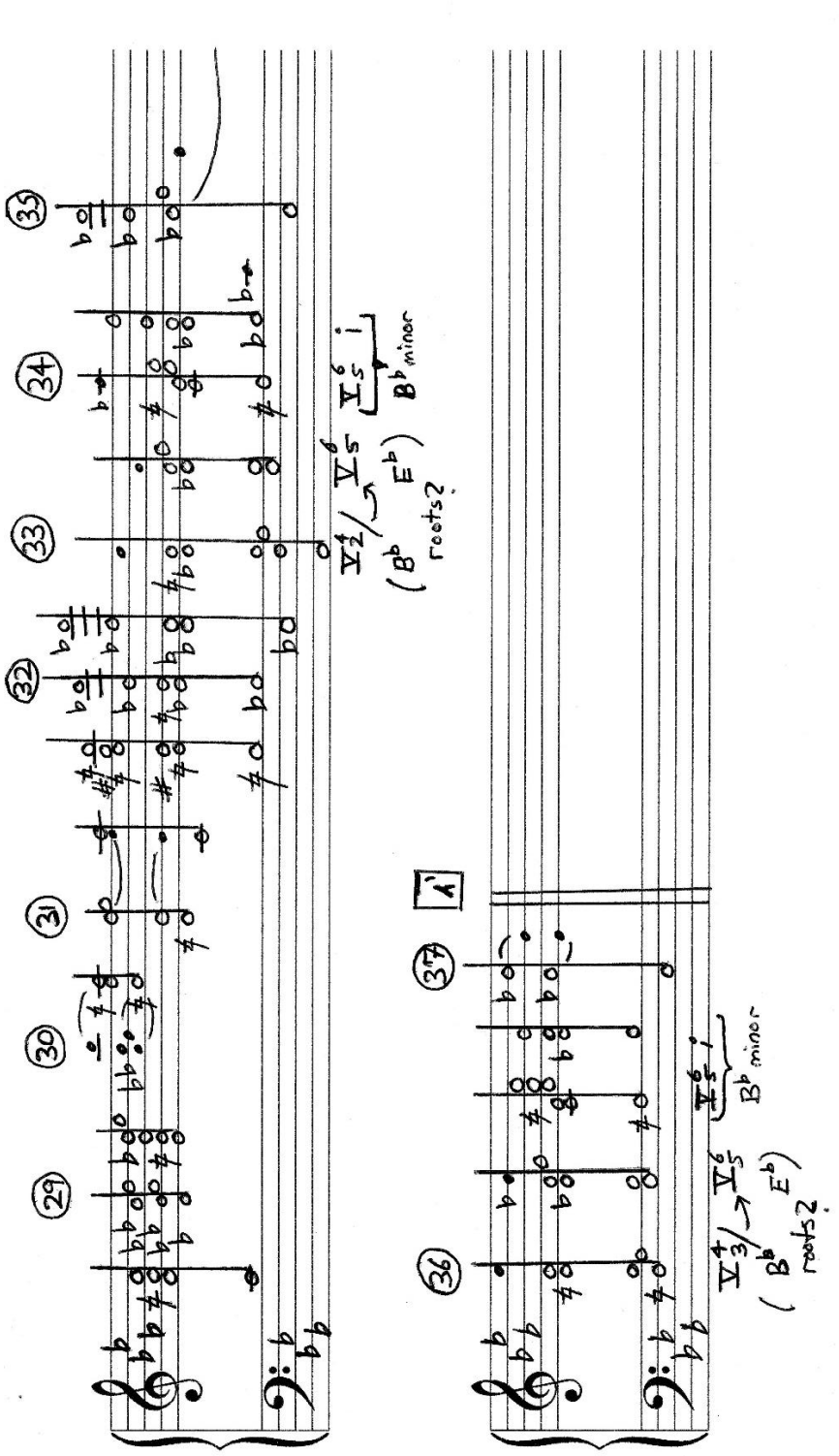


Figure 3.5: *Reduction of the chordal component in sections A and B, with tentative harmonic analysis.*

The linear component, as an overlay on top of the chordal structure of Figure 3.5, does not assume equal rhetorical positions in sections A and B. In much the same way as strata that express a strong referential pitch stand out against strata that do not,[128] the chromatic, non-referential linear component sets itself off most strongly against the more strongly obviously background of section A. The harmonic vagrancy of section B, meanwhile, does not allow for such stark contrasts, offering up no tonal centricity to oppose the free flow of its linear overlay. Consequently, the shift from sharpness to fuzziness in the functional expression of the chordal stratum affects the intensity of stratification from section to section accordingly.

Ultimately, though a stratified texture is used continuously throughout *For Remembrance*, its intensity and the syntactic strength of the differentiation producing it changes from section to section. The differentiation model and its terminology allow these changes to be described and to be related to structural harmonic concerns without recourse to problematic *poly-* labels. As will also be the case in the two following analyses, this model effectively allows for clear, sharp insights into musical languages that employ superimpositions of already harmonically fuzzy objects.

Britten, Serenade for Tenor, Horn and Strings (1943), "Dirge"

Stratification forms the basic compositional premise of the "Dirge" from Benjamin Britten's *Serenade for Tenor, Horn and Strings,* Op. 31 (1943). Throughout the work, the voice intones an unwavering 6-bar ostinato opposite continuously changing material in the ensemble. The succession of pitch combinations and harmonic implications arising from this compositional setup generates a formal design defined by the continuous process of gestural intensification and recession operating in the ensemble over the course of the piece. On a more superficial level, controlled amounts of syntactic differentiation within the ensemble itself enhance the *Dirge's* overall rhetorical flow.

The persistence of the voice ostinato, which is strictly respected throughout, accordingly demands a continuous (as opposed to sectional) rhetorical structure. Furthermore, with no large-scale organization inherent in the voice's melodic material, the instrumental ensemble is tasked with

[128] Recalling here the discussion of Figure 2.15.

generating a coherent and comprehensible teleology. It achieves this by projecting a curve of intensification and recession: the ensemble effectively begins and ends the movement in silence (voice alone), while it reaches a peak of dynamic level and textural density (with the entry of the horn) at m. 31. A series of successive imitative entries eventually encompassing the entire ensemble leads up to this peak, while a corresponding decrease in dynamic level then accompanies recollections of previous motivic and rhythmic events leading back to silence. [129]

Differentiation of referential pitch, but with no accompanying change of overarching collection, characterizes the series of imitative instrumental entries that occurs in the first half of the movement. Hearkening back to the principle of subject and answer in fugal expositions, each instrument enters with the same melodic "head"; Figure 3.6 gives its first appearance.[130] In this modernized version of the idea, however, entries occur not on tonic and dominant scale degrees, but on a wider variety of pitches; furthermore, each line maintains its referential pitch independently of what may be occurring in other voices despite sourcing its material from one overarching diatonic collection.[131] Figure 3.7 lists the referential pitch of each successive instrumental entry, up to m. 31. Though the relative independence of each line produces stratification, its intensity remains low due to the overarching use of a single diatonic set for all lines, allowing the instrumental voices to coalesce into one group set off from the voice both timbrally and syntactically. The internal stratification of the ensemble thus operates at a lower (though still musically meaningful) level than does the "external" division between voice and instruments. I shall discuss the formal role of differentiation between internal strata of the ensemble further below.

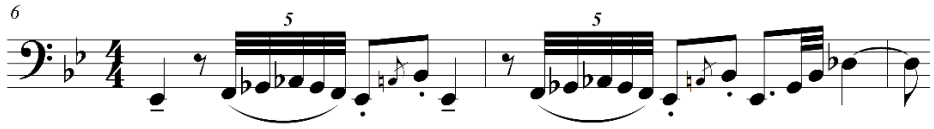


Figure 3.6: *Imitated Melodic 'Head'.*

[129] This continuous organization resembles structures such as the large crescendo – diminuendo pattern in Ravel's orchestration of "Bydło" from Mussorgky's Pictures at an Exhibition.

[130] Michael Kennedy describes the exchanges of this figure as "a fugue which sounds as if harrowed by hell"—connecting the syntactic recontextualization of imitation in Britten's idiomatic pitch language with the content of the text. See Michael Kennedy, *Britten* (Oxford: Oxford University Press, 2001), 156.

[131] The prominent outline of a perfect fifth characteristic of the melodic "head" does much to establish the referential pitch; a connection may be drawn to the use of real—as opposed to tonal—answers in traditional fugal practice.

