

ANALYSIS OF LINE AND SONORITY IN PIANO
SONATA, OPUS 1, BY ALBAN BERG

Thesis for the Degree of M. M.
MICHIGAN STATE UNIVERSITY
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1972



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ABSTRACT

ANALYSIS OF LINE AND SONORITY IN PIANO SONATA, OPUS 1, BY ALBAN BERG

By

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After a biographical sketch of Berg and a discussion of the chief trends in music of the late nineteenth century, analysis proceeds in three sections: (1) a general description of the sonata and its form, (2) melody and motivic development, (3) harmony and harmonic progression. Throughout the paper, where appropriate, historical precedents are mentioned.

In the first of these sections the plan of the work is given. The one-movement work is easily divided into exposition, development, and recapitulation. To assess its overall proportions, an outline of the sonata is tabulated with specific measure numbers, thematic material, keys, and dynamic levels.

With respect to melody, the topics of range, interval frequency, and the use of appoggiaturas and anticipations are studied. Chord outlines occurring melodically are also examined. Analysis of motivic construction and development

deals with motive similarity, substitution, fragmentation, regrouping, and metamorphosis.

Concerning harmony, the topics of harmonic ambiguity, treatment of dissonance, isolated sonorities, and chord progression are explored. These center around the problems of analysis encountered in dealing with the complex harmonic idiom found in Berg's Piano Sonata, specifically, and in music of approximately 1890-1910, generally. Principles adopted to overcome these problems include considerations of voice leading, harmonic implication, and function. In treating dissonance the concept of resolution is expanded to include patterns frequently found in the sonata. With regard to chord progression, the concept of harmonic allusion is employed: A progression which can be analyzed as a modification of a simpler prototype, such as V-I, is termed an allusion. Non-functional progressions are also discussed. This section contains a table of frequencies of isolated sonorities found in the sonata. The last item of the section is a description of the Piano Sonata from the harmonic viewpoint.

General examination of the work shows the first theme to be in the key of B minor, the second theme in A major during the exposition, in B major during the recapitulation. Key definition is not always clear, however, as there are many areas of suspended tonality, notably in the development. Areas in which the pitch level rises are found to be

almost invariably accompanied by the marking "crescendo ed accelerando."

The range of the melodic line is found to be quite expansive. A study of the first theme area alone reveals that the upper line traverses a distance of a perfect eleventh every three measures, on the average. A study of intervals of the uppermost voice reveals two noteworthy tendencies: First, the smaller the interval, the more frequently it is used; second, large intervals are generally used ascending, small intervals descending. A comparison of the use of appoggiaturas and anticipations in the first and second theme areas of the exposition reveals differences in usage dependent on theme area.

The dissonance-resolution patterns found most often include normal, displaced, simultaneous, and dissonant resolutions.

The table of isolated sonorities reveals seventh chords of the diminished-minor and major-minor varieties to be most frequent, with augmented triads next most frequent. Ninth chords, augmented-minor seventh chords, and perfect quartal chords also occur with high frequency.

Prototypes of harmonic allusions most often found are V-I, V-vi, IV-V, and, less often, IV-I. Typical of non-functional progressions is the oblique-motion device found at climactic points of the sonata. In such cases a chromatically moving bass provides a changing harmonic context

for a sustained or repeated tone in the soprano. The trend to allow chromatic movement in the bass to determine harmonic flow is further demonstrated by a study of the bass line throughout the sonata, which reveals that instances of movement by half-step outnumber all other types of bass movement combined.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF MUSIC

Department of Music

1972

573111

ACKNOWLEDGMENT

My thanks to Dr. Paul Harder for many helpful suggestions and criticisms.

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CHAPTER I

BIOGRAPHICAL SKETCH AND HISTORICAL SETTING

About a month before the death of Gustav Mahler, Alban Berg's Piano Sonata, Op. 1, was premiered in Vienna. The date was April 24, 1911. The only review which Berg's biographer, Willi Reich, was able to locate reads in part:

. . . Mr. Berg has written a piano piece (boldly entitled "Piano Sonata") which shows traces [spaced out in the original] of talent and musicality.¹

The sonata was finished in the summer of 1908 while Berg was a student of Arnold Schoenberg. Completed at Berghof, the Berg family's country home, it was then published in Berlin in 1910.

The general tone of the work is highly expressive and intense, a reflection not only of the general characteristics of the expressionist style, but also of the personality of its composer. Berg's emotional makeup is revealed in his letters to his friend Hermann Watznauer, and in those to his bride-to-be Helene Nahowski; these are alternately effusive and introspective. And, although it is passed over with a somewhat perfunctory air in Reich's biography, his suicide attempt (over a love affair) at the age of seventeen certainly indicates a deeply sensitive nature. In short, Berg's personality was that of a romantic.

¹Willi Reich, The Life and Work of Alban Berg, trans. Cornelius Cardew (London: Thames and Hudson, 1965), p. 34.

If the influences of Berg's character on the work are apparent, the musical influences are also not particularly difficult to trace, either. Schoenberg, it is known, had a great influence on his student Berg. Also well-known is Berg's admiration for the music of Wagner and Mahler. During the discussion of the Piano Sonata, Op. 1, specific cases of musical influences will be shown.

Before beginning the general description of the sonata, it would be appropriate to present a chronology of several important works which appeared before 1908, the date of the sonata. This, together with a discussion of the musical trends they demonstrate, will serve to place Berg's opus in historical perspective.

- 1865 Wagner: Tristan und Isolde
- 1868 Wagner: Die Meistersinger
- 1876 Wagner: Der Ring des Niebelungen
- 1881 Bruckner: Symphony No. 4
- 1882 Wagner: Parsifal
- 1885 Bruckner: Symphony No. 7
- 1890 Strauss: Tod und Verklaerung
- 1894 Debussy: L'Après-midi d'un Faune
- 1895 Mahler: Symphony No. 2
- Strauss: Till Eulenspiegels lustige Streiche
- 1896 Scriabin: Piano Concerto No. 1
- 1898 Strauss: Don Quixote
- 1899 Bruckner: Symphony No. 6
- Schoenberg: Verklaerte Nacht

- 1900 Debussy: Nocturnes
- 1901 Mahler: Symphonies Nos. 3 and 4
Schoenberg: Gurre-Lieder
- 1902 Debussy: Pelléas et Mélisande
- 1904 Mahler: Symphony No. 5
- 1905 Debussy: La Mer
Mahler: Kindertotenlieder
Schoenberg: Pelleas und Melisande
Scriabin: Symphony No. 3
Strauss: Salome
- 1906 Mahler: Symphony No. 6
Schoenberg: Chamber Symphony
- 1907 Schoenberg: Friede auf Erden
Schoenberg: String Quartet No. 1

Although the list is by no means complete, it points out the highlights of a period characterized by the decline of tonality. The scope of classical tonality had already been extended in works of Beethoven and the early romantics. Novel tonal relations such as the chromatic mediant keys had been used, thus weakening the relationships in the circle of fifths which had previously played a central role in the tonal structure of music.

Indeed, in his discussion of atonality in Music Here and Now, Ernst Krenek asserts that it is the absence of dominant relationships which is almost solely responsible

for the seeming lack of coherence in the atonal idiom.² Increased use of chromaticism as well as more frequent and distant modulations are characteristics which can be found in the music of the early nineteenth century. This trend continued through the last half of the century.

Another noteworthy characteristic which can be noted in the works listed in the chronology is the increasing use of suspended tonality, a result of expanded application of the modulation principle wherein virtually every chord is potentially in a different key; the resulting progressions have little or no tonality. The harmonization of unessential tones with transitory sonorities and the phenomenon of chromatic "slide-slipping" of seventh chords (a technique which resembles the resolution of a German sixth chord to the dominant seventh) are manifestations of the principle of suspending tonality.

A freer use of dissonance grew out of this chromatic idiom. Non-harmonic tones are found clashing in seconds with their resolutions, as shown at the asterisks in Figures 1 and 2. Similar clashes may be the result of substitute function chords--the replacement of a "true" chord by a chord which operates similarly in the particular harmonic context. For example, Strauss' Salome contains the

²Ernst Krenek, Music Here and Now, trans. Barthold Fles (New York: W. W. Norton & Co., 1939), pp. 151-152.

Animando

English Horn

Harmonic Background

Figure 1.--Wagner, "Prelude" to Tristan und Isolde,
mm. 45-46.

Majestoso

Flute

Oboe

Harmonic Background

Figure 2.--Bruckner, Symphony No. 6, m. 16.

chord shown at the asterisk in Figure 3. From context, the dominant ninth shown in Figure 4 is implied. The lower four tones have been replaced by their chromatic neighbors to produce a substitute function chord.³ Ravel terms this practice "the simultaneous use of different modal articulations."⁴ Unresolved dissonances used in this manner still preserve a certain functionality of harmony provided the implication is clear. Says Collaer: ". . . an art of allusion, of reading-between-the-notes, was born with the first measures of Tristan und Isolde . . ."⁵ This technique continued into the early twentieth century. The topic of harmonic allusion will be discussed in greater detail later.

The desire for novelty and sensuality of sound which motivated the use of substitute chords of greater dissonance also motivated the invention of new chords and scale systems through theoretical constructions. Well-known examples of such constructions are the whole-tone scales and chords of Debussy, Schoenberg's chords in fourths and Scriabin's mystic chord.

³Mosco Carner, A Study of Twentieth Century Harmony: A Treatise and Guide for the Student-Composer of Today, 2 vols. (London: Joseph Williams, 1942), 2:32.

⁴Paul Collaer, A History of Modern Music, trans. Sally Abeles (Cleveland and New York: World Publishing Co., 1961), p. 61.

⁵Ibid., p. 60.

Molto Largo



Figure 3.--Strauss, *Salome*, one measure before rehearsal number 361.



Figure 4.--The implied dominant ninth of Figure 3.

The last feature of this period to be mentioned in setting the historical perspective for the following discussion is the increased use of counterpoint. This is especially true in the case of Wagner (Die Meistersinger "Overture") and Schoenberg (String Quartet No. 1). The use of counterpoint is related both to the decline of the formal element of music and to the collapse of tonality. The decline of form began at least as early as Schubert with his "irregular, unsymmetrical periods."⁶ This is, of course, also true of Brahms. Wagner's music dramas, by subordinating music to the dictates of the drama, also abandon elements of form. The use of leitmotifs effects a restoration to unity here. It is probably with Wagner, then, that motivic construction gains importance in light of the historical developments which follow.

The decline of tonality which paralleled the abandonment of the classical forms also led to the rise of contrapuntal techniques. Collaer, paraphrasing Erwin Stein, puts it this way:

To enrich harmony, melody and rhythm were relegated to the background for purposes of maintaining clarity and allowing the ear and brain to perceive complex harmonic treatment. Increasing harmonic instability diminished architectonic possibilities; counterpoint was needed to fill the breach.⁷

⁶Krenek, Music Here and Now, p. 136.

⁷Collaer, Modern Music, p. 70.

Later he adds, ". . . polyphony, more so than harmony, makes the listener grasp the function of the dissonances" ⁸ One of the principles of harmonic progression which will be mentioned again later is related to the use of counterpoint. Carner takes note of it in his A Study of Twentieth Century Harmony: "Another principle is to allow special contrapuntal and thematic designs to dictate the harmonic course. . . ." ⁹

These then are the chief trends in the music of the late nineteenth and early twentieth century: extreme chromaticism, numerous modulations, suspended tonality, freer use of dissonance, substitute-function chords, artificially constructed chord and scale systems, and an increasing interest in contrapuntal techniques. It will be seen that all of these apply to the Berg Piano Sonata, Op. 1.

⁸ Ibid.

⁹ Carner, Twentieth Century Harmony, 2:46.