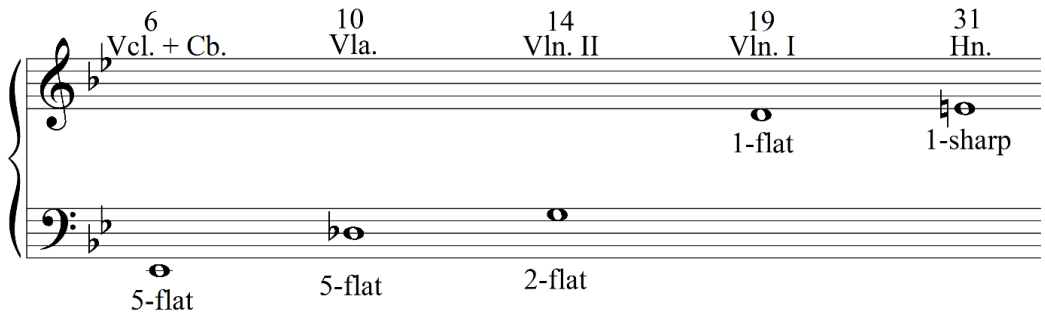


Figure 3.7: *Orchetral imitative entries in the first half of the Dirge, with measure of entry, collection, starting pitch and instrumentation labelled.*

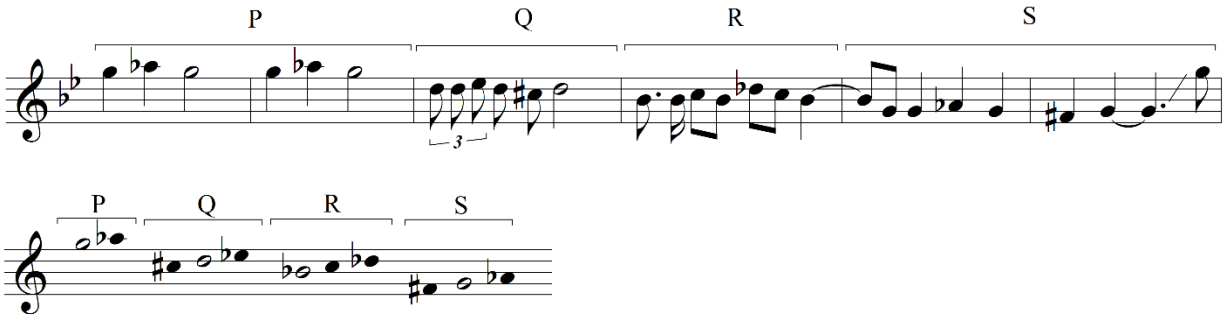


Figure 3.8: *G-centred analysis of the voice ostinato*

The voice ostinato, considered in isolation, projects both clear centricity on G and ambiguity of the enclosing collection. As Figure 3.8 shows, the ostinato can be segmented into four cells each emphasizing one member of a G minor triad. Of these cells, only R displays any scalar features that might point towards a governing scale or mode (the others chromatically decorating their key pitch); however, its D-flat clashes with the D-natural of cell Q, ruling out any diatonic interpretations of the entire line. Only the G-centred cells of the ostinato (P and S) contain "uncontested" pitches; this, combined with their role as upper and lower endpoints of an octave descent, advances G as a referential pitch without painting a clear picture of what collection might be associated with it.

Ambiguity (or perhaps extreme sparseness) of collection opens up space for additional strata to come and "fill in" the picture, providing a harmonic interpretation of the voice's referential G relative to their own pitch material. Britten exploits this potential by controlling the tonal distance of the voice from the centres and scales implied in the internal strata of the accompaniment, reserving complete agreement on one harmony for the dynamic high point of mm. 31-32, where

all forces converge on an E-minor triad. This high point, lying roughly at the midpoint of the movement, corresponds to the apex of the intensification-recession curve outlined previously.[132]

Similar occurrences of relative harmonic concordance are found at the outer ends of the curve, establishing these moments as straightforward formal markers of beginning, middle and end. The outer markers, however, feature clashes that mm. 31-32 do not. In m. 6, the entry of the cello and basses on E-flat (grounding the central G of the voice as a major third above a bass voice) faintly implies an E-flat major tonal region that not only accommodates the voice's G as a consonance, but also subsumes the structural G-minor triad of the voice ostinato. This impression, however, only lasts for the first three eighth notes of the measure, as the following string gesture outlines a scale based on an E-flat *minor* triad. At this moment, the overall impression thus shifts to one of a stratified texture that maintains the same referential pitch (E-flat), but is differentiated by collection, with the voice occupying a major-like space and the strings occupying a minor-like space. The disconnect increases at m. 9 as the voice moves away from G, its D clashing with the previously-heard D-flats in the ensemble. At m. 10, with the entry of a new stratum in the viola with D-flat as a referential pitch, the stratified conception of the movement becomes salient such that the independence of the voice stratum is firmly established; at this point, seeking a unified harmonic interpretation of all parts of the texture becomes counterproductive. Further convergences do occur between the voice and individual strata of the ensemble—the violin II stratum at m. 14, for example, shares the voice's G referential pitch—however, these convergences are subsumed into a more complex texture where sharp differentiation dominates over short moments of alignment. The situation in mm. 50-54 parallels that of mm. 1-6, only with the process operating in reverse. First, the string gesture of m. 5 returns, along with the major-minor harmonic interpretation of the voice discussed above. This gesture undergoes fragmentation from mm. 51-53 until the major-third combination of E-flat and G implied at the beginning of m. 6 remains, followed by the voice alone completing its iteration of the ostinato figure.

These three formal markers of beginning, middle and end, with the outer markers featuring a move to and from strongly-stratified textures, represent formal "signposts" marking an otherwise continuous rhetorical process. While the beginning and end stand out by virtue of their location at

[132] The barline of m. 28 represents the notational halfway point; considering only the bars in which the ensemble play, the halfway point lies in the middle of m. 30. M. 31 in both cases corresponds to a short time past the halfway point.

the start and end of a gradual process, the salience of the middle signpost is reinforced through both orchestrational *as well as* syntactical means. Considering texture, the entry of the horn and rhythmic/gestural unity of strings and voice combine with a dynamic peak (***ff*** in all string parts) to distinguish mm. 31-32 from their lower-dynamic, less gesturally unified surroundings. The story told by the *harmonic* alignment of the ensemble at m. 31, however, requires a more thorough look at the way in which differentiation operates over the entire movement. In fact, the internal stratification of the ensemble in the *Dirge* does not strictly adhere to the intensification-recession curve followed by textural parameters. Rather, the most strongly differentiated textures are located *between* the signposts of beginning, middle and end, while moments of relative unity surround the highpoint of m. 31.

In contrast to the Vaughan Williams passage analyzed previously, here precise identification of differentiating factors after the imitative entries of the beginning is more difficult. In mm. 21-23, for example, all string parts except the first violin combine into a chain of dominant seventh chords; this process is illustrated in Figure 3.9. The first violin, through gestural and harmonic means, seems to pull away from this dominant seventh chain. Its material may be interpreted in both unified and stratified ways. In the former case, each bar of the first violin's material may be assimilated into a tonality and an associated diatonic scale implied by the lower strings. In m. 21, the C and E represent notes of the tonic triad of A minor conceptually paired with the E dominant seventh of the lower strings, while in m. 22, the E and A represent chord members of the concurrent A dominant seventh. The following bar proves more complex: here, the first violin stands in for the "descending" C melodic minor scale, while the lower strings state its dominant, paired with the "ascending" version of the scale. This combination creates clashes between inflections of $\hat{6} - \hat{7}$ associated with these scales; while this represents a form of differentiation based on collection-type, its association with largely unified textures of common-practice music softens the resulting stratification, particularly when compared to the more striking types of differentiation employed elsewhere in the movement. The stratified interpretation more straightforwardly considers mm. 21-22 in the first violin a continuation of the "1-flat" collection and D referential pitch established in m. 19, and m. 23 as a shift to a more ambiguous, flatter collection based on the voice's concurrent pitch material (G and A-flat).

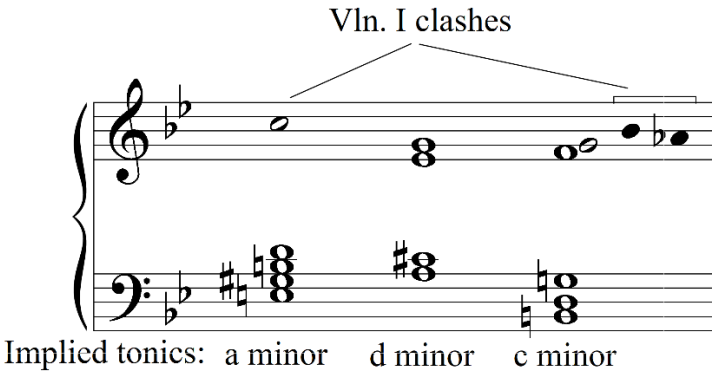


Figure 3.9: *Expression of dominant sevenths in mm. 21-23.*

Nevertheless, the passage immediately following—which also precedes the moment of alignment at m. 31—moves towards greater unity. From mm. 24-26, the contrapuntal texture that characterized the ensemble thus far gives way to a diatonic ("3-flat") scalar gesture, broken up into overlapping[133] segments. In mm. 27-29, the cello and bass break off from the upper parts *gesturally*; however, the sonorities of each measure can be parsed as extended tertian harmonies, as Figure 3.10 illustrates.[134] Overall, the measures preceding m. 31 exhibit a *preparatory* character, by tightening the ensemble's syntactic focus so that the arrival of the E-minor triad assumes meaning not only through its standout harmonic clarity, but also through representing a *tangible triadic shift* that would not be possible were its preceding measures unable to coalesce into tertian, tonally-relatable structures.

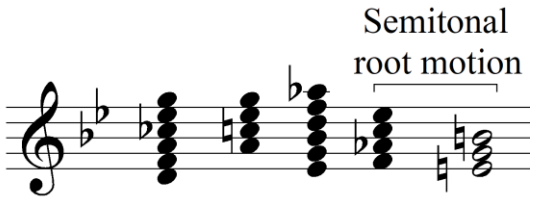


Figure 3.10: *Tertian sonorities in mm. 27-31.*

Turning back to the larger formal plan, then, statistical such as gestural and textural density as well as dynamic level trace a curve of intensification and recession delineated by formal markers at its ends and peak. Syntactic differentiation, however, breaks away from this curve in order to heighten the impact of the midpoint formal marker. In the following Vaughan Williams excerpt, syntactic

[133] Each segment arrives one note "too soon," creating second clashes that obscure their diatonic basis.

[134] Recalling Koechlin's discussion of extended triadic harmonies, alternate parsings that divide the texture into two differentiated subsets are available; however, they do not reflect the gestural lockstep of the upper parts.

differentiation will progress in lockstep with formal organization, here syntactic differentiation is independent from the smooth formal curve, diverging from it in order to reinforce an rhetorical point expressed closer to the surface.