CHAPTER II
GENERAL DESCRIPTION OF THE SONATA
AND ITS FORM

The plan for the remainder of this paper is first to give a general description of the sonata with an emphasis on form; secondly, to discuss the melody and counterpoint with emphasis on motivic construction and development; and lastly, to treat the subject of harmony and harmonic progression. Wherever relevant, probable origins and influences on techniques used in the sonata will be discussed. A copy of the score can be obtained from Theodore Presser Company.

The sonata is a one-movement work, ostensibly in B minor, whose plan is a clear first-movement form. Exposition (marked with repeat sign), development, and recapitulation are nearly equal in length--56-1/3, 54, and 69-1/3 measures, respectively. The greater length of the recapitulation is the result of extending the closing theme. There is no coda section.

The three main divisions can be subdivided into smaller sections. The exposition presents two theme areas each of which divides itself into two parts. These will be referred to as Ia, Ib, IIa, IIb. In addition to these, a closing

theme (III) is derived from previous material. The development can be subdivided into three sections, the middle of which is the longest and can be further divided into two parts. The development sections will be labelled 1, 2a, 2b, and 3. The recapitulation presents essentially the same material in the same order as the exposition, but with certain extensions and deletions and transposition of most of the second theme area into the tonic key, thus following the standard classic formula.

The key of the sonata is B minor and the two-sharp key signature is used throughout the work. Due to the highly chromatic idiom, however (approximately 99% of the notes have accidentals before them), the pattern of key relationships is difficult to trace. Tonality, while occasionally clear, is alternately ambiguous and vague. As can be expected, the development is the area of greatest tonal instability, being almost entirely "suspended." The opening and closing of the work, in contrast, give the clearest clues to key identification. It is as if the movement were shaped to travel from tonality into atonality and back again. Corresponding to this "journey," the dynamic level of the opening and close is piano and pianissimo, respectively, whereas the development reaches quadruple-forte.

An outline of the sonata with specific measure numbers, thematic material, keys, and dynamic levels is given in Table 1 to assess its overall proportions. Note the

TABLE 1.--Outline of Piano Sonata, Op. 1 by Berg.

Length in Measures	Measures	Themes	Keys	Dynamics
Exposition (0-55)				
11	0-10	Ia	b	p $\leq$ ff $\geq$
6	11-16	Ib	D	pp
12	16-28	Ia, Bridge	-	mf $\leq$ ff $\geq$ mp
9	29-37	IIa	A, e	mp $\leq$ mf $\leq$
11	38-48	IIb	-, b	f $\leq$ ff $\geq$
7	49-55	III	-	pp $\leq$ p
Development (56-110)				
14	56-70	1	-	pp $\leq$ ff $\geq$ pp
8	70-77	2a	-	pp $\leq$ mf $\leq$
22	78-99	2b	-	$\leq$ ffff $\geq$ pp
11	100-110	3	E	pp
Recapitulation (111-179)				
19	111-130	Ia, ext.	(b)	mf $\leq$ ff $\geq$
6	131-136	Ib	(D)	p $\geq$ pp
7	137-143	IIa, contr.	B	p $\leq$
23	144-166	IIb, ext.	-, g	mf $\leq$ fff $\geq$ pp
13	167-179	III	b	pp $\geq$ ppp

alternation between longer sections rising to a high dynamic level and falling off with shorter sections which maintain a rather low dynamic level. This pattern is broken only with the absence of the bridge material in the recapitulation--material deleted in order to balance the extension of material before (Ia) and after (IIb).

By and large, the tempo indications follow the dynamic indications. Thus, the appearance of IIb, always soft, is always marked "Langsamer als Tempo I." Similarly, the term *accelerando* is often found with *crescendo*, whereas *ritardando* is paired with *diminuendo*. Significantly the tessitura usually rises and falls to match these directives. See measures 20-37, 78-97, and 154-164.

Note, also, that the high point of the entire movement occurs in the development (ffff-measure 91), only two measures past the mathematical midpoint of the work. Judged from the point of view of the development area alone, the climax occurs later--two-thirds of the way through. The secondary high point occurs in the recapitulation (fff--measure 157). This is more than five-sixths through the movement and almost three-fourths through the recapitulation. Investigation of the placement of climactic points, both those mentioned and others, reveals a tendency to spend more than half--usually about two-thirds--of a phrase or section in building up to a climax, and the remaining third in tapering off. The consequence of this is that fully twice

as much time is spent in passages of rising tessitura, crescendo, and accelerando as is spent accomplishing the reverse. This explains, in part, the driving, energetic, even passionate quality of the music.

Tension is also created through the use of contrapuntal devices and thick sonorous harmonies. These elements give the impression that the sonata was orchestrally conceived. The counterpoint would become less dense with the use of differing timbres and the harmonies more cogent by appropriate doubling and spacing throughout the orchestra. Musicologist Szabolcsi sheds light on this matter when he states:

The new harmonic realm, which above all was denser, more saturated, and at times sharper, at times more sensuous than the old, was inspired by the orchestra itself. . . . The sounding ideal of the compositions of 1900 was overwhelmingly the sound of the orchestra, "Orchester-klang, even if they were written for piano or chamber music ensembles."¹⁰

The Berg Piano Sonata most assuredly belongs to the piano works referred to here.

With this general picture of the overall proportions and tone of the work in mind, attention will now be focused on the melodic, motivic aspects.

¹⁰Bence Szabolcsi, "The Decline of Romanticism," Studia Musicologica Academiae Scientiarum Hungariae, 12 (1970):278. Emphasis added.

CHAPTER III

MELODY AND MOTIVIC DEVELOPMENT

Melody in the Piano Sonata exhibits several noteworthy characteristics. These include the use of a wide range within single phrases, the use of large intervals, the use of anticipation and appoggiatura figures, the preference for augmented triad outlines over major and minor triad outlines, the use of broken quartal chords (with one of the fourths augmented) and whole-tone scale segments, and the elision and regrouping of motivic fragments to provide the continuity of an "endless" line.

As for the wide range, it is not necessary to look further than the first theme area of the exposition (0-28). The opening phrase spans an octave and the following material to measure 8 spans a perfect fifteenth. An accurate count of the first theme area through measure 28 with regard to range reveals the average phrase to be three measures in length and to span a perfect eleventh (see Appendix A). This means that, on the average, the melodic line travels a distance of a perfect eleventh every three measures.

The use of such a wide range has precedents from Wagner to Schoenberg. An examination of Figures 5-10 should substantiate this point amply.

Langsam und schmachtend



Figure 5.--Wagner, "Prelude" to Tristan und Isolde, mm. 17-21.

Allegro molto con brio



Figure 6.--Strauss, Don Juan, Op. 20, mm. 1-3.

Nicht zu rasch



Figure 7.--Schoenberg, String Quartet No. 1, Op. 7,
mm. 1-6.

Sehr rasch



Figure 8.--Schoenberg, Kammer-symphonie, Op. 9,
rehearsal number 29.

Nicht zu rasch



Figure 9.--Schoenberg, String Quartet No. 1, Op. 7,
mm. 97-99 of rehearsal section A.

Sehr rasch



Figure 10.--Schoenberg, Kammer-symphonie, Op. 9,
rehearsal number 44.

Berg's use of large intervals can be seen in measures 7 (m7, M9), 11 and 14 (P5, m6), 33 and 35 (M6), 39, 42, and 44 (m7) 67 and 68 (M6, A8, P11), 95 and 96 (m7) and in the measures of the recapitulation which correspond to those of the exposition. Illustrations of previous uses of large intervals are found in Figures 5, and 8-10.

It should be noted that while these lend a distinct character to the melody, they are by no means in the majority. In fact, a study of melodic intervals in the upper voice of the sonata reveals just the opposite about large intervals, as well as some other interesting trends. The following paragraphs summarize the findings displayed in Table 2.

Intervals of the minor second both up and down, the major second down, and the unison (repeated note) account for more than half of the intervals occurring in the sonata. These, together with the rising perfect fifth, major thirds both up and down and the ascending minor third all occur a greater number of times than average. By "average" is meant the number of times each interval would occur if all intervals occurred equally often. Averages for intervals including and excluding the element of direction are 27 and 56 occurrences respectively, as shown in Table 2. The tritone (in both directions) occurs only slightly more often than "average." The remaining intervals occur with less than "average" frequency. These include all types of sixths, sevenths, and ninths, perfect fourths and octaves, both ascending and descending, as well as the falling perfect fifth and minor third and the rising major second.

TABLE 2.--Frequencies of Melodic Intervals Occurring in
Piano Sonata, Op. 1 by Berg.

Interval	Direction	Frequency	Total for Both Directions	Directional Preference
Unison	--	--	80	--
m2	up	93		
m2	down	130	223	down
M2	up	8		
M2	down	130	138	down
m3	up	39		
m3	down	6	45	up
M3	up	36		
M3	down	65	101	down
P4	up	23		
P4	down	22	45	none
TT	up	34		
TT	down	30	64	none
P5	up	40		
P5	down	6	46	up
m6	up	15		
m6	down	7	22	up
M6	up	13		
M6	down	9	22	up
m7	up	6		
m7	down	12	18	down
M7	up	12		
M7	down	2	14	up
P8	up	4		
P8	down	6	10	none
m9	up	2		
m9	down	1	3	none
M9	up	2		
M9	down	1	3	none
TOTALS		754	834	
NUMBER OF CATEGORIES		28	15	
AVERAGES (Total Occurrences divided by Number of Categories)		27	56	

Among groups of the same type of interval certain preferences are obvious. The rising major second is hardly used at all (eight occurrences) when compared to other types of second. The falling major and minor seconds occur 130 times each, and the rising minor second occurs 93 times.

Major thirds occur more often descending (65) than ascending (36) but minor thirds occur more often ascending (39) than descending (6). And in general the major third in either direction (101) is preferred to the minor third (45).

No preference is in evidence for the direction of perfect fourths and tritones but tritones do appear slightly more often (64) than perfect fourths (45).

The rising perfect fifth (40) is preferred to the falling (6), and is in fact also found more often than either tritones, fourths, sixths, sevenths, or octaves.

Rising sixths (28) both major and minor are slightly preferred to falling sixths (16). Rising major sevenths (12) occur six times as often as the falling major sevenths which are practically non-existent (2), but the falling minor seventh (12) is preferred to the rising (6).

Octaves occur with rarity and no evidence of directional preference is apparent. Ninths occur even less frequently.

It can be observed from Table 2 that, in general, the smaller the interval, the more frequently it is used. In spite of the low frequency of such intervals as the minor and major sevenths, it is suspected that in comparison with their usage in any classical sonata the frequency of these intervals is actually quite high.

Table 2 also reveals a tendency to use large intervals rising, small intervals falling.

The use of the anticipation figure in the sonata is related to the subject of intervallic structure in that it is a melodic unison--an interval which was included in the study of melodic intervals. The term "melodic unison" is used synonymously with "repeated note" here.

The melodic unison never occurs twice in succession. In other words, three successive attacks of the same pitch could not be found throughout the sonata. It is significant that the stress pattern of the repeated note is treated very exactly. When a tone occurs twice in a row the accent pattern may be one of two: weak-strong or strong-weak. (Only the first of these would be termed an anticipation figure.) In the exposition, occurrences of the former pattern (weak-strong) are found exclusively in the first theme area, whereas the latter arrangement (strong-weak) is found exclusively in the second theme area. Moreover, in both areas, the strong part of the pattern is never shorter in duration than the unstressed

(weak) part. In the first theme area, then, the pattern gives a feeling of forward motion as the melody is impelled by the anticipation figure shown in Figure 11; whereas in the second theme, a holding-back or lingering quality is given by the reversal of the stress pattern shown in Figure 12. An isolated instance or two of these



Figure 11.--Berg, Piano Sonata, Op. 1,
lower voices of m. 6.