Conclusion

> "Polytonalité… le mot fascine, effraie ou génère même parfois l'hostilité : dans tous les cas, cette forme d'écriture laisse rarement indifférent."
>
> "Polytonality… a word that fascinates, scares or at times even generates hostility: regardless, this type of writing rarely leaves one feeling indifferent."[135]

Considering the opening of Malhaire's *Polytonalité* once again, the fear associated with the namesake term seems perhaps overblown. Effectively, though a substantial body of polarized research exists on the topic, the debates within arise more out of a lack of a clear, communally agreed-upon theoretical and terminological framework for theorizing layered musical construction than any fundamental conceptual disagreements. The differentiation model represents a potential starting point for such a framework to emerge, replacing loaded *poly-* isms with language more in line with contemporary music theory and modelling musical strata in a parametric, less historically or stylistically loaded way. Consequently, using the differentiation model as an analytic tool for describing stratified textures will allow future research to achieve cleaner, more meaningful insight into superimposed pitch languages.

[135] Philippe Malhaire, *Polytonalité: Des Origines Au Début Du XXIe Siècle, Exégèse D'une Démarche Compositionnelle* (Paris: Harmattan, 2013), 13.

Annex: Overview of terminology from Chapter 1

In Chapter 1, I reviewed a number of publications relevant to the topic of layered musical construction. In this glossary, I regroup the most important terms coined in these publications and interprets them using the terms of the differentiation model. Some of these terms suffer from a lack of specificity; accordingly, this translates to difficulty in pinpointing the types of differentiation they might engage. In other cases, more complex, successfully implemented concepts invoke multiple possible varieties of differentiation.

Terms from Malhaire, "Refonder la Théorie Polytonale" in *Polytonalité*

Polymusic (Polymusique)

Malhaire defines "polymusic" quite broadly, as a juxtaposition that results in hearing multiple "musical entities, each conceived of perfectly independently."[136] Effectively, "polymusic" refers to the perception that each stratum of the overall texture could be sourced from *an entirely different composition*. Malhaire argues that polymusical textures often make use of polytonality and polyrhythm; he cites a passage by Nielsen that combines differentiated pitch organization with a superimposition of different tempi and sharp orchestrational contrasts.[137] When viewed through the lens of the differentiation model, "polymusic" corresponds to high-intensity stratification necessarily invoking conflicts of style or affect; however, no specific differentiating factors are considered prerequisite.

Polysystem (Polysystémie)

For Malhaire, polysystem represents a more generalized version of polystylism as well as a subtler derivative of polymusic in which the strata, though perceived as belonging to the same composition, respect distinct compositional constraints or make use of different composition pitch

[136] "Êtres Musicaux conçus de manière parfaitement indépendante," Malhaire, "Refonder la Théorie Polytonale," 25. The discussion of the term takes place from 24-28.
[137] See Malhaire, *Polytonalité*, 27.

organizational principles entirely.[138] Malhaire defines polysystem as the combination of "musical elements conceived according to different compositional systems—tonality, atonality, serialism, etc."[139] Especially considering the weakness of the Satie example Malhaire provides to support this definition,[140] "polysystem" seems rather catch-all, describing textures that engage a significant amount of differentiating factors relating to pitch organization but falling short of being able to quantify *which* parameters clash.[141]

Polytonality in the strict/broad sense (Polytonalité au sens strict/large)

As described in Chapter 1, both of these "polytonalities" mandate that diatonic, tonal materials be used across all strata. In the strict sense, however, each stratum adheres closely to traditional practices of harmony and voice leading, whereas, in the broad sense, the strata may express tonal relationships in freer ways not bound by common-practice conventions.[142] Each sense effectively imposes different constraints on the functional expression of each stratum, with the strict sense requiring it, and the broad sense allowing for divergence. Both polytonalities, meanwhile, engage both differentation of referential pitch and of collection—respecting the more restrictive, key-based definition of polytonality.

Polydiatonicism (Polydiatonie)

Malhaire coins this term as a replacement for Milhaud's "contrapuntal polytonality." Polydiatonicism refers to a combination of diatonic, tonal strata that are each conceived of melodically, written monophonically without chordal components. Each strata employs a different diatonic scale, producing salient contrasts of collection.[143] This term, in the eyes of the differentiation model, carries the same pitch organizational connotations as does the previously-described "polytonality." However, it specifically designates the texture as wholly contrapuntal,

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[138] *Ibid.*, 28-30

[139] *Ibid.*, 29.

[140] The choice of the opening of Satie's "Méditation" from the *Avant-Dernières Pensées* (1915) as an illustrative example is perplexing. Both lines are assimilable to the "2-sharp" diatonic collection, reducing the intensity of stratification significantly; furthermore, while the top line displays a quartal arrangement that contrasts with the lower line's scalar configuration, these differing configurations do not represent *different systems of pitch organization* entirely—only differences in *harmonic location*. *Ibid.*, 29.

[141] Curiously, Malhaire does not cite an example of a chromatic, atonal stratum being superimposed on a tonal stratum—potentially relevant excerpts here might be those of Figures 2.14-2.15.

[142] Discussion in *Ibid.*, 30-34.

[143] *Ibid.*, 34-35.

thereby equalizing the textural role of each stratum and enabling syntactic differentiation to operate through use of contrasting rhythmic patterns.

Polymodality (Polymodalité)

Malhaire separates the notion of polymodality into multiple sub-categories. He adopts Tymoczko's term "polyscalarity," which shall be discussed below; additionally, he discusses the idea of "uniscalarity," major-minor superimposition, and simultaneous presentation of triads with their altered third or fifth.[144] The strata involved in all of these subcategories shun references to traditional functions, rendering differentiation on the basis of functional expression and harmonic function impossible. Additionally, the wide range of scales available to strata entering into a polymodal relationship unlocks the possibility of differentiation by collection type, unavailable in a polytonal context where diatonicism is assumed.

Polylinearity/Polymelody (Polylinéarité/Polymélodie)

Malhaire defines polylinearity (and a synonym, polymelody, that he lifts from previous scholarship) as a combination of melodically-conceived strata that are perceived as operating independently.[145] There is considerable overlap with polydiatonicism here, to the extent that Malhaire considers it a diatonically-oriented subset of polylinearity. Effectively, the term refers to a similar contrapuntal textural configuration, but does not impose any constraints on the presence or absence of differentiated pitch organization. This definition proves quite broad; while linear independence implies a greater intensity of stratification than is characteristic of common-practice counterpoint, the concept remains vague as to how this greater stratification may be achieved syntactically.

Polyharmony (Polyharmonie)

Malhaire defines polyharmony as the consistent use of polychords over a given passage of music; these polychords in turn represent audibly-stratified superimpositions of tertian components.[146] Polyharmony imposes very few constraints on pitch organization; effectively, only that it displays a recognizable tertian structure. This structure translates to a limitation of each stratum to the use

[144] *Ibid.,* 35-41.
[145] *Ibid.,* 41-44.
[146] *Ibid.,* 45-47.

of only a handful of admissible set classes; in this sense, adherence to similar collection types is enforced on the most local level. Scales implied by successive triadic roots, melodic content of conceptual top voices, or chord successions' adherence or not to traditional harmonic practice do not affect whether a passage qualifies as polyharmonic, the only criterion being regular appearance of compound constructs, tertian and internally differentiated by collection.

Polyfunction (Polyfonctionnalité)

Malhaire defines polyfunction as the superimposition of divergent tonal functions within the same key. [147] The term corresponds quite neatly to differentiation of harmonic function operating in the absence of any other types of pitch organization differentiation.

At this juncture, reviewing terms from *Polytonalité* warrants a look back at the discussion of figure 1.10. The convoluted overlaps characteristic of this terminological web cause ambiguity in identifying the differentiating factors involved in each term. Though each term does carry a set of meaningful connotations—stylistic ones in particular—shifting to less stylistically loaded, more granular terminology conceived from a purely theoretical basis allows access to deeper theoretical insights; the analyses of Chapter 3 demonstrate this.

Other terms

Primary/Secondary priority (Kaminsky)

Kaminsky's mode of analysis takes into account the relationship between high and low registers; effectively, for him, the establishment of a polytonal texture depends on "whether and to what extent the treble can resist assimilation by the bass and retain its own distinct identity and priority."[148] Conceived of as an analytical tool suited to the works of Ravel, Kaminsky's notion of priority applies to diatonic-aligned expressions of referential pitch, tertian structures and occasional references to tonal function. In the eyes of the differentiation model, it therefore restricts strata to (at minimum) weak functional expression and to employing a limited set of collection

[147] *Ibid.*, 47-53

[148] Peter Kaminsky, "Ravel's Late Music and the Problem of 'Polytonality,'" *Music Theory Spectrum* 26, no. 2 (Fall 2004), 241.

types (largely diatonic, with octatonic, whole-tone and altered versions of these scales as additional possibilities). Expressing this concept in terms of salience of bass and top voice additionally imposes tight statistical constraints, mandating strong differentiation of register and textural role.[149]

Polyscalarity (Tymoczko)

Tymoczko's polyscalarity involves the superimposition of strata that "suggest different source-collections."[150] For Tymoczko, these source-collections represent—at least, in the context of Stravinsky analysis—"canonical" scales, such as the major, harmonic minor, octatonic or whole-tone. The basic definition of this term may be broadened, however, to include all divergences of set class; it would then correspond to differentiation on the basis of collection type, making no *a priori* statements about any other differentiating factors.

Dissociation (Rogers)

Rogers' notion of dissociation shares a kinship with differentiation, and indeed much of my work of Chapter 2 owes a debt to it. For Rogers, dissociated strata must not only distinguish themselves texturally through statistical divergences of register and timbre, but must also demonstrate a "self-sufficient pitch organization;"[151] effectively, they must undergo pitch organizational differentiation of some type. The notion of dissociation proves extremely useful for distinguishing strongly syntactically differentiated textures of the early twentieth century from the more weakly stratified, syntactically unified textures more characteristic of common-practice tonal music. Additionally, it provides a potentially useful shorthand for syntactic differentiation without as many connotations as does "polytonality."

Tonal Stratification (Rupprecht)

Similarly to Rogers' dissociation, Rupprecht's concept of tonal stratification invokes a combination of statistical separation with syntactic divergence. Though the two concepts overlap

[149] The differentiation model does not integrate analysis of the relative perceptual weight of strata; effectively, priority represents a concept that lies partially outside its scope, involving a more nuanced consideration

[150] Dmitri Tymoczko, "Stravinsky and the Octatonic: A Reconsideration," *Music Theory Spectrum* 24, no. 1 (Spring 2002), 84.

[151] Lynne Rogers, "Dissociation in Stravinsky's Russian and Neoclassical Music," *International Journal of Musicology* 1 (1992), 202.

substantially, tonal stratification shows a preference for techniques of pitch organization that imply referential pitches and references to tonality and triadic organization. The complexity and uniqueness of Britten's musical language make tonal stratification a concept quite specific to Rupprecht's work; in Chapter 3, I give an overview of a Britten excerpt of much more limited scope.

Bi-quintal Structure (Straus)

Straus' notion of bi-quintal structure involves the superimposition of two diverging presentations of interval class 5, "filled in" in different ways. Additionally, each presentation takes on a contrasting textural role—either chordal (background) or melodic (foreground). Differentiation of collection type, combined with textural role, define this superimposition.

Octatonic Poles (Berger, van den Toorn)

The notion of octatonic "poles" advanced by Berger, and later adopted by van den Toorn, proves more abstract than previous terms. It effectively represents a competition between two potential referential pitches within a single collection (an octatonic scale); however, these referential pitches are not expressed using traditional tonal means. Rather, they represent important pitches that are used to exploit the structural potential of the octatonic; in this sense, they may represent triad roots, inversional axes, or generators of set classes contained within the overarching scale. According to the differentiation model, this concept distinguishes itself from "polytonality" by loosening restrictions on collection types and functional expression; effectively, octatonic poles do not represent tonal centres. This distinction also informs the discussion of the *Petroushka* chord reviewed in chapter 1: the polytonal interpretation effectively implies a superimposition of referential pitches and diatonic-aligned collection types, while the octatonic (or simply non-polytonal) interpretation only identifies a superimposition of two distinct collections, refusing to overlay any additional implications onto the component parts of the sonority.

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Scores

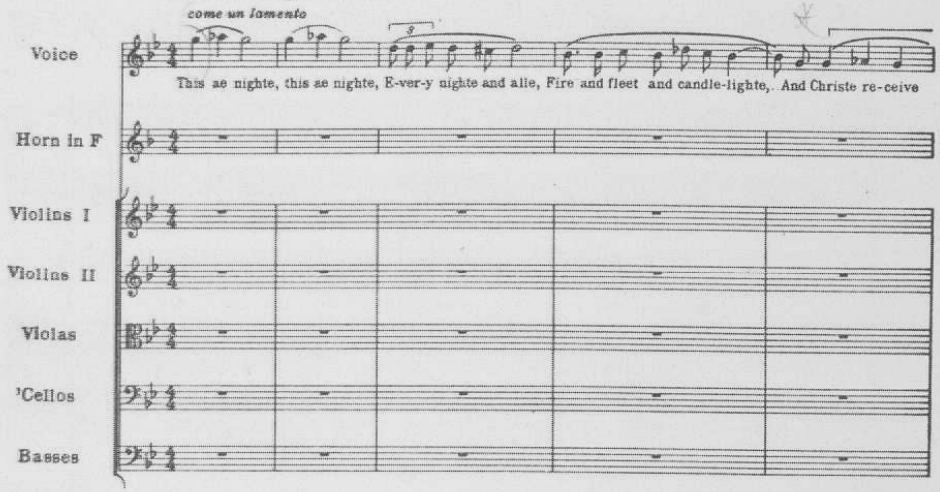
1) **Britten, "Dirge" from *Serenade for Tenor, Horn and Strings* (1943). Score reproduced with permission from Boosey & Hawkes.**
2) **Ireland, "For Remembrance" (1921). Score in public domain.**

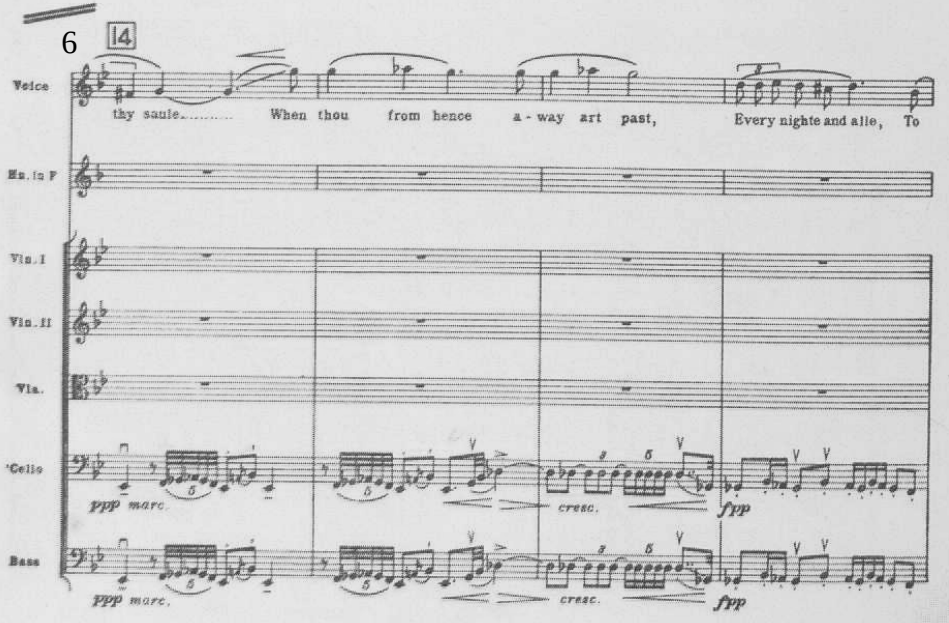
DIRGE

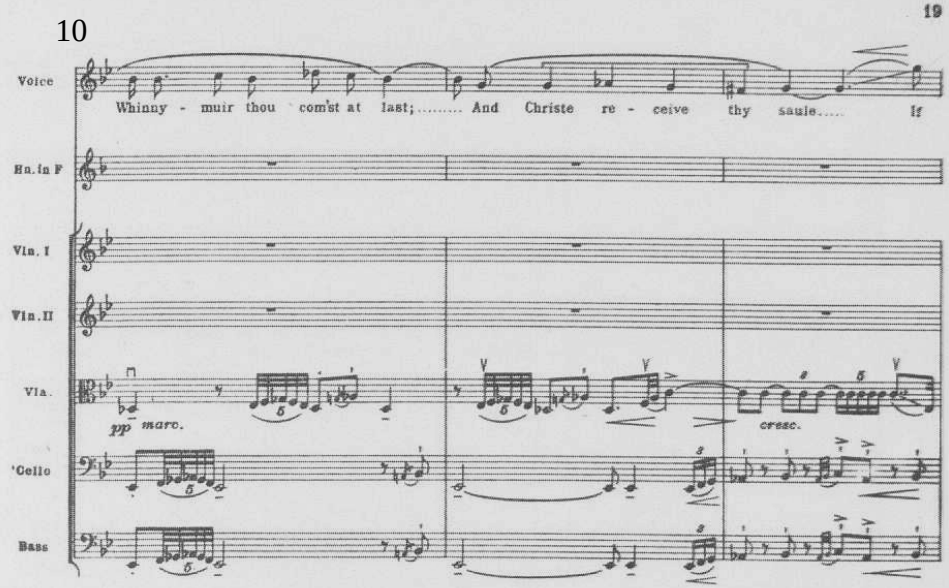
(Anonymous, 15th Century)

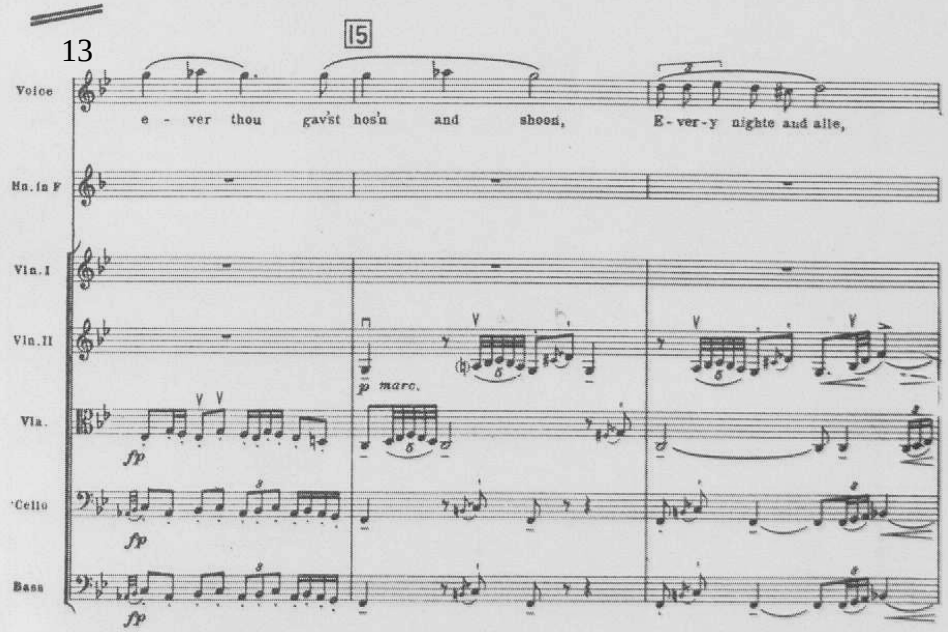
Alla marcia grave (♩ = 60)