Figure 12.--Berg, Piano Sonata, Op. 1,
upper voice of mm. 33-34.

usages would not accomplish the unity achieved by this effect that is claimed here. It must be remembered, therefore, (1) that the melodic unison occurs with much greater than average frequency (only seconds are found more often), and (2) that the same stress pattern is used throughout an entire thematic area. Thus, it is both the frequency and consistency of usage of the repeated note pattern and its accompanying stress patterns that serve to characterize each theme, the first theme emphasizing forward motion, the second displaying a more lingering quality. These thematic characteristics correspond, to the busy first themes and the contrasting lyrical second themes of the classic and early romantic sonatas. For previous uses of the anticipation see Figures 13 and 14. Note the similarity between Figure 14 and measure 6 of the sonata. Figures 5 and 9 previously shown also contain anticipation figures.

Langsam



Figure 13.--Mahler, Symphony No. 3, Mvt. 6,
rehearsal number 10.

Wieder beschleunigend



Figure 14.--Schoenberg, *String Quartet No. 1*, Op. 7,
mm. 50-52 of rehearsal section B.

A similar treatment is found in the use of the appoggiatura figure as was found for the anticipation. (Again, no distinction will be made as to consonance or dissonance. "Appoggiatura" will refer simply to a three-note figure forming a leap and a step in the opposite direction, the middle note being stressed.) Four varieties of appoggiaturas are employed. The leap can be up or down (the step then being down or up respectively) and the "resolution" either with or without anticipation (see Figure 15).

A study of the occurrences of the various types of appoggiaturas again reveals a preference of certain types for certain thematic areas. In the first theme area (Ia, Ib) appoggiaturas of Type I predominate while Type IV is not found at all. In theme area IIa, in contrast, only Type IV is



Figure 15.--Four appoggiatura types.

found. In theme area IIb, Types I and II are again absent but Type III predominates. For detailed tabulation, see Appendix B. These preferences again serve to delineate the formal divisions of the work, each lending its own distinctive, if subtle, influence of the character of each theme area. The upward motion of Types I and III serves to drive the material forward in theme areas Ia, b and IIb, respectively, but the lack of the anticipation in Type III gives a more direct expression to phrases in which it is used. Type IV with its downward leap is reversed for the quieter IIa, thus emphasizing its comparatively less energetic character. This reversal of contour for contrast between themes has its earlier counterparts in the classical period. In Mozart's Sonata in F for piano (K.547a), for example, compare measures 1-4 with measures 32-33; these begin the first and second themes, respectively (see Figure 16).

Allegro



Figure 16.--Mozart, Sonata, K.547a, upper voices of
mm. 1-4 and mm. 32-33.

The next characteristic of melody in the sonata is a rather obvious one: a decided preference for the augmented triad outline and an avoidance of the major and minor types. This same preference, it will be seen later, applies to the harmonic vocabulary. A comparison of usages for these chord types reveals that nearly half of the measures 0-37 (Ia, b and IIa), contain broken augmented triads while only one-sixth of these measures contain major or minor triad outlines. The latter are found in Ib in combination with augmented triads which dominate because of metrical considerations (see measure 11 for example). The remainder of the exposition (IIb) contains neither type since it is mostly step-wise movement. Roughly the same proportions apply to the recapitulation.

Measure 66 contains a minor triad outline--the only representative of the non-augmented type to be found throughout the development. Even here the harmonic rhythm in quarter notes destroys the effect of a true minor triad. In striking contrast, more than two-thirds of the measures 73-87 (basically, sections 2a, b) contain an augmented triad outline.

Quartal chords occur more often vertically than linearly, but even with relatively few instances the trend can be noted to use perfect fourth-chords harmonically and imperfect fourth-chords (wherein at least one-fourth is augmented) melodically. Melodic usage can be found in the opening (incomplete) measure and in measures 5, 18, 20, 21. All these instances are in the soprano voice and of the so-called imperfect variety. In measures 27 and 28, perfect quartal-chord outlines can be found in the bass line. These, while an exception to the general trend, can nevertheless be interpreted as supportive and therefore harmonic in function because of their placement in the lowest voice. The perfect type can be found again at measures 58-59 while the imperfect type occurs frequently throughout measures 110-124, and again at 159-160 and 176-177. In the case of the imperfect quartal chord of three tones, the tendency is to use the perfect fourth below with the upper two tones forming the tritone. This is true in a large majority of instances, but a few

exceptions can be found, as for example, in the bass line of measure 112.

Whole-tone scale segments fall into a similar category as the quartal chord outlines. They are not so frequently used as to pervade the thematic material with their characteristic sound, and they are both used in transition passages more frequently than in the body of the themes. Passages constructed with whole-tone scales occur in measures 7, 23-25, 57, 59-60, 62, 68-69, 78, 90-91, 127.

The last three general characteristics of Berg's melody in the sonata are traceable directly to Schoenberg, who during the few years before the writing of this sonata was producing music with identical characteristics: augmented triads, quartal chords, whole-tone scales. It was during this period that Berg studied under Schoenberg. For purposes of comparison, see Figures 17 and 18 for use of augmented triads, Figures 19 and 20 for quartal chords, Figure 21 for a whole-tone scale passage. Note the similarity between Figure 21 and measures 68-69 of the sonata.

Discussion of the characteristic devices of elision and fragmentation will be included in the following discussion on motivic development.

Sehr langsam



Figure 17.--Schoenberg, Verklaerte Nacht, Op. 4,
m. 15 of rehearsal section K.

Sehr rasch



Figure 18.--Schoenberg, Kammersymphonie, Op. 9,
m. 3 of rehearsal section 1.

Sehr rasch



Figure 19.--Schoenberg, String Quartet No. 1, Op. 7,
m. 43 of rehearsal section C.

Sehr langsam

A musical score for a chamber symphony, featuring multiple staves. The key signature has one flat (B-flat). The tempo marking is 'Sehr langsam'. The score includes parts for Bsn. (Bassoon), B.Clt. (Bass Clarinet), Clt. (Clarinet), Vn.I (Violin I), Vn.II (Violin II), Va. (Viola), and Vc. (Violoncello). The music is characterized by long, sustained notes and complex, rhythmic patterns. The staves are connected by a brace on the left. The score includes dynamic markings such as 'pp' (pianissimo) and '6' (sexta).

Figure 20.--Schoenberg, Kammer-symphonie, Op. 9,
at rehearsal number 78.

Nicht zu rasch



Figure 21.--Schoenberg, String Quartet No. 1, Op. 7,
mm. 63-64.

To facilitate the following discussion, a catalogue of motives is given in Figure 22. Motives retain their identity regardless of transposition.

Motives A through E are found in area Ia, F and G dominate Ib, and H occurs in the bridge material. The second theme makes use of the remaining motives--IIa uses J and K while IIb is constructed entirely of the complex L motive. M and N occur throughout the sonata, but are most often found in combination with motives B and L.

The first phrase of the sonata presents A and B accompanied by M. In (2) C-3 appears both in the alto and in the soprano in augmentation. This anticipation figure often occurs detached from the rest of the C motive, which itself is a condensation of the essential features of the opening phrase. C and D appear in (3-5) with the thirds of N. These thirds are then used with the anticipation figure in (6) to produce a hybrid motive composed of C-3 and N. At the end of (5) C-2 is found. Its last note

The figure displays a catalogue of 14 musical motives, labeled A through N, from Berg's Piano Sonata, Op. 1. The motives are presented in five staves of musical notation. Motives A, B, C, D, E, F, G, H, J, K, L, and M are written in treble clef, while motive N is in bass clef. The notation includes various musical symbols such as notes, rests, and accidentals. Brackets and sub-labels (e.g., C-1, C-2, C-3, E-1, F-1, F-2, F-3, L-1, L-1a, L-1b, L-1c, L-2, L-3, L-4, L-5) are used to identify specific segments or variations of the motives. Motive L features a sixteenth-note triplet in its L-1b segment.

Figure 22.--Catalogue of motives in Berg's Piano Sonata,
Op. 1.

becomes the first note of C-1. In (7) E appears accompanied by N in a whole-tone scale version, rather than the usual chromatic scale version which follows in (8-9). Motive E serves as a transition motive back to the opening material transposed down a major seventh (8-9). It should be noted that the stressed tones of E form the augmented triad which is C-1. C-3 is again used to effect a transition to Ib in (9-10). F then occurs beginning in the third beat of (10). The first three notes of F are C-3 inverted. F-3 is another augmented triad outline--a re-ordered version of C-1. Motive G in (11-12) is begun with the last note of motive F. When F-1 occurs in imitation in the bass (11), G is similarly elided (12) again. G is derived from F, in that it is the inversion of the first four notes of F-1. The first interval (m3) has been altered by a semitone (to M3), however, and the durations lengthened. In (12) N is used to complete the harmonies while (13) contains a brief reference to M in the lower voices. Here F is repeated up a fifth, the last interval expanded (14). F-2 occurs three times in (15), the last interval varying and apparently chosen for harmonic considerations. In (16-18) the opening is found once again with F-2 substituting for A. The substitution of one motive for another which is in some way similar (the last ascending tritone in this case) is a technique often encountered throughout the work. Thus the composer

provides unity by using motives which are similar--similar enough, in fact, to be used as substitutes for one another.

The already-mentioned repetition of the opening (16-18) is accompanied by the chromatic side-slipping of tritones in the two lower voices--an idea derived from the M and N motives. The next repetition is transposed up a fifth (18-20) and the next (20) yet another minor third up. Although the retrograde inversion of the first three notes of F-1 gives the same pattern (up a fifth, up a minor third), it is doubtful that Berg was conscious of such an obscure relationship.

More noteworthy here is a second use of motive substitution. In (18) D substitutes for A in prefacing B, whereas in (16) F-2 substituted. The contour of F-2 (down, up, up) and the rhythm (a triplet) are the essential elements being imitated when D is used subsequently (18). However, the intervallic structure of D is formed by a re-ordering of the pitches of A, thus making D an appropriate substitute for A. Almost immediately (18) C appears in the lower voice. This, too, is related to the appearance of D, as it contains within it an approximate version of D. The second, third, and fourth notes of this motive certainly form the contour of D. Only the first interval (M3) has been changed by a semitone (from P4 in D).

In (20-21) D is found ornamented with turns. C and E, both modified appear in (22). In (23-24) M is introduced to the accompaniment of F with first note shortened. In (25-28) the bridge passage is completed, presenting inversions of F-1, F-2. E (27-28) is found in the upper line, with durations and intervals transformed. Only the basic rhythm and shape make it recognizable. This shape effects a transition to IIa rather gradually since the J motive, which has the same contour, begins the second theme.

The use of J and K intermixed and the absence of other motives of the first theme area provide the contrasting quality of this theme. Only the first instance of K in (30) harkens back to the first theme since it contains the augmented triad. Altered forms of this motive (K) serve to connect IIa to IIb in (37). Here the last two notes of K overlap successive entries of the same motive above.

Theme area IIb is constructed largely of L, which in turn is related to previously used material. It is originally introduced as a canon at the octave. The voice which follows is exact for only a measure (38-39). After L is stated, fragmentation and regrouping of sub-motives provide material for the remainder of the exposition. In (40-41) L appears minus L-3. The omission causes a grouping of L-2 and L-4 which then can

be considered a new motive (L-5) which is immediately repeated in (41-42). L-2 and L-3, then L-2, L-3, and L-4 occur next, each phrase thus extending the musical thought. With (45-46) extension disappears and a condensation occurs with the counterpointing of L-5 (above) against a metrically displaced L-1 (below). Throughout this area, the parallelism of a modified M and N can be identified in the accompaniment patterns (40-42) as well as C-3 (40-42). In (49-55) an augmentation (not strict) of L-1 serves the double function of closing theme and transition passage both to the opening and to the development section. This too, is subject to fragmentation. In (53) L-1b occurs. In (54-55) L-1c, one note shorter, occurs. Each repetition of L-1c brings it closer to A in structure. Comparing L-1b in (53) with L-1c in (54) shows the minor third expanding to a major third. (This change is anticipated by the same figure in the left hand (53) with major third.) Next (54-55) the perfect fifth contracts to a tritone, and lastly the major third expands again to a perfect fourth. Throughout this motivic metamorphosis no rhythmic change is employed since the rhythm of A was present in this motive (L-1b, c) as early as (50). The accompaniment of this passage (49-55) contains the parallel thirds of N and the parallel sevenths (broken) of M (49-50). The broken sevenths may

also be construed as occurrences of L-5 on the downward leaps of E from which L-5 may have been derived. The similarity between L-1 and F should be noted, also, both having the same general contour and some of the same intervals. Similarly, L-3 and H are related.

In Section 1 of the development, the individual motives begin to lose their identity even more than in the exposition. H figures prominently here, but with the durations shortened. The basic shape of H as used in this section can be seen in the upper line of (57). Motive A, too, is used in (57-60) but is distorted by intervallic expansion and contraction as well as by the absence of the characteristic dotted rhythm. It is found mainly in the accompaniment. Isolated instances of L-1b and E (both modified) can also be seen in this section: (61-62), (63-64) for L-1b; (66) for E.

In Section 2a attention is turned to F and its variants. These occur in the lower line in (70), (74), and (76); in the upper line at (75). Approximations to D can be seen in (71-72) in the upper line, and in (73) a diminution of B occurs which becomes an accompanimental figure throughout the remainder of Section 2.

In Section 2b, a submotive of L (L-3) is developed. Simultaneously with this, F continues to undergo development while fragments of the accompanimental figure derived from B fill the space between. In several instances, F

takes as its beginning the rhythmic figure of this accompaniment (81-83), (86-87). L-3 appears always as step-wise motion downward, as originally, but whole- and half-steps are mixed without a pattern. The final uses of this motive in the development (90-91) create the high point of the movement, and here all whole-steps are used. The four-note pattern which occurs repeatedly in the upper voice in (91-96) is related to D, F-2, and L-4, without approaching any of them very specifically. The general contour of continually changing direction relates the pattern to D and F-3. The final leap up a tritone found in this pattern in (94-97) relates it to the same leap in F-2, and the downward leap of a minor seventh relates it to L-4.

The remaining Section 3 deals with J and L-1. Here L-1 is substituted for K in those places where K occurred in the original expository statement of this theme (IIa). In (107-108) the beginning of B appears. This is extended in (109) to provide a bridge into the recapitulation whose first measure, naturally, includes B.

In the treatment of motives, the recapitulation does not differ radically from the exposition and development sections thus far presented. The specific changes employed in the recapitulation are as follows: Measures 111-115 parallel measures 1-5. Measures 116-126 form an extension using the motives A and D and their

transpositions. Two statements of B also occur during this extension at (118) and (122). The motives C and L-3 are developed at (123-126). The whole-tone passage of (127) corresponds to that of (7) in the exposition, while the second part of the main theme occupies (131-136). The return statement of the first part of the main theme and the bridge passage are entirely deleted here and the second theme enters in (137). The first part of the theme is abbreviated; the second, extended. Although the theme is first transposed up a major second from its previous expository statement, its second portion (144) stands in the relationship of a major third to its counterpart at (38). Measures 146-147 parallel (144-145) which hold the basic material for this section. The interval of transposition is alternately a major second and a major third, intervallic structure being variable. The phrase is then fragmented, its last half occurring in sequence at (148-149). Measures 150-154 correspond closely to measures 40-44 of the exposition. Sequential treatment of the last segment of these measures follows. The quartal harmonies of (153) are transposed up a minor third in (155) and development of L-3 continues to and beyond the culmination (157) of the phrase. Measures 165-168 correspond to (47-50) of the exposition.

The A motive is used more often in the recapitulation in an imitative pattern which occurs most often in the bass (110), (112-113), (159-160), but is found in the upper voice at the conclusion of the movement (177). Most of the other motives, because of extension of the material, are also used more often in the recapitulation. H, however, which occurred in the bridge section (now deleted) is only hinted at in (124-126) where, lacking the anticipation figure, it is actually L-3. At (137) a substitution is made for J in IIa. Here the perfect fourth and tritone appear, which are related to A and to D. The contour is like neither of these, however, inasmuch as the general downward-leaping character if J is preserved. From (144) to (161) L, especially submotive L-3 dominates the upper voice while M, N, and L-3 can be found below.

At (157-158) the lower voice contains two instances of L-1b with a one-note extension. These occur with the dotted rhythm of A which follows in (159-160). The closing theme featuring the augmentation of L-1 occurs in (167) above, then in (169) below. In (171) an approximate inversion forms the bass line. This is then fragmented, two occurrences of the augmentation and inversion of L-1b appearing in (173-174). Motive A imitated in successively higher octaves (176-177) rounds out the concluding phrase of the movement.

Summary

Several conclusions can be drawn from this study. First of all, motives are used which are related to one another either intervallically, rhythmically, or by similarity of contour. In this way, motives seem to grow out of one another and a continuous flow is made possible. Another effect of the similarity of motives is the widening of potential for development through the substitution of motives for those which are similar.

Secondly, motives are frequently fragmented into submotives, and regrouped. The juxtaposition of submotives, then regrouped, provides a means of creating new motives.

Thirdly, motives and submotives are frequently varied. This is done both by changing the specific intervallic structure and by changing the rhythm. Variants are sometimes introduced gradually by a process of motivic metamorphosis. Augmentation and diminution are both used in the sonata, as is inversion, but a clear case of retrograde could not be found.

Thus, it can be seen that Berg's treatment of motives is highly complex and subtle, involving the construction of motives by altering or fragmenting those previously stated and also by hybridizing two or more motives--extracting different elements from each to form a new motive. It should be remembered, however, that the

composer was more than likely performing these operations largely intuitively. On the other hand, influenced by Schoenberg's interest in matters of motivic development, neither could the composer have been unaware of these usages in his own music. Stated differently, it is nearly impossible that Berg could have written this sonata by establishing a catalogue of motives and then charting out their subsequent transformations and deployment throughout the movement. Rather, the analysis given here makes use of these devices as means of revealing the subtle, complex workings of Berg's compositional process.

CHAPTER IV

HARMONY

The harmonic aspect of the Piano Sonata will be seen to be no less complex than the melodic aspect, as the harmonic vocabulary reflects the many historical trends already discussed in the perspective. The remainder of this paper is devoted to the harmonic aspect of the sonata. The discussion progresses from the general problem of harmonic ambiguity and a proposed solution to this problem through the topics of dissonance treatment, chord vocabulary, and harmonic progression to conclude with an analysis of the sonata from the harmonic viewpoint.

Harmonic Ambiguity

The first problem encountered in dealing with the subject of harmony in expressionist works of this period is that of harmonic ambiguity. Since many works of approximately 1890-1910 share this characteristic with Berg's opus, attempts directed at solving the problem specific to the Piano Sonata are very likely applicable generally to other works of this style.

By harmonic ambiguity is meant that several possible analyses apply for the large majority of the

sonorities. The ambiguity is one of symbolic analysis, but equally one of aural perception, as the two are intimately related. Ambiguity arises primarily out of the free use of linearly generated dissonances mentioned previously which obscures or alters the underlying harmony. A second type of ambiguity--that of harmonic function--is caused by rapid shifts or absence of tonal center. The two types are interrelated.

Since chord ambiguity is the result of dissonance, chord identification is bound up with dissonance identification. The problem is one of deciding which tones of a sonority are chord tones and which are non-chord tones. This decision is affected by the historical element as follows:

The acceptance of more and more dissonant sonorities as harmonic entities is essentially a historical process. Some theorists refer to this process as "legitimization" of sonorities, or stated differently: dissonances are said to be "frozen" onto an existing chord structure by their continual use together.¹¹ An example of this process is shown in the transition from the late nineteenth century practice of using appoggiaturas together with their resolutions in inner voices to the early twentieth century practice of employing such dissonances unprepared and unresolved--that is, frozen.

¹¹Roger Sessions, Harmonic Practice (New York: Harcourt, Brace and Company, Inc., 1951), p. 224.

By this historical process, what is considered a non-chord tone in one work may be considered a chord tone in a work written at a later date.

Now the question of what does or does not constitute a chord tone within a sonority reduces to the question of which sonorities shall be considered legitimate, that is, capable of standing alone without need of resolution. This problem could easily be solved if an arbitrary decision were made to accept a list of sonorities as legitimate.

Such a solution would be workable were it not for the varied treatment given to sonorities within a single work. The ninth chord, for example, is sometimes used with the ninth unprepared and unresolved; in other instances the ninth is prepared, resolved, or both. In the first case the chord symbol would represent a ninth chord; in the latter case the underlying seventh chord may be a possible analysis with the ninth considered a non-chord tone. For this reason, it is not always appropriate to choose a list of sonorities to be considered legitimate throughout the entire course of a work. Rather, each case must be decided according to its own musical context.

Instead of an inflexible system of classification, then, this paper adopts several guiding principles in dealing with analysis of ambiguous sonorities. These are the principles of voice leading, harmonic implication, and function.

The principle of voice leading can be stated thus: Tones of an ambiguous sonority which move to form an unambiguous sonority may be considered non-harmonic. In other words, the pitches of a sonority may be dissonances which resolve later. The chord may have been formed by voice leading which has not yet reached its goal. Such a linearly generated sonority is non-structural, formed in much the same way as in traditional four-part harmony a "chord" is formed when most or all of the voices contain passing or neighboring tones. This illustrates the danger of construing harmony as a strictly vertical phenomenon. Usually by tracing the paths of the individual lines this danger is overcome. A fairly accurate assessment of what is a chord tone and what a non-harmonic tone in any given sonority is usually arrived at by this method.

The principle of harmonic implication is as follows: When one sonority implies another by virtue of the tendency of one (sometimes several) of its tones to resolve, it is analyzed with the chord symbol which refers to the implied sonority. Furthermore, an indication of the non-harmonic device employed is also given. That the phenomenon of harmonic implication is not unique to the expressionist style can be seen in the following example. Suppose a 4-3 suspension occurs over a root

position C major triad; its third is initially absent. Further, suppose the harmony changes to the A minor chord simultaneously with the resolution of the suspension. In this case the C major triad is never heard, only implied. By the principle of implication, the sonority of the suspension chord is analyzed as C major with a non-chord tone present, even though the pitches C, E, and G never sound together.

The principle of function is this: In an area of partial tonality identification of the essential chord structure implicit within a highly complex sonority may be possible on the basis of its harmonic function. That is, a sonority taken together with those preceding and following it may form a modified version of a traditional harmonic progression such as $ii^{o6}-V-i$ or G^6-V^7-I . When the sonority cannot in any way be interpreted as functional, this principle, naturally, cannot be used as a guide to chord analysis.

It must be confessed that these principles, while they may be based on reasonable assumptions, are nevertheless arbitrary and do not guarantee a unique analysis for every possible sonority. A system which could make such a guarantee, however, would very likely misrepresent the musical style by imposing upon it more order than is actually present.

Treatment of Dissonance

Guided by the principles given above, chord analysis becomes somewhat easier. Chord tones are analyzed together by providing a chord symbol which identifies the sonority they form. What remains is to examine the treatment of non-chord tones. Since these invariably form a dissonance of a second, seventh, ninth, or tritone with some chord tone (not necessarily the bass), the term "dissonance" will be used interchangeably with the term "non-chord tone." It is useful to note some of the various ways in which dissonances are treated in Berg's work. In an effort to focus on these differences, an expanded concept of resolution is necessary.

Under the traditional definition of resolution, many of the dissonances encountered in the Piano Sonata would be considered unresolved. These dissonances are subject to varying treatments, however, and it would be misrepresentative to group them all into the "unresolved" category. For this reason, the four most frequently observed dissonance-resolution patterns are described below:

1. Normal resolution. The dissonance and its resolution occur in the same voice over the same chord and without intervening tones.