come un lamento









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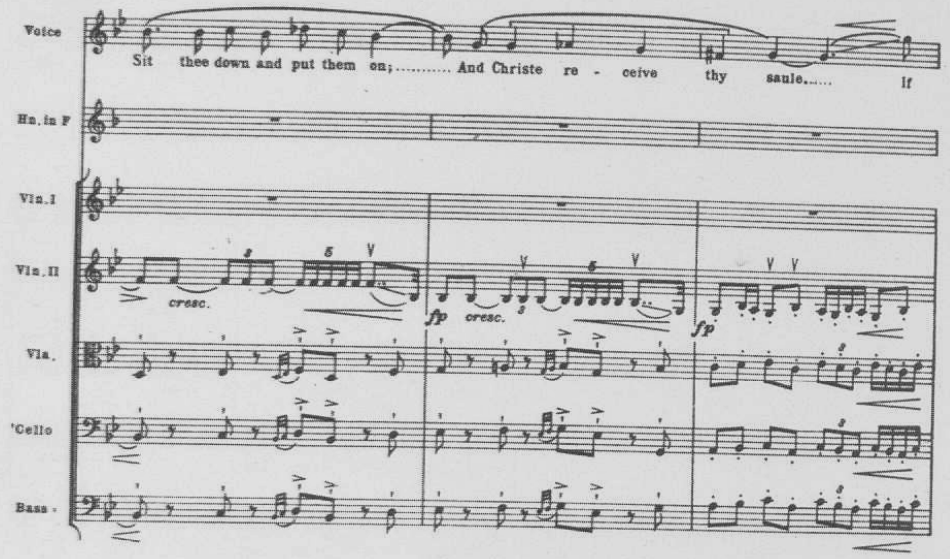

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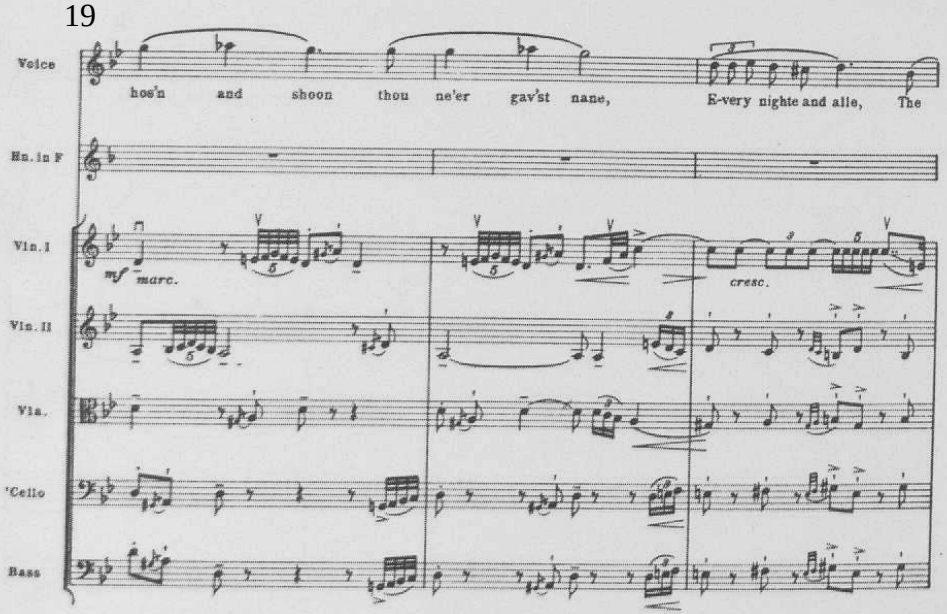

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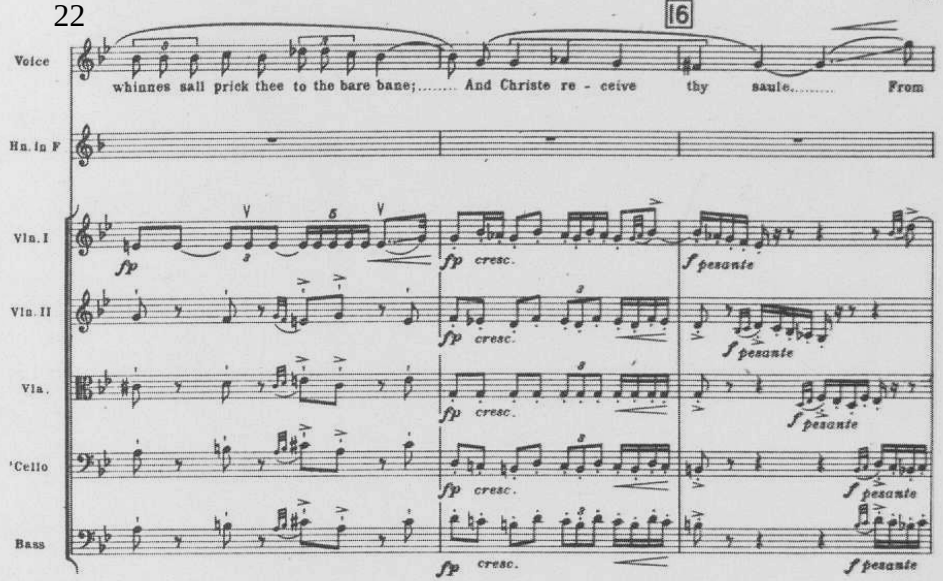

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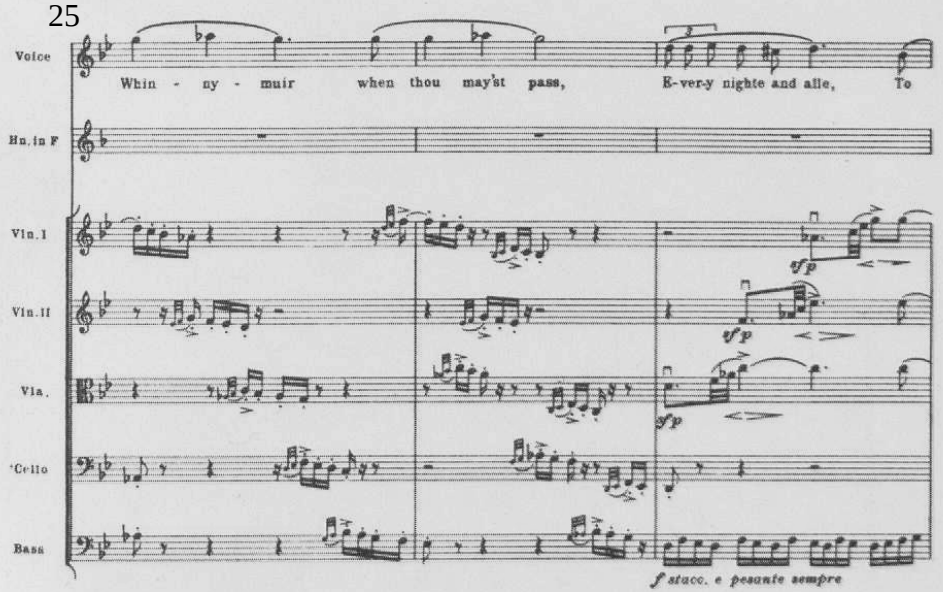

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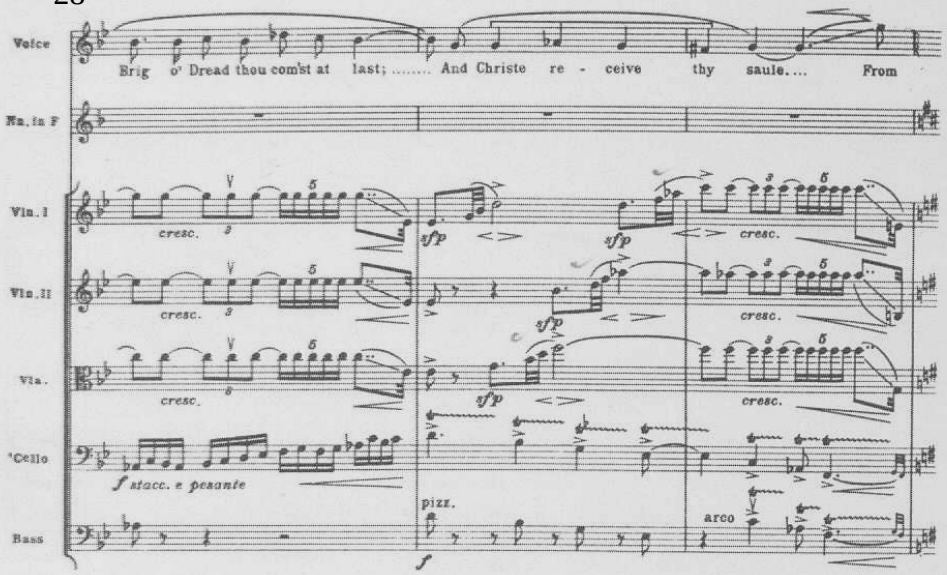