2. Displaced resolution. The resolution occurs in a different voice, or in a different octave, or both.

3. Simultaneous resolution. The dissonance and its resolution sound together in different voices. The dissonance can either drop out or resolve in its own voice. If it does neither, the sonority can also be called an added note chord or a frozen note chord.

4. Dissonant resolution. This device occurs with a chord change. It is a resolution which would have been a chord tone of the previous sonority but which is non-harmonic in the new chord, thus necessitating further resolution.

All dissonances which neither fall into one of the previously defined categories nor can be interpreted as some combination of them are classed as "unresolved" or "free" dissonances.

As an illustration of these categories, several examples from Berg's Piano Sonata can be given. In (37), for example, the dissonances resolve normally. The harmonic progression may be analyzed as $g^{\#7}$, E^9 without the third, and e^7 . The upper voice contains three appoggiaturas: $A^{\#}$, $C^{\#}$, $F^{\#}$. The bass contains an appoggiatura (G) and two accented passing tones (F, E^b). The "tenor" has two neighboring tones ($A^{\#}$, $C^{\#}$). All of these resolve normally. However, it can be noted that the large number of non-chord tones and the use of the third inversion of the seventh chords to which they resolve creates a high degree of tension.

An illustration of displaced resolution can be found in (148) in the third beat. Here the harmony is a^{o7} without the third. The soprano D clashing with the sounding E^b is clearly a non-chord tone. A logical resolution (in the traditional sense) could be up a minor second to E^b . Instead, the line leaps down a major seventh; the resolution is displaced. Since the resolution is already sounding together with the dissonance, this particular construction also illustrates simultaneous resolution. Another example of simultaneous resolution can be found in (33). The first beat of this measure contains the non-harmonic $A^\#$ over the E minor harmony. Since the fifth of the E minor triad (B) is present in the sonority, the construction can be thought of as simultaneous resolution.

While (166-167) can be thought of as a succession of whole-tone sonorities, it can also be seen as a succession of dissonant resolutions. Collapsing the rhythm and respelling gives Figure 23. This may be considered the alternation of F^7 and $F^{\#7}$. The $C^\#$ which occurs with F^7 resolves properly to C but simultaneously the harmony changes to $F^{\#7}$ making the resolution dissonant. Now the C must resolve to $C^\#$ which it does, but again the harmony changes back. It is as if the dissonant tones and the underlying harmony were each trying to accommodate



Figure 23.--Scheme of mm. 166-167.

the other but working at cross purposes and always failing. Viewed in this way, the process exemplifies dissonant resolution.

It can be seen from the examples just discussed that this terminology facilitates analysis of non-chord tones by providing "shorthand" names for concepts which would otherwise have to be explained in full every time it became necessary to call attention to the particular way a non-chord tone is treated. For instance, instead of saying that a sonority contains an unresolved dissonance which tends to resolve to a tone already present in the sonority, one may simply speak of a "simultaneous resolution." The additional terminology does not replace standard definitions, nor is it intended to do so. Rather, it merely extends the traditional conceptual framework to provide an alternative way of viewing the process of non-chord tone resolution.

Isolated Sonorities

In spite of the difficulties encountered in determining the constitution of isolated sonorities because of the prevalence of non-harmonic devices in combination with high tension sonorities, it is nevertheless possible to discern various chord preferences the composer has.

The first of these is for the augmented triad. It will be remembered that this preference was also found in the realm of melody. This sonority is one of the most frequently used in the entire work. It appears alone, with added tones, especially in the same whole-tone scale, and imbedded in other frequently occurring sonorities. The latter include augmented eleventh chords (major-minor seventh chord with major ninth and augmented eleventh) where the upper three tones form the augmented triad and the dominant seventh with raised fifth. Typical uses occur in the third beat of (8), in the second beat of (17), and in the second beat of (49).

Other frequently found sonorities can be classified with the augmented triad in that they are also whole-tone constructions. The dominant seventh with raised fifth has been mentioned already. The same chord with fifth lowered forms the whole-tone chord, the French sixth. This occurs in the first beats of (2), (12), (60), and

(66). The dominant ninth without its fifth also forms a whole-tone sonority but this is less frequently used. (See the third beat of (60). The B is a chromatic passing tone.)

More frequent are other forms of the dominant ninth: complete as in the first beat of (29) and the first beat of (42), and without the third as in the third beat of (12) and in the second beat of (37). (F, A[#], C[#] are non-harmonic here.) A ninth chord built on a minor triad and minus the seventh appears briefly in the first beat of (64). Ninth chords of any type are rarely used without the seventh.

The most frequently occurring non-whole-tone chord is the diminished-minor seventh chord. This can be seen in the second beat of (2), the first beat of (19), the third beat of (31), the first beat of (44), the first beats of (88-89), and in numerous other locations. This is the first sonority of the "Prelude" to Tristan und Isolde--a chord which can be said to have infatuated a whole generation of composers (see Figure 24 at the asterisk).

The major-minor seventh chord occurs nearly as frequently as the diminished-minor chord. It is used in a variety of ways: in various inversions, with different types of non-harmonic tones or added tones, and in varying harmonic contexts--as dominant seventh (rare), as a German sixth, or in a series moving downward by half-

Langsam und schmachtend

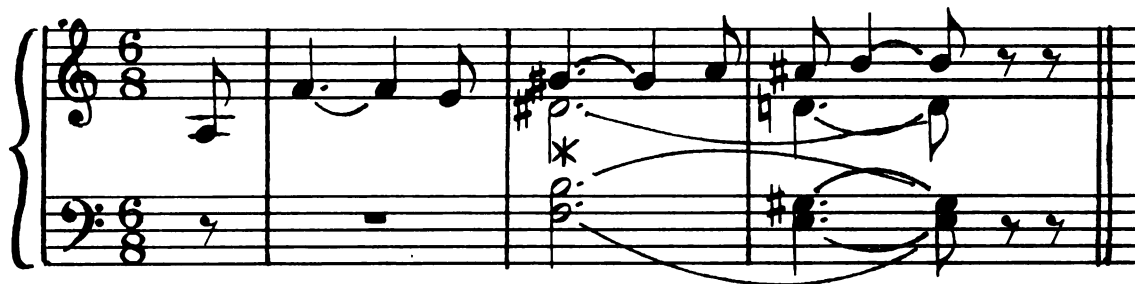


Figure 24.--Wagner, "Prelude" to Tristan und Isolde,
mm. 1-3.

steps. Examples can easily be found. Some of the more interesting uses occur at the third beat of (18) where the seventh is approached by half-step below and the third spelled as a diminished fourth, at the second beat of (38) where numerous non-harmonic tones almost obscure the underlying chord, and at the first and second beats of (104) with a double appoggiatura (D, A). (The last example may be considered a thirteenth chord but the immediate resolution is the factor stressed here in naming it an appoggiatura figure.)

Less frequent are the minor seventh chord, the major seventh chord, and the diminished seventh chord. These can be found at the second beat of (1), the second beat of (12), and the third beat of (14), respectively. Examples of major and minor triads are slightly more numerous than these types of seventh chords, but are

outnumbered by augmented triads, dominant seventh and ninth chords and diminished-minor seventh chords. Diminished triads could not be found.

The sonorities mentioned thus far are dispersed fairly equally throughout the movement. Quartal sonorities, in contrast, are found concentrated in several areas. In (26-27) they underlie the melodic lines; in (43) they are used in parallel motion to thicken the upper line. They occur again in (57-59) and (153-155). These occurrences all feature chords in perfect fourths.

A summary chart for the relative frequencies of various sonorities is given in Table 3. Sonorities which were least ambiguous were chosen to be included in the table; even some of these are subject to various interpretations. Although it is of limited value for these reasons, the table does reveal the composer's general tendencies with regard to chord choice.

Chord Progression

Having now examined the chord vocabulary of the Piano Sonata, the most logical question left unanswered concerns chord progression. The study of how chords move from one to another brings the discussion to the problem of harmonic function and the related problem of tonality versus atonality.

TABLE 3.--Frequencies of Isolated Sonorities Occurring in
Piano Sonata, Op. 1 by Berg.

Tertian		Quartal	
Whole-Tone	Non-Whole Tone		
	Diminished-minor seventh chords	28	
	Major-minor seventh chords	26	
Augmented triads with and without an added tone	21		
	Ninth chords	18	
Augmented-minor seventh chords	17		Perfect quartal chords 17
	Minor triads	12	
French sixth chords	11		
	Major triads	10	
	Eleventh and thirteenth chords	5	
Other types of whole-tone sonorities	<u>13</u>	<u>15</u>	<u> </u>
TOTALS	62	114	17

As already mentioned, the dominant-tonic relation is important in establishing tonality in harmonically-based music. In comparison to the total number of progressions in the Sonata, the dominant-tonic progression is rather infrequent. It can be seen most clearly in (2-3).

The same progression is found elsewhere throughout the work but in modified versions. Since these retain many characteristics of the V-I progression and are thus recognizable as modifications of this formula, they can be thought of as "harmonic allusions" to the simpler "prototype." The allusion is sometimes so obvious that it may seem counterproductive to conceive it as such. But as the modifications become more complex and progressions other than V-I are introduced, the value of extracting the underlying harmonic formulae, called here prototypes, will become apparent.

Several different types of progression may be traced to the V-I prototype. The quality of one or both components may be altered; tones may be added to either chord; dissonant devices may obscure the progression; or non-essential chords may intervene. Moreover, any combination of these modifications can occur together. For example, in (8-9) E and A form the bass. The off-the-beat entries and the extreme separation of spacing is almost enough alone to suggest V-I. On the third beats

of (8) and (9), respectively, the augmented triads on E and A are formed. The intervening material is entirely chromatic voice leading also forming augmented triads, but only on the third beat of (9) does any of these tones coincide with the bass A. Though one may argue at length whether the A^+ chord is heard as a tonic (especially in the light of developments which follow in the next measures), yet it is easy to see that the progression alludes to V-I. (Indeed, it may be that brevity--a certain "fleetingness" of the aural impression--is the essential element of harmonic allusion.)

At (28-29) another illustration of a modified V-I can be shown. Here the dominant augmented-minor seventh chord progresses to a tonic ninth. The tonic ninth on A can, of course, be construed as "pointing" yet farther in the circle of fifths to D. In fact, an augmented triad on D does appear briefly over the pedal A, but the entire phrase is structured around the pitch A. This phenomenon just described--continual harmonic pointings to keys more and more removed, often failing to satisfy the expectation aroused--is practically the cornerstone of the style. At any rate, the frequent use of this technique as found in this work goes a long way in explaining the restless urgency of the music.

While the use of V-I and allusions to it create the most strongly tonal areas (even though brief), other prototypes of a functional nature are alluded to during the course of the movement. These are the deceptive type (V-vi) and the dominant preparation types (IV-V, ii-V, or AUG⁶-V). The modified plagal cadence (IV-I) is also sometimes found. Root progression by thirds is frequent but rarely functional enough to assign a prototype such as I-vi. (An exception can be found in (39) where a definite i⁶-VI is felt in B^b minor.)

Illustrations of the modified deceptive cadence can be found at (18-19) where the progression in B minor is V⁷-vi^{o7} and twice at (160-162) where the progression in G minor is V⁺ --(i, iv passing briefly)--VI-V(7)-VI. The dominant preparation type is seen in (2), second and third beats, where the progression in B minor is iv^{o4}₃-V⁹⁻⁸. On the fourth eighth note of (2), the soprano effects a brief change to vii^{d7}. This tone (C[#]) may also be called an anticipation in this context. In either analysis the dominant preparation prototype holds, as vii^{d7} is also dominant harmony.

From the third beat of (80) through the second of (81) the prototype IV-G⁶-V is alluded to. Here the actual progression is in E^b: IV⁶₅-G⁶-V⁹. The underlying scheme is motivated by chromatic voice leading as shown in Figure 25.



Figure 25.--Scheme of mm. 80-81.

The brief impression of a plagal cadence is given at (175) where the seventh and ninth of the previous dominant chord (E, G) are held over in the form of a double suspension before continuing to the tonic chord.

The harmonic progressions illustrated here are virtually the only types which are clearly recognizable in context as belonging to or pointing to a specific key. Because the allusions to tonality are sometimes brief and occur in a fairly atonal context, however, it is a moot question whether these progressions can be called functional. As with the concept of resolution of dissonance, it is necessary to extend the definition of functional progressions to include these brief harmonic pointings. Otherwise, these areas which are briefly suggestive of a certain tonality must be seen as "out of place" in atonal areas. Perhaps a good term would be "quasi-functional." This helps to illustrate the gradual continuum between the completely tonal and the completely atonal, and the

continual subtle shifting between the two which occurs throughout the sonata.

It should be pointed out here that the atonality found in this work depends not so much on dissonant chord structures as on the absence of functional root movement. A comparison of the sonorities of this work with those of Schoenberg's Three Piano Pieces, Op. 11, written a few years later, reveals the historical trend toward atonality in which not only root movement is non-functional, but isolated sonorities are more dissonant.

The concept of "quasi-functionality" can be appealed to in describing two other types of harmonic usage encountered in the Piano Sonata. The first of these involves the oblique motion found in passages leading to a climactic point. In such passages the upper voice continually returns to a high tone (in comparison with neighboring melodic tones) while the bass--and sometimes the inner voices--moves by step. By providing a continually changing harmonic context for the repeated high note, the motion below creates the illusion of functional harmonic progression. In (41-43), for example, the scheme is as shown in Figure 26.

Interpreted as a minor ninth chord followed by a major ninth chord and a quartal chord, the illusion of functionality is strengthened by the progression from

strong to moderate dissonance. The chromatic root movement precludes true functionality, however. An example of the oblique-motion treatment with the bass moving upward is found at (84-86) where the scheme is as shown in Figure 27.

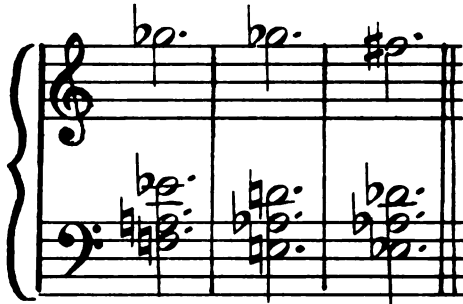


Figure 26.--Scheme of mm. 41-43.



Figure 27.--Scheme of mm. 84-86.

This can be considered a modified iv-vii^{d7}/V-V progression in D minor but key confirmation does not occur. Here again the last chord of the sequence is of more neutral effect (a whole-tone chord) than the more highly

colored sonorities which precede it. Movement toward consonance (less dissonance) seems to be the rule in such passages. Similar passages occur at (89-91), (92-94) and (157-159). All of these instances of oblique-motion treatment occur near climactic points and therefore serve a formal function in that they are used only in a certain context dependent upon considerations of the formal structure of the movement.

Likewise, the use of passages constructed from whole-tone scales, while harmonically non-functional, serves a formal function--namely, that of connection or linkage. These serve in a similar capacity as introductions or endings to certain theme areas. In (7) whole-tone chords lead into the repetition of the opening theme. At (68-70) whole-tone scales appear to close the first section of the development, whereas in (78) they introduce section 2b. Similar use of whole-tone scale sonorities are found in Schoenberg's works, notably the String Quartet, Op. 7. Figure 21 (given in Chapter III) shows the passage that immediately precedes the restatement of the main theme of this quartet.

The placement of certain sonorities or voice leading patterns only in specific formal areas, called here "formal functionality," has its prototype in the cadential action of the common practice period. Certain

types of harmonic progression--certain formulae--were reserved for the pointing out of formal divisions: 1_4^6 -V-I, IV-I, and so on. Although true harmonic functionality is lacking in Berg's work, vestigial traces of formal function such as just described remain.

Not restricted to any formal function is the ever-present parallelism found in this work. Its prototype is the progression of German sixth to dominant seventh or from Neapolitan sixth to second inversion tonic, since these exhibit the chromatic side-slipping so prevalent in the sonata. As used here, however, the progressions are completely non-functional, and do not always involve tertian sonorities. Measure 26 exhibits parallelism of quartal chords, for example.

In the common practice period, a fairly consistent system of root relations motivated the majority of harmonic progressions, but with functional root movement the exception rather than the rule in this work, it is important to determine what other forces or conditions motivate choice of chord progression. Contrapuntal generation of harmony has already been mentioned briefly. To a certain degree, this does apply, but the frequent intervallic distortions of the motives used contrapuntally show that the composer must have considered the resulting harmonies as important as the linear aspect. In some cases he may have considered the harmonic aspect more

important since he was willing to change the intervallic structure of motives to create the desired sonority.

Probably the prime motivation underlying choice of harmonic progressions is the desire for rich, highly chromatic sounds. Applied to isolated sonorities, this explains the prevalence of a wide variety of chord structures and the great number and variety of non-harmonic devices. Applied to the problem at hand--that of chord progression--it explains the prevalence of chromatic voice leading. Virtually every voice not engaged in melodic or contrapuntal activity is moving chromatically throughout the movement. To a great extent, then, harmonic progression is determined by chromatically moving voices. From the third beat of (16) to the first of (18), for example, the upper line has the melody, while the next lower voice has B-B^b-B-A-G[#], the next G-A^b-G-F[#]-F, the next (bass) C[#]-D-C[#]-C-B. Only B-A in the alto is a non-half-step movement. Except for an occasional leap of a third or a less frequent leap of a fifth, the bass line concerns itself mostly with a half-step movement.

In section 1 of the development, this trend can be seen most clearly as the bass does not partake in much contrapuntal elaboration of the main motives here. Starting in (57) the bass descends by half-steps from G to D in (59). On the first beat of (60) the pattern is briefly broken while the bass imitates the triplet pattern

which appeared in the soprano one beat earlier. Then the pattern is resumed with C[#]. The pattern is broken when C moves to F; again when G moves to E in (62), but the remainder of the section to (68) consists only of half-step bass movement.

A study of areas in which the bass is not used in a melodic way reveals that instances of movement by half-step outnumber all other types of bass movement combined. Movement by whole-step is far less frequent and only slightly more frequent than movement by fourth or fifth. Bass movement of thirds and sixths is not at all frequent and tritones are not used in the bass except melodically as at (112-113). For detailed tabulation, see Appendix C. A cursory inspection of the inner voices reveals the same preference for chromatic movement.

The Piano Sonata exhibits features of both tonality and atonality. The dominant-tonic relation is occasionally present but usually modified, as are weaker progressions such as V-vi and ii-V. Certain quasi-functional usages are also found, such as the oblique-motion treatment at points of high tension and the whole-tone scale usages at formal connecting points. Harmonic progression is not only motivated by linear considerations such as contrapuntal treatment, but also by a preference for chromatic voice leading.

Description of the Sonata from the
Harmonic Viewpoint

The previous discussion of the highlights of the style of this work should help in the following description of the sonata from the harmonic viewpoint.

The opening phrase clearly indicates the B minor tonality by the V-i progression which ends it in (2-3). Only in the final measures of this work is the tonal element stronger. The French sixth chord on E or A[#] which begins (2) and changes to a diminished-minor seventh chord on E or A[#] forms a dominant preparation. With E considered the root of the French sixth, the chord becomes a modified subdominant. If A[#] is considered the root of the following chord, the sonority is a leading tone chord. While the chord structures change quickly, the dominant preparation function remains a common element to both.

The opening chord, too, can be seen as a dominant preparation as it is the ii⁰⁷ with an unresolved appoggiatura a fourth (plus an octave) above the bass. This tone would normally resolve down a major second as it does later at (22) third beat, but here it resolves upward by a minor second, thus omitting the third of the chord.

The two remaining chords of the first measure can be seen as passing from the dominant preparation of the first chord to that of the fourth by chromatic voice leading. Both are chiefly harmony as color rather than

as structure, although the B^{+7} on the third beat also serves as quasi-dominant to the E-French sixth which follows. The whole phrase, then can be viewed as a ii^{07} - vii^{d7} -V-i formula, as shown in Figure 28.



Figure 28.--Scheme of mm. 0-3.

The following measures until (8) are largely non-functional harmonically. Whole-tone constructions predominate moving chromatically. E^b is fleetingly tonicized at the beginning of (5) where the E^b minor triad is sounded on the strong beat. The chromatic approach and the parallelism are striking here. The effect is immediately contradicted by the next chord over B, whose dissonance balances the comparative consonance of the E^b -minor triad. The chord is a B^7 with split third and with the fifth entering late in the bass. If it can be assumed that the ear continues to perceive the upper E^b and A into the third beat of this measure (5), the chord formed there

is F^{+7} and the B chord can be seen retrospectively as the result of simultaneous dissonances leading to the F chord. The lower two voices state motives C-1 and D here, too, and thus the sonority on the second beat of (5) can be construed as an instance of a contrapuntally generated sonority.

Though non-functional harmonically, the passage (3-7) serves the formal function of restating in contracted form the material of the first phrase, then linking to a repetition of the first measure in a darker register and at a higher dynamic level.

The melody is reharmonized here (8) and is transposed a major seventh down. The reharmonization which results from the use of parallel major thirds moving chromatically points to the key of A major: The first chord is a whole-tone chord belonging more appropriately with the link-passage it concludes. On the second and third beats of (8) A_4^6 and E^+ are heard over the bass tone E. This bass moves to A for two measures, while non-functional augmented triads move chromatically above. The progression $A_4^6-E^+$ followed by A in the bass can be thought of as an allusion to A major in spite of the non-functional treatment in the upper voices of (9). In (10-11) the implication of movement around the circle of fifths continues as the pedal A moves to D in (11). At the same point the D^7 chord is heard, which in turn implies G. Specifically, G minor is

pointed to by the a^{o7} which occurs at (10) during the first beat. (The E^b is enharmonically spelled $D^\#$.) This measure together with the D^7 which follows can be seen as an elaboration of ii^{o7} -V7 in G minor. Pointing to a key does not establish it, however, and $\underline{D}$ major with both lowered seventh pointing forward to G and raised fourth pointing backward to A is the unusual scale material used during measure 11. The key established here is therefore a modified D major. (It must be remembered that the concept of "establishment of a key" is expanded somewhat in making this statement.) This measure (11), marked "Rascher als Tempo I," opens the second part of the first theme.

The D^7 in (11) expands by means of a broken chord figure into an augmented eleventh chord. The upper voice in (11-12) is imitated at a distance of two beats and an octave and a minor seventh below. The remaining tones are chosen to form as many major thirds and whole-tone structures as possible, given the strict imitation of the outer voices. The dominant ninth on C in (12), third beat and the bass movement down a fifth tends to point harmonically to F major, but the upper voices (13) contradict this tendency. The phrase ends on a whole tone chord on $D^\#$.

Minus one voice, the chord is transposed up a semitone to begin the subsequent phrase. Here it is recognizable as E^{+7} which goes to A^7 in (14). This in turn

expands to A^{11} as with D^7 in (11). The emphasis on A may be considered an allusion to the dominant in the key of D, which is weakly suggested throughout this area (11-16).

Tempo I resumes in (16) with a restatement of the opening theme an octave lower than at first and again reharmonized. The end of (18) reveals the dominant seventh in B minor resolving deceptively in (19) to vi^{o7} . Thus, after some fleeting references to the relative major (D) the suggestion of B minor returns momentarily. In (19-20) the opening occurs a fifth higher as the bridge to the second theme (19-28) is begun.

Tonality is largely suspended during the bridge passage, contrapuntal technique dominating this area. Certain weak allusions to key centers are present here, however. B^b minor, for example, is suggested briefly in (20) by the use of E^b -F-A--the dominant seventh without its fifth--going to B^b - D^b , the tonic (fourth eighth note). This progresses to the vi^6 chord partially enharmonically spelled which can be seen retrospectively as a iv^6 in D^b because of the A^{b7} (V^7 in D^b) which follows. A^{b7} occurs with an appoggiatura D resolving to its third, its fifth entering late in the bass, and an enharmonically spelled seventh ($F^\#$ for G^b).