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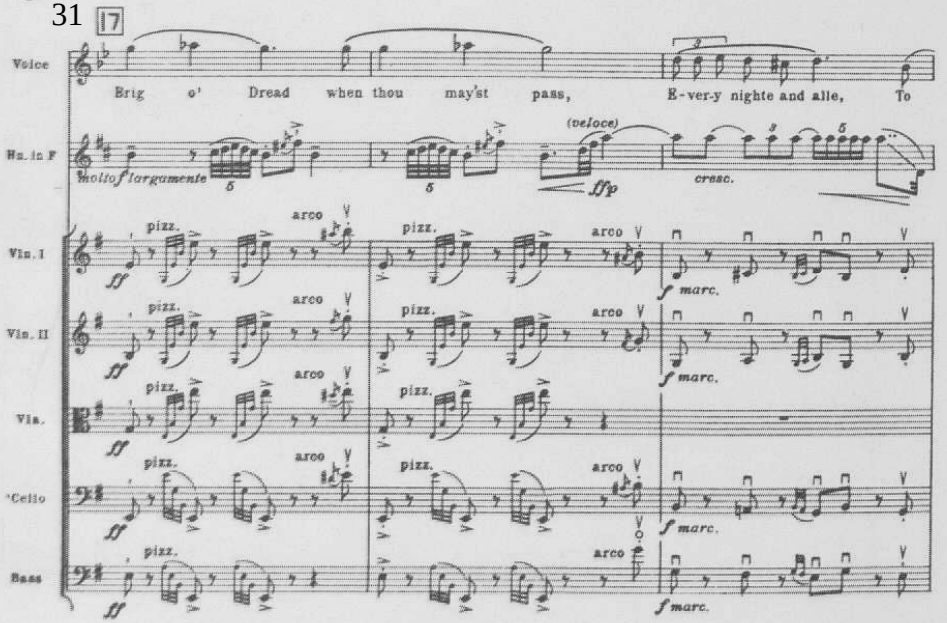

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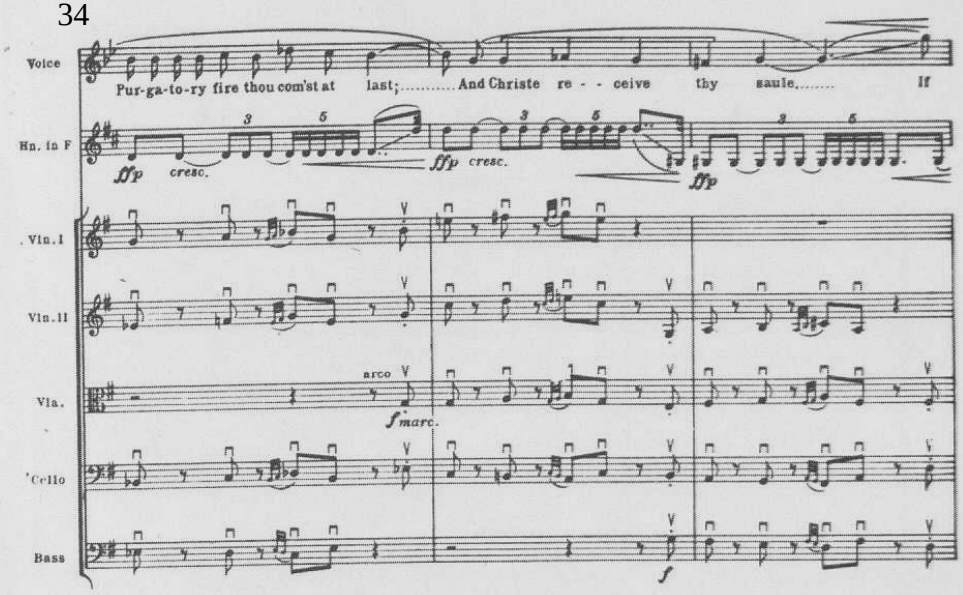

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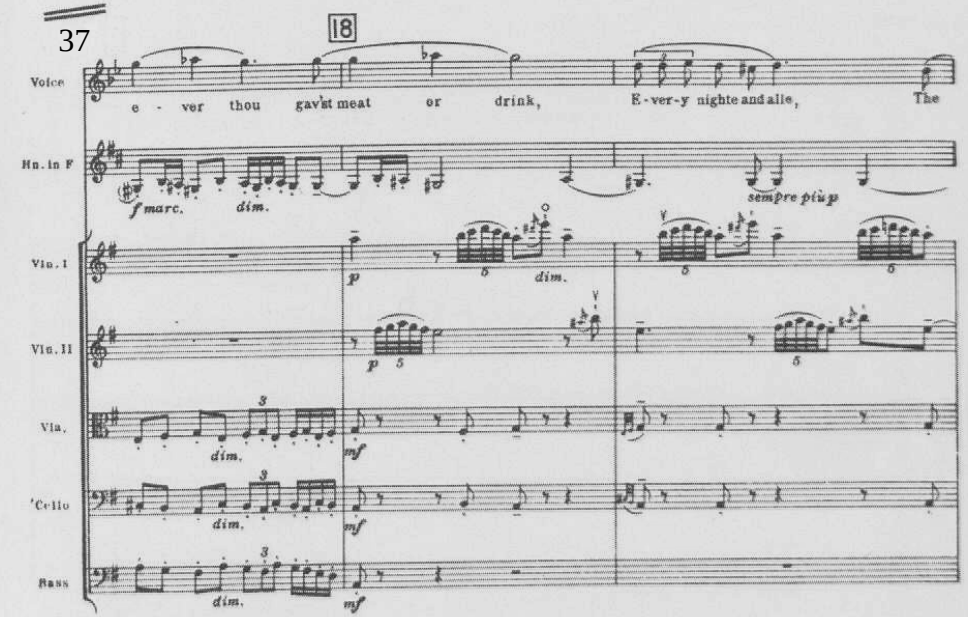

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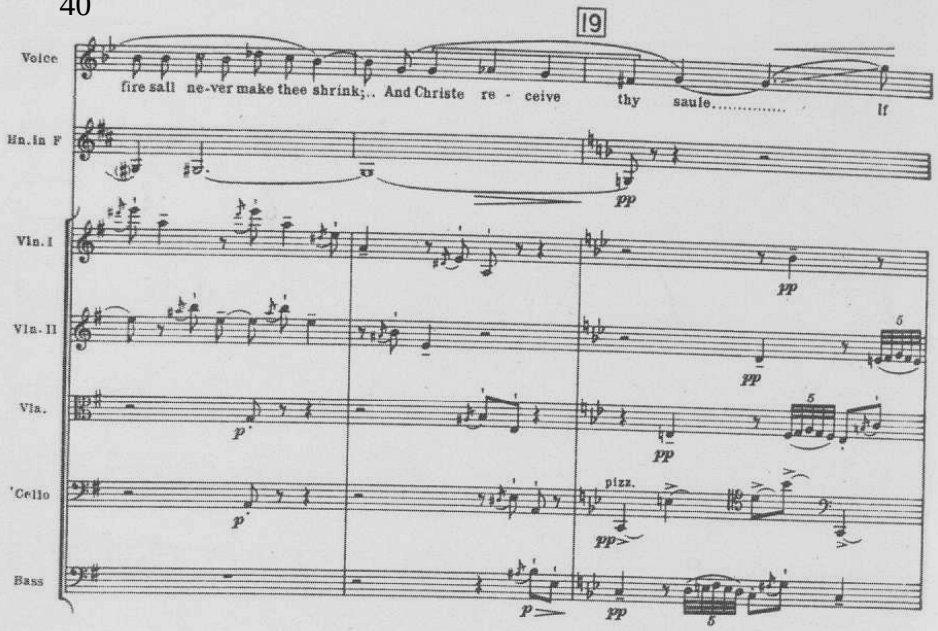

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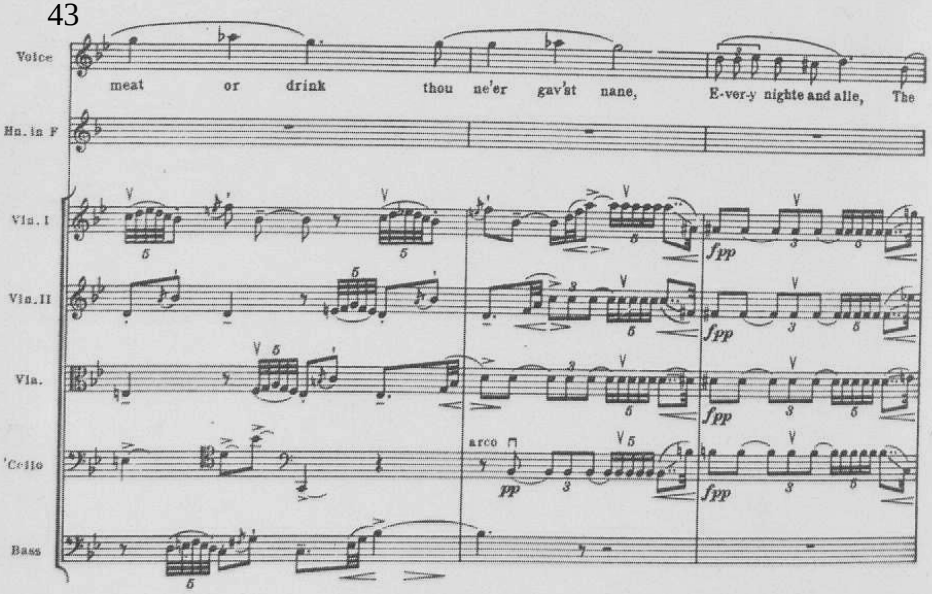