Although the key of D^b is pointed to, it is never firmly established. In (22) a quartal chord on E, French sixth chord on D^b , and a diminished-minor seventh chord on

C (with appoggiatura F) are found--a non-functional progression with roots descending chromatically. Following this, in (23-26) F[#] minor is alluded to. If the A[#] in the A^{#+} chord over the bass B in (23) is viewed as an appoggiatura whose resolution G[#] is delayed, the sonority implied is ii₅^{o6} in F[#] minor. In (24) the appoggiatura-suspension G[#] follows in similar pattern pointing out the i chord in F[#] minor. The progression is deceptive, however, as it is the VI in F[#] minor which actually occurs on the third beat of (24). In (25) the B minor triad is implied. The inclusion of E for D here gives the effect of a 4-3 suspension though technically the approach and departure make this an accented passing tone. The resolution is delayed while the tones F[#], A[#] (B^b), and C[#] intervene. The B minor triad here can be considered iv in F[#] minor progressing from the previous VI, or, in view of the broken F[#] major triad which is sounded before the third of this triad enters, as i in B minor. A passage dominated by quartal sonorities (26-28) completes the bridge. These move chromatically downward. The outer voices of a perfect quartal triad form a minor seventh, and thus the motive of the chromatically side-slipping minor seventh is found within this succession of quartal chords. The middle tone is omitted on the last of the series in (28) to form with the upper voices E⁺⁷ which progresses

directly into A^9 , the first chord of the second theme. This immediately establishes A as the key of the second theme as well as pointing in typical fashion to a key farther along in the circle of fifths (D). It will be remembered that this procedure has been encountered already in (11). The A major chord is the dominant of the relative major of the key of the first theme (B minor). Although the key relationship is once more removed than could be expected for a work of the previous century, it is quite ordinary for its time and can be considered to be only a slight modification of the tonic-dominant relation of first and second themes of a sonata movement. In the recapitulation, the theme is appropriately transposed to B major.

The first part of the second theme extends from (29) to (37). Augmented triads on D and A appear in the first two measures of this wide ranging melody over a sustained tone A. The A^7 chord in third inversion occurs in (31) and the next phrase suggests E minor since (32) contains the outline of B^9 followed in (33) by the E minor triad with the added non-harmonic tone $A^\sharp$ which resolves both simultaneously and normally to B during the same measure.

In the first beat of (34) is an eleventh chord on C, the lowered sixth scale degree of E minor. The third

of this eleventh chord (E) is absent. The second beat of (34) can be considered a leading tone seventh chord (a minor-major seventh chord); the last beat is B^7 . In this interpretation, the harmonic scheme of (34) is a modified $G^6-vii^0-V^7$. As the third inversion A^7 led to B^9 in (31), so now in (35-36) does a third inversion e^7 lead to $F^{\#9}$ --but with an important difference: Whereas the phrase was allowed to "play out" in the former case, allowing the root B of the B^9 chord to enter late in the measure, in the latter case the phrase continues with more rhythmic energy, squelching an attempt to introduce the root $F^{\#}$ later in the measure. Thus no true $F^{\#9}$ exists there but rather a $\#^07$ which suggests, by its identical voice leading pattern with the previous passage, $F^{\#9}$. Because the second occurrence of this particular voice leading is rhythmically condensed from two measures to two beats, the listener may not immediately hear the parallel structure of the two phrase endings. Yet it cannot be ignored, especially in view of the fact that the second occurrence is transposed a fifth up, showing a vestige of tonal practice.

The phrase continues with a change to the $G^{\#}$ minor triad. Tonality is almost completely suspended here as a flourish of broken chords preceded by appoggiaturas (37) introduces the impassioned second part of the subsidiary

theme. Harmonies change quickly and non-functionally here, simultaneously with highly chromatic lines and many non-harmonic tones.

As the second part of the second theme begins, there is a reference to the foreign key of B^b minor (37-38). The dominant seventh F⁷ is suggested through a forest of non-harmonic tones in the second and third beats of (38). On beat two the entire major-minor seventh chord on F is present--plus the non-harmonic E which resolves to F on the half beat. In the upper voice the sextolet contains the non-harmonic tones F[#] and E. Considering the normal stress pattern for this figure in simple time, neither of these non-chord tones occurs in a metrically strong position. It should be noted also that each of these tones is immediately resolved, albeit abnormally: The F[#] is immediately followed by F in the tenor; the E (of the sextolet) is immediately followed in the same voice by E^b--a chord tone--thus acting as an unaccented appoggiatura. These factors account for the F⁷ interpretation given here.

The memory of this harmony lasts through the measure even though the fifth drops out. The imitation of the sextolet an octave lower also implies that the same harmony is continuing. Against this, in the third beat D^b and G^b occur. The D^b resolves on the half beat to the chord tone C, making D^b an appoggiatura. The G^b resolves

to F in the next measure (39), but on a change of harmony to B^b minor in first inversion--giving the progression V⁷-i⁶. The second beat of (39) gives VI in B^b minor; the third beat, V⁷-IV. Another interpretation is that the second beat forms a pivot chord--a Neapolitan sixth in F minor. This is followed by V and in (40) by the implication of i⁶ in F minor. The last mentioned chord is not actually present, however, as the progression is deceptive: When the dissonances resolve, A^{b7} is found to be the chord substituted for F minor.

The following five measures (40-44) develop this part of the theme through fragmentation of the phrase first presented in (37-39). An allusion to B^b occurs in (41) where a modified V⁷-I in that key is found. Beginning in (40) the accompaniment consists of a series of chromatically side-slipping seventh chords, sometimes modified by suspending the seventh while the root and third first move down a semitone. The series moves from A^{b7} to E⁷ (actually E⁹) with the third G[#] (spelled A^b) now suspended while root and seventh move down a semitone to form a quartal sonority on E^b in (43). At the same time quartal harmony appears in the upper parts moving in a parallel fashion. Tertian harmony resumes with the c^{#o7} chord which begins (44), but a six-tone quartal sonority (all perfect fourths on C[#]) returns to complete the measure

and a four-tone quartal chord on E begins the next measure (45).

Measure 45 and its repetition an octave lower in (46) brings the tonal reference to B minor back again with a modified iv-V progression. The sextolet in the lower voice is formed by a metrical displacement of the sextolet in (38) which began the second part of this theme. The implication of a Phrygian cadence in the outer voice is as shown in Figure 29.

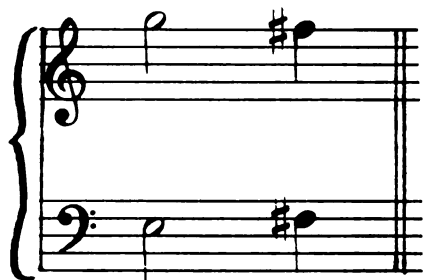


Figure 29.--Scheme of m. 45.

In figure 30 the scheme differs slightly, as it shows the soprano G becoming a suspension. The final beats of (45-46) are harmonized $F^{\#7}$ with no non-chord tones present. The absence of B in the first chord here modifies the description iv-V⁷. However, the effect is similar, despite the quartal-sonority substitution for iv. As for the numerous tones which seem to be left unexplained, note that during the dominant-preparation part of this



Figure 30.--Alternate scheme of m. 45.

progression (i.e., the first two beats) neither $A^\#$ nor $C^\#$ --the tones crucial to the dominant feeling--are sounded, as they would "spoil" the progression through anticipation, whereas fully eight of the ten remaining semitones do appear. ($G^\#$ and B are the only pitches not represented in this measure.) Almost everything that is not part of the dominant is followed by a clear dominant seventh; the feeling of "dominant preparation-ness" is inescapable, especially in connection with the strong voice leading in the outer voices.

The next measure (47) finds the voices interchanged, the sextolet (now delayed a beat) in the upper voice. Whole-tone sonorities can be found here and through the closing theme beginning in (49). A brief French sixth (sixteenth-note duration) ends (47) and in (48-49) the harmony alternates between F^{+7} and $F^\#-Fr^6$.

The closing theme, an augmentation, though not strict, of the sextolet of (45) is accompanied by

chromatically side-slipping augmented dominant seventh chords. These are replaced in (51) by major thirds sliding downward chromatically. At the same point reference to the motive which opened the sonata occurs in the bass. The motivic considerations of the closing passage have already been discussed in Chapter III. It only remains to point out that some rare instances of major triads occur in (53). Also, in (54-55) a sense of urgency is created by the use of the hemiola formula.

The use of tonal references in the development (56-110) is, as mentioned previously, less frequent than elsewhere in this opus. The use of augmented triads and related whole-tone sonorities, of quartal sonorities, and of chromatic side-slippings all serve to obscure the tonality. As seems to be the case in most of the suspended-tonality areas in this work, contrapuntal interest becomes the motivating and cohesive force of composition.

Near the beginning of the development (57), the left hand part consists of the broken chords e^6 , G^b , d^6 , E quartal, E^b quartal--the bass line moving downward chromatically. In the second and third beats of (60), the harmonic implication is $C^{\#7}$, C^7 . The C^7 chord on the third beat is intensified by use of the accented chromatic passing tone B and the ninth of the chord enters last in the measure. Since the fifth of this brief ninth

chord is omitted, the result is a whole-tone sonority. In the next measure (61) the F^7 chord appears also with the B passing dissonance. The tonal reference of C^9-F^7 is then repeated in G minor with D^6-g^7 being the next two harmonies. Measures 62-68 can be seen to have a chromatically descending bass line. The descent here changes to whole-tone movement at the end of this section (69). Above this bass a limited number of chord types occur--diminished-minor seventh chords, French sixths and related whole-tone chords. This passage, lacking a harmonic goal, depends upon the diverging outer voices, the fragmentations of the motive, the increasing density of the texture in the resonant middle range, and the marking "accel. e cresc." to propel it toward its goal in (67). It is interesting to note that the climactic chord occurs when the chromatic bass line reaches $F^\sharp$ --the dominant tone of the sonata. A rapid tapering off concludes the section. The last measure (69) is constructed from the whole-tone scale on C--the upper line being four consecutive whole-tones--the opening motive of this section.

The second part of the development section begins with part two of the main theme--the broken diminished-minor seventh chord with a major ninth on $F^\sharp$ in (70). In (71-72) is a tenuous allusion to A^b major. The highest pitch of the bass in (71) is E^b and this is approached

from the raised fourth D. The continuation of the line leads to the lowest pitch found in (71-73)--A^b. The extremities of the bass line give E^b-A^b. Note also that the sounding of A^b on the third beat of (71) completes the A^b major triad, the E^b and C of which have already been sounding through the second beat.

Similar reasoning in the next measure (72) reveals the important, structural tones in the bass to be E^b-A^b-D^b. The triplet on the second beat rises (so-la-ti-do) to D^b and A^b is present in the upper voice. By the time F enters (last pitch of the bass line), A has intervened to prevent a true major tonic on D^b. Continuing to move in fifths, the next key in this series should be G^b. This is, in fact, the implication in (73). The bass tone D^b is carried throughout the measure to create on the third beat the augmented dominant seventh of G^b. The half beat brings in E^b making the chord a dominant ninth with a raised fifth--a whole-tone chord, incidentally. The dominant function arouses the expectation of a tonic but the satisfaction of this expectation does not arrive: The resolution of the E^b to D^b is delayed and even then occurs with the dominant triad D^b again. Similarly, the D^b drops down but misses the mark by a semitone--dropping to G, which also leaves the expectation unconfirmed. The last beat of (74) and the first of (75) proceed with a

modified half cadence in A^b . The prototype here is $IV-I_4^6-V^7$. The modifications include IV^+ substituted for IV , added raised fifth scale degree (E) to clash with the bass (E^b) of the I_4^6 , and the whole-tone V^9 (omitted fifth) substituting for V^7 .