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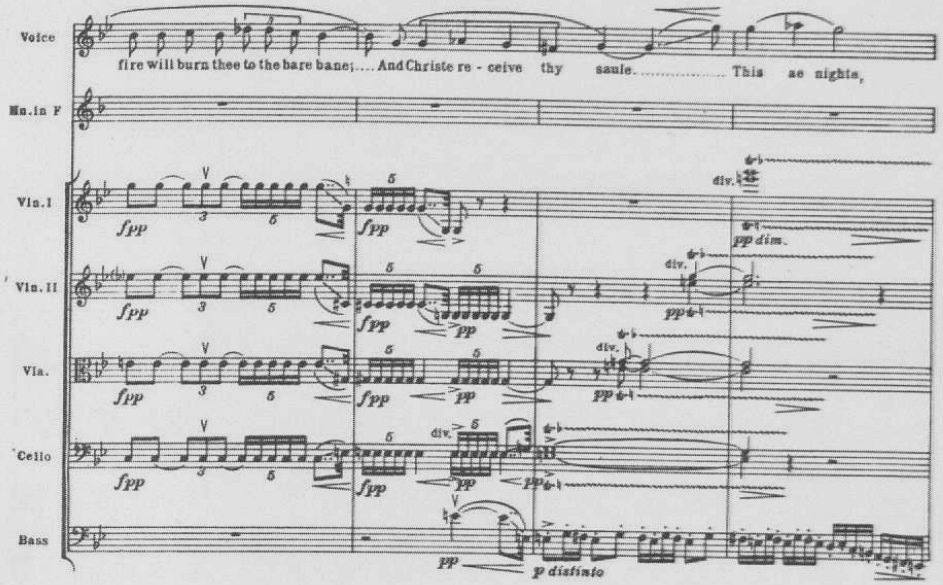

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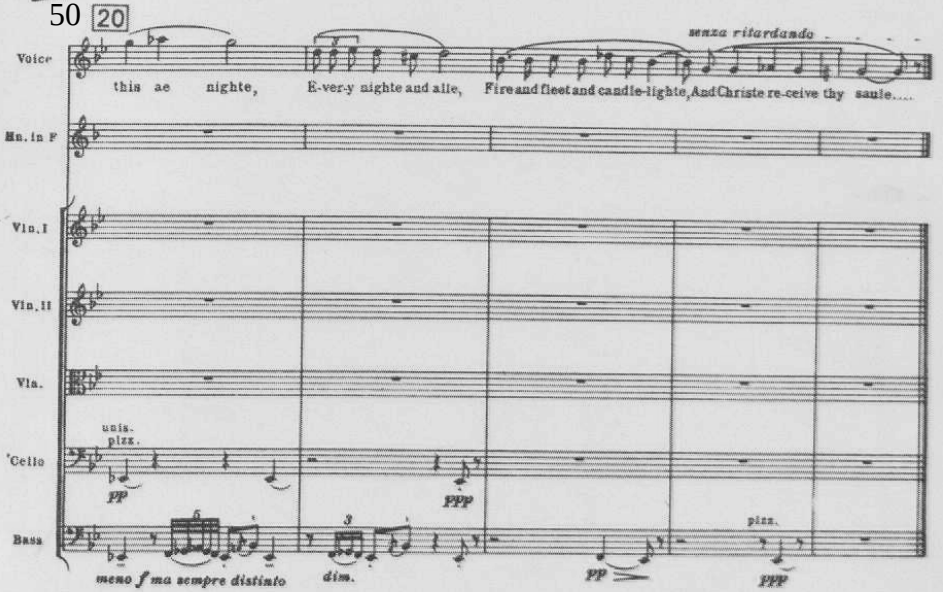
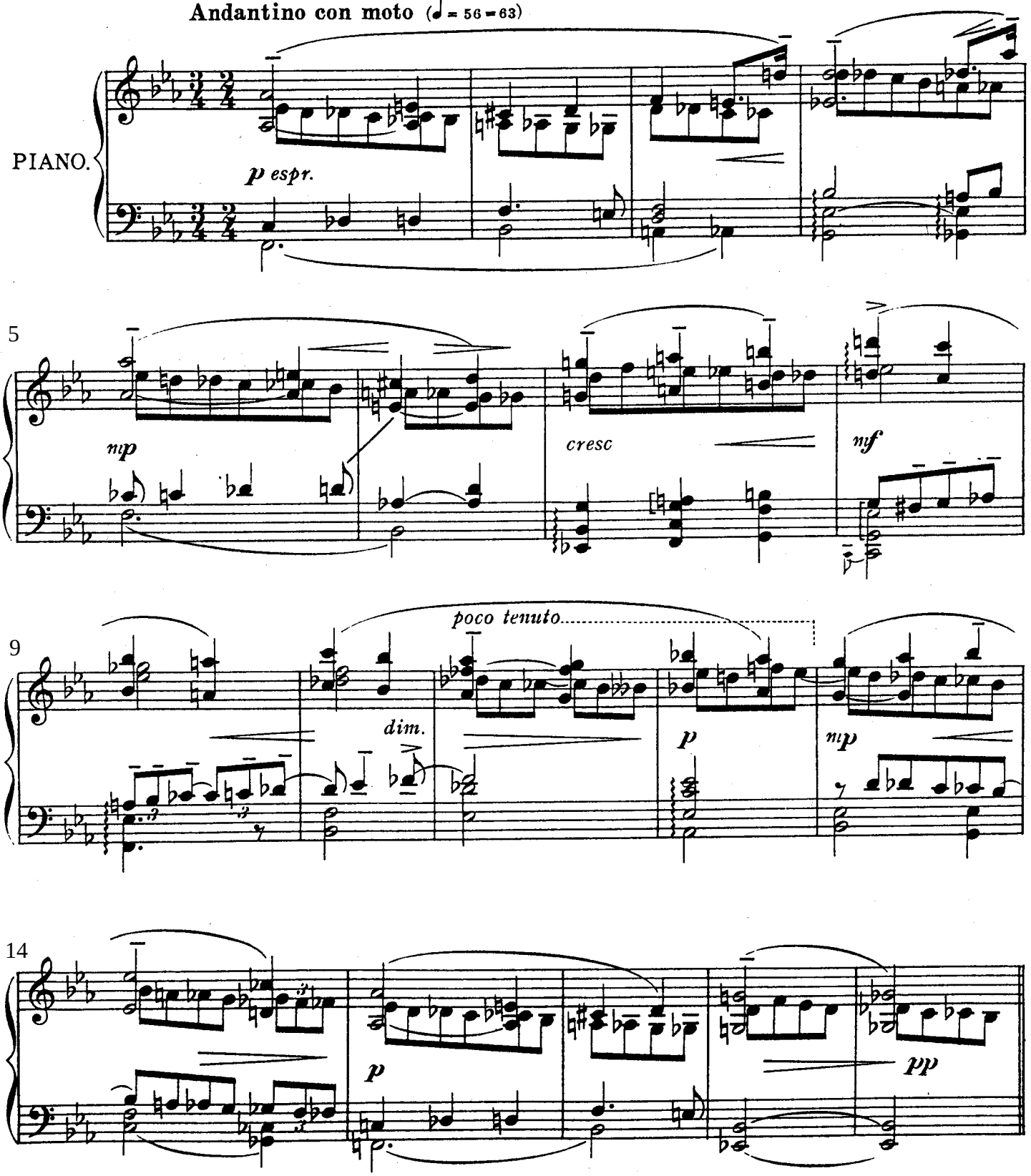
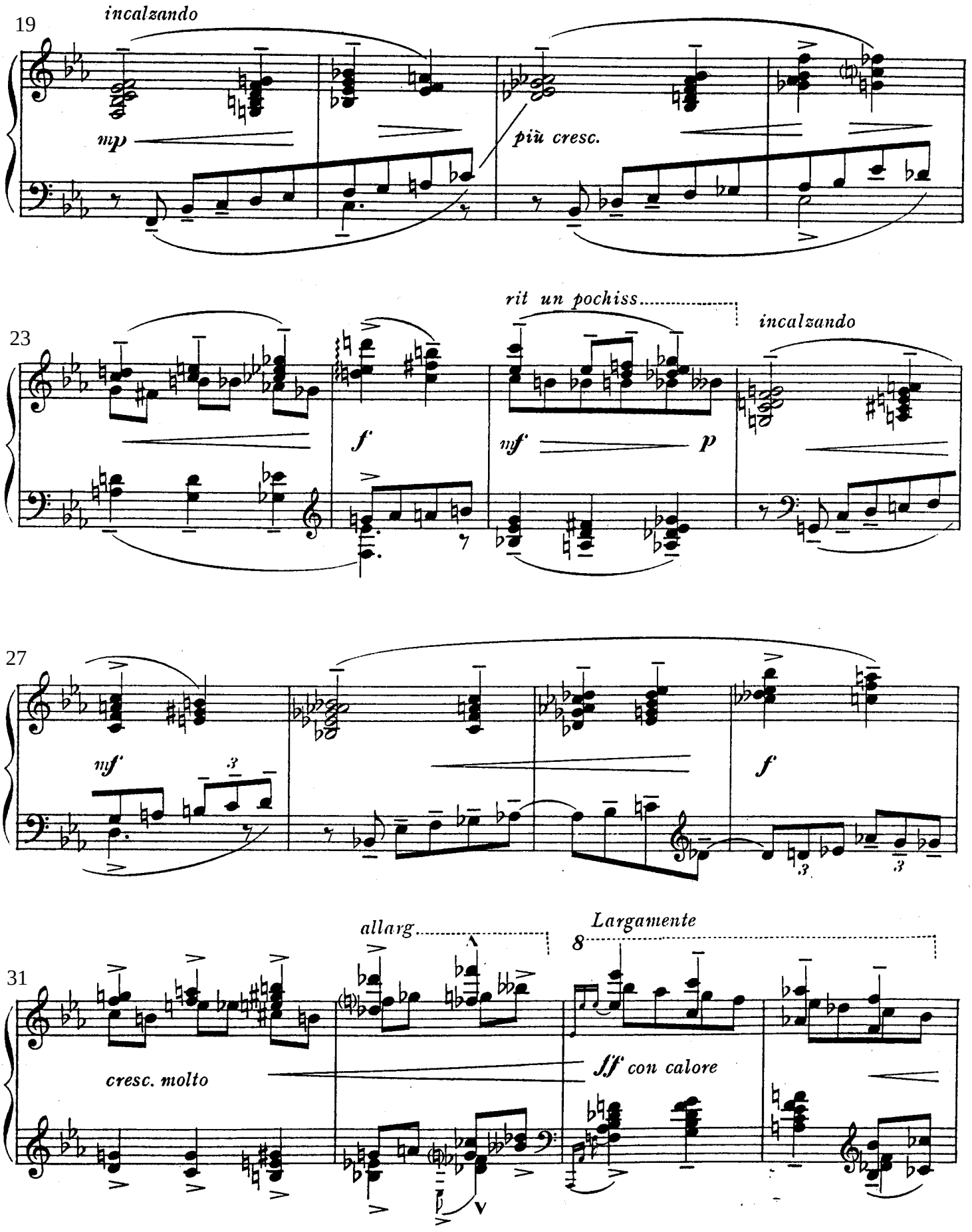


FOR REMEMBRANCE

John Ireland

Andantino con moto (♩ = 56 - 63)

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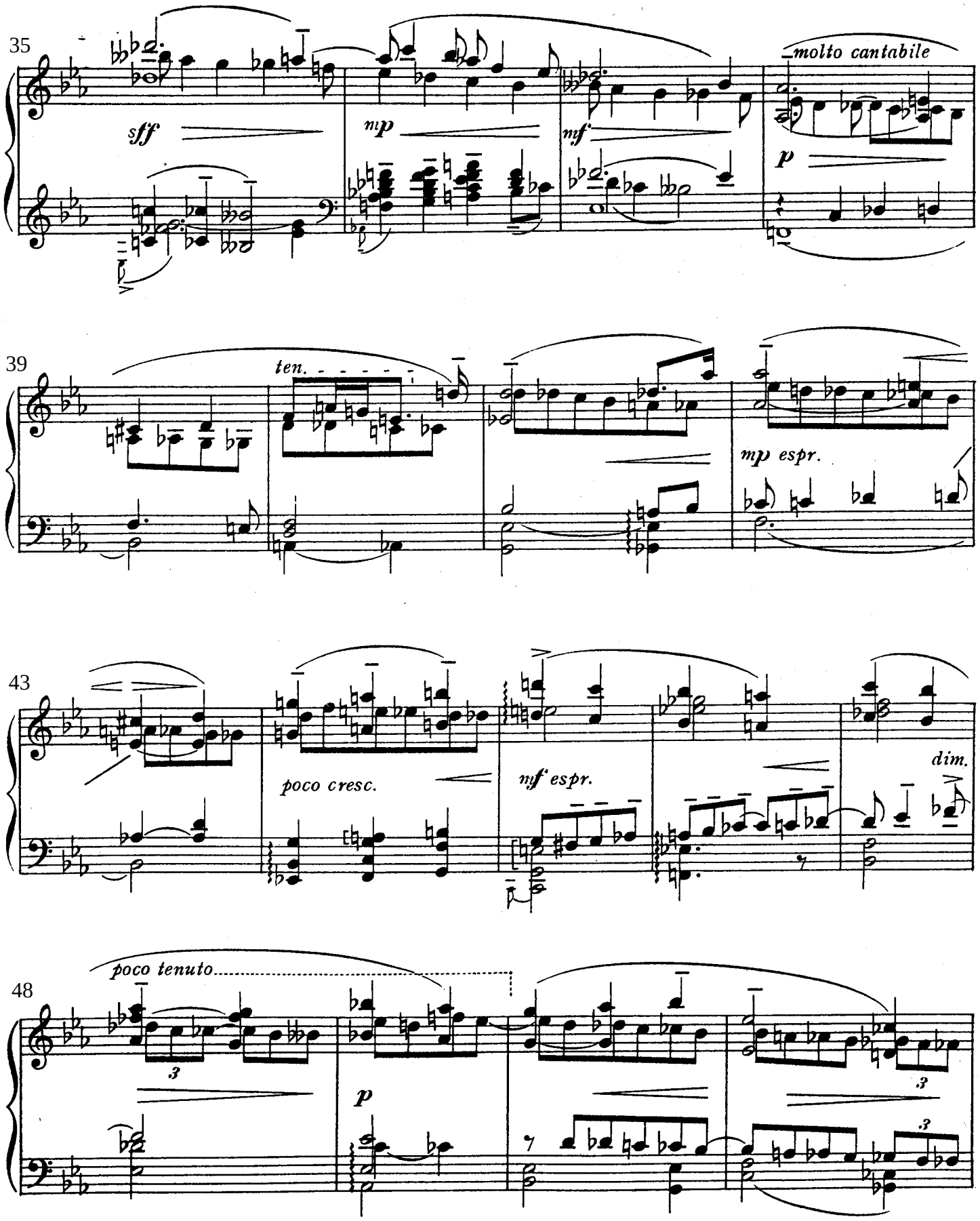
incalzando
mp
più cresc.
23
rit un pochiss
incalzando
f
mf
p
27
mf
3
f
31
allarg
Largamente
8
cresc. molto
sf con calore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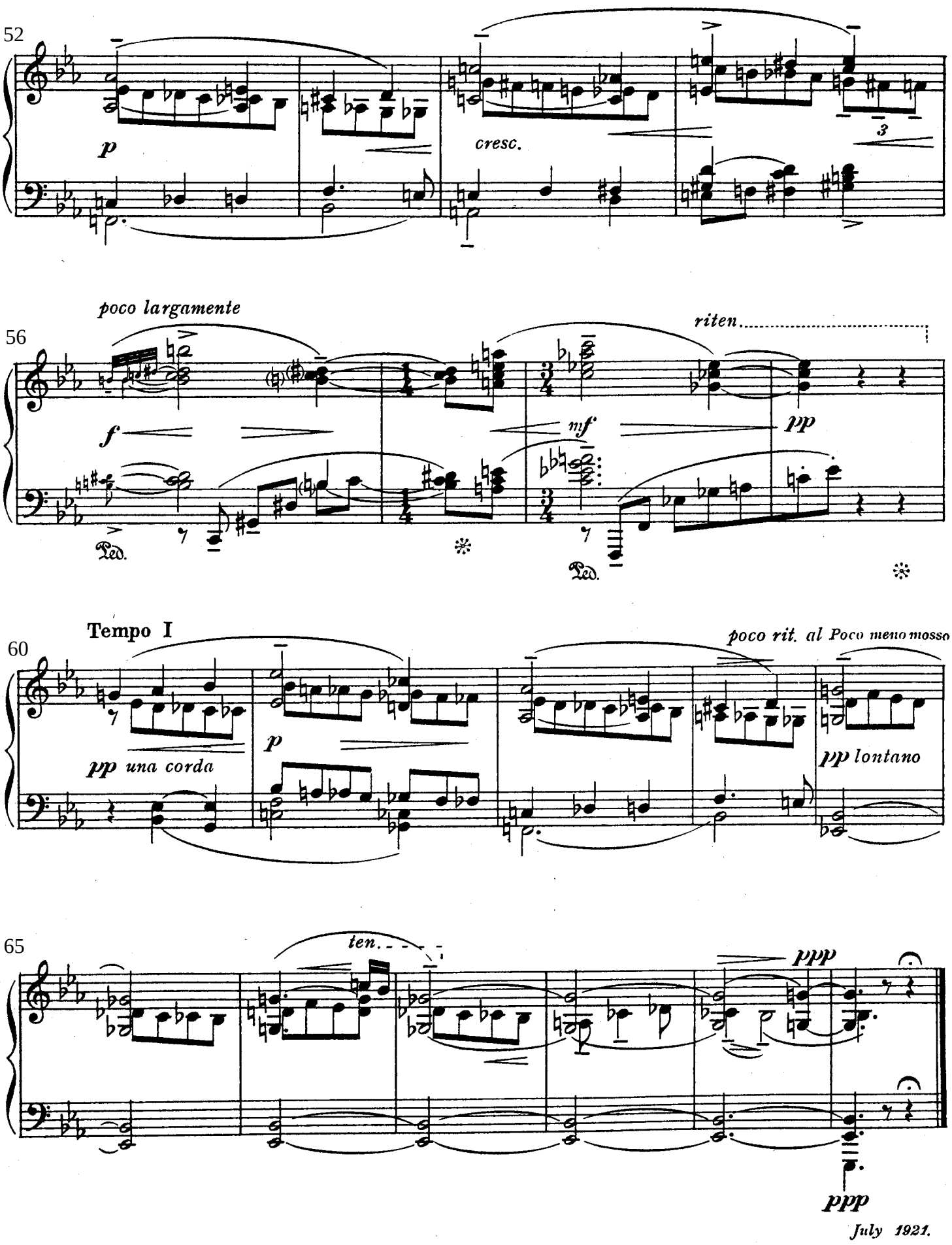
sff
mp
mf
molto cantabile
p
39
ten.
mp espr.
43
poco cresc.
mf espr.
dim.
48
poco tenuto
3
p
3
3


52
p
cresc.
3
poco largamente
56
riten.
f
mf
pp
Ped.
Ped.
Tempo I
60
poco rit. al Poco meno mosso
pp una corda
p
pp lontano
65
ten.
ppp
ppp

July 1921.