The two motives treated simultaneously in this section interchange voices throughout (74-76). The D^b augmented triad dominates this passage which concludes this section with a French sixth chord on B , second beat of (77), followed by the already-encountered so-fa-do figure in the bass (77), A major.

Although this completes the phrase, the musical thought flows continuously into the next section. A continual *accelerando e crescendo*, similarity of chord types, and treatment of the same thematic material serve to weld the sections together. However, it can be called a separate section because the material which continues to be developed is treated differently. Moreover, this is the first area of the development in which material from the secondary theme is treated extensively.

The section (2b) is vague harmonically, not only in its lack of tonal reference but also with respect to the individual harmonies. The whole area is contrapuntally conceived and implications of vertical sonorities are at best fleeting.

The first measure (78) of this section is constructed entirely of the whole-tone scale on C. The intimation of G minor pervades the next two measures. Perhaps some would find G minor-major and E diminished-minor seventh chords more suitable explanations for (79) and (80), respectively. An equally suitable analysis would find the contrapuntal element most important with the only harmonic consideration being to de-emphasize occurrences of simple triadic sonorities and dominant seventh chords and to emphasize more strongly advanced tertian sonorities and whole-tone constructions.

The progression in (80-81) has already been mentioned as pointing to E^b : $A^{b7}-B^7-B^{b9}$. This allusion is brief, however, giving way to the B major chord in (82) with appoggiatura C. In (82-83) the following sonorities (not tonalities) are fleetingly implied: D^b , C , a^b , $f^\sharp$, D^7 , and D^+ . The juxtaposition of D^7 and D^+ and g^{o7} in (84) can be construed as quasi-functional because of the root movement.

The harmonies become clearer in (84) and the harmonic rhythm slows to dotted halves. The harmonies are g^{o7} , a^{bd7} , and A^{+7} in the first beats of (84), (85), and (86) respectively. Note also the oblique-motion treatment.

Measures (86-90) form a parallel structure with the preceding phrase (82-86), the upper voice being

transposed up a perfect fourth. The second portion of the structure is extended, the climactic B^b being reiterated a total of four times whereas the F is struck three times. Oblique motion is again present. Diminished-minor sevenths are the predominant sonorities here, beginning measures (88), (89), and (91). Measure (90) contains a minor seventh chord on E but the soprano B^b can be thought of as part of a diminished-minor seventh chord, thus preserving a similarity of chord-type throughout this passage. The same type (diminished-minor seventh) returns again to begin (92) and (94). From (92) to (93) side-slipping seventh chords are found (A^{+7} , A^{b7}).

The tessitura drops from the climactic (92)--quadruple forte--in a passage marked "ritenuto e dimin." The third beat of (94) and the following two measures contain some quartal sonorities. As before, this tonally ambiguous sonority signals a dispersion of tension and the section closes out with the B^9 chord in broken figuration.

The fourth and last section of the development opens with the secondary theme in E. Thus the preceding B^9 effects a harmonically functional connection of the sections. The sextolet figure of (38) reappears here in (101) followed again by the B^9 - E^9 progression. E^{b9} , A^{b7} , and $C^{#7}$ occur in (103), first, third beats, and (104),

first and second beats. Each of these features an appoggiatura figure: A for the E^{b9} , E and B for A^{b7} , and an appoggiatura chord (D minor) for $C^{#7}$. The re-occurrence of the D minor chord in (105) renders it harmonic--part of the B diminished-minor seventh chord. This chord type begins the next two measures--each time a minor third higher-- d^{o7} , f^{o7} . The last of these resolves to the E minor triad in (107). The next three measures serve to usher in the recapitulation. The F diminished-minor seventh chord begins (109) and the sonorities which follow arise out of chromatic movement to accompany the augmented triad motive above.

The recapitulation follows the same order as the exposition in presentation of thematic material. Specific relationships to material in the exposition has been discussed earlier. Harmonically, the recapitulation adds little more to the chord vocabulary. Occasional differences stem from tones of motives which are added to existing material. In (112-113), for example, the upper voices remain essentially the same as in the exposition, while the lower line is involved with the A motive which introduced the recapitulation in (110). The result is more dissonant than its counterpart in the exposition. Diminished-minor seventh chords occur on $D^{#}/E^b$, F, and $G^{#}/A^b$ in the third beat of (115), and in

the first and third beats of (116), respectively. In (118), the statement of the principal theme is thickened with major thirds, but the harmonization is equivalent to that found in the opening of the sonata. Measure (120) begins with E^7 while hints of c , e^b , and a^o follow in the next measure. This area through (126) is mainly contrapuntal in construction. Tonality remains undefined and individual sonorities fleeting or ambiguous. Three measures after E^7 in (120) the A chord occurs (123). The intervening passage destroys the possibility of hearing the implied functionality; nevertheless, a tendency to return to the same area in the circle of fifths even after an area of suspended tonality is revealed to be an essential component of the harmonic conception of the work. These occasional returns serve to constrain and direct an otherwise amorphous harmonic language.

A diminished-minor seventh chord on G in the second eighth note of (124) is followed in (125) by C^7 temporarily pointing to without confirming F minor. The prototype is, of course, $ii^{o7}-V^7$. The C^7 and the chord following in (126)-- c^{o7} --both feature dissonant resolutions. The implication of C^7 occurs in (125) with the passing tone F in the soprano. The resolution of the F is E, which is, in fact, sounded in the soprano on the second eighth note. Simultaneously, however, the harmony C^7 , of

which E is a part, is modified as $G^\sharp$, dissonant to the former sonority, also makes its entrance on the second eighth note in the lower voice. The resolution effect is thus denied the listener after he has been led to expect it--exactly the type of effect which causes many listeners to describe this style as "frustrating." Again in (126), the soprano F resolves dissonantly over the c^{o7} sonority. The expected resolution is E^b ; it occurs, but with the semitone dissonance D.

The next measure of whole-tone sonorities leads to the B minor triad of (128). Augmented triads and diminished-minor seventh chords are implied here. The D7 chord in (131) opens the second part of the theme as it did in the exposition. Various types of seventh and ninth chords, as well as whole-tone sonorities are found throughout the abbreviated statement of this portion of the theme. Root movement in fifths links this section to the statement of the second theme in (137). Thus, the second and third beats of (136) contain $C^{\sharp9}$ respelled D^{b9} and $F^{\sharp+7}$ while the following measure begins the second theme with B^9 .

The sonorities are here again altered from those of the exposition only by the inclusion of more contrapuntal interest. Expository material of (33-36) is deleted. Harmony from the last eighth note of (140) to the second eighth note of (142) is essentially the B minor

triad. A and G in the bass of (141) can be thought of as passing tones, although they do form a minor seventh chord and a major seventh chord, respectively. The E of the last beat of (141) can be thought of as an appoggiatura as it resolves to the chord member $F^\#$ in the second eighth note of (142), although it, too, forms with its surroundings a minor seventh chord.

The b_4^6 formed in (142) then passes to e^{o7} with appoggiatura A in the broken chord figure of the upper line, and then to D minor, implication of which is contained throughout (143). This moves by fifth to an eleventh chord on G, spaced in such a way that the F major triad is prominent in the inner voices. The third (B) is omitted from the chord. The prominence of F major lends a feeling of functionality to the progression to the minor-major seventh chord on B^b in the second beat of (144). The progression corresponds to that found in the first and second beats of (34). The following measure (145) with its D minor implication corresponds to (39) transposed up a major third. The B^7 with double appoggiatura C and E occurring on the third beat of this measure prepares the way for the E minor triad of (146). The intervening f^{o7} of the first beat, however, interpreted as ii^{o6}_5 introduces retrogressive root movement $V^7-ii^{o6}_5-i$ and the result is only a weak establishment of tonality. Although the root

movement is in fifths, the progression $F^{\#4}_3 - b^{o7}$ (no third) found in (147) cannot be considered a tonal reference. In this analysis the E of the upper voice, third beat of (147) is an appoggiatura with displaced resolution. The b^{o7} chord serves as leading tone chord to the C^7 which follows in the first beat of (148). This, in turn, progresses in the third beat of (148) to a^{o7} . It can be noted that (148) forms a sequence with the previous (147) melodically and, to some degree, harmonically.

While melodic sequence continues in (149), the harmonic background changes. An appoggiatura D over c^{o7} occurs initially and in the third beat is found a quartal chord over A. An alternate analysis is possible for the quartal sonority: The harmony may be thought of as a dominant seventh chord on D (in second inversion). The G is then a chromatic upper neighbor to the $F^{\#}$ (spelled G^b here), and the F may be construed either as an added tone with displaced resolution or as the minor third of a chord with a split third. However, since the F continues to sound through its resolution below, and since the resolution itself lasts but a sixteenth-note duration, the over-all effect is that of a non-functional quartal sonority. Yet another element of this chord should be noted. The bass A forms a minor seventh with the G which then moves chromatically downward to the minor seventh $A^b - G^b$ and so

on throughout the next four measures (150-153) whose counterparts are measures (40-43) in the exposition. Note also that again in (153) and (155) the minor seventh occurs in the context of a quartal sonority.

In a passage resembling the climactic measures 88-92 of the development, the scale-segment motive (L-3) is stridently repeated (triple forte) throughout (155-159). While the harmonic background is non-functional in the sense of dominant-tonic relationships, it does function in the sense of providing a changing harmonic context for the repeated high D of the scale motive. The structural bass line again moves obliquely to the D: $F^\sharp$, E, E^b , D in (155-158)--a device already encountered in the development. The specific chords of these measures are $F^\sharp$ -quartal, e^{o7} , c^6 , d^{o7} . The occurrence of the motive in (159) is accompanied with an extremely dissonant construction which can be described variously as (1) an augmented triad on D over a fully diminished seventh chord on A, (2) an eleventh chord on A with triad and seventh diminished, ninth minor, eleventh perfect, or (3) a C diminished-minor seventh chord with appoggiatura D above and pedal A below.

Extreme dissonance gives way to strong tonal references which extend through the final bars. Over the bass G which forms the first note of the three-note opening motive (A) stated here (159-160) the V^{+7} of G

minor is implied. The B^b may be considered a passing tone. It is this tone which reveals the minor mode of the key of G. Deceptive progressions abound throughout (161-164). After the V⁺⁷ of (160) an appropriate Roman numeral analysis for the following four measures would be as shown in Figure 31.



Figure 31.--Roman numeral analysis of mm. 161-164.

Although the B minor tonality is pointed to in (165), confirmation does not occur until (169). Measure (165) ends in a French sixth on E while (166) contains all whole-tone sonorities. Measures (167-170) carry the closing theme first in the highest voice, then transposed a tritone, in the lowest voice. The tritone relation is a modification of the usual F[#]-B perfect fifth relation in B minor as the ultimate goal of the passage is in no way obscured. In (167-168), a French sixth on F[#] is followed by a series of augmented-minor seventh chords--all whole-tone sonorities. The chromatic side-slipping of the sevenths is prominent in the bass line because of the chord spacing. The last seventh chord (on D^b) goes to A[#]--

the leading tone of B minor. The leading tone is resolved to B in the next beat--an unmistakable tonal function is in operation here. It must be noted, however, that while in one octave the A[#] proceeds directly to its goal, in the lowest octave the pitch C intervenes. This is of importance for several reasons. First of all, it creates the interval of an augmented sixth which is enharmonic with a major seventh--in fact the major seventh which would have been the next in the series of chromatic side-slippings. Thus it creates continuity with what precedes. Secondly, the resolution of the augmented sixth outward provides further impetus toward B--both A[#] and C now moving by half-steps to this goal. Moreover, the C, by its strong association with A[#], the leading tone, now possesses the function of a second, upper leading tone to B. This is further substantiated by the use of A[#] and C together again in the last beats of (170) and (172)--both deceptive progressions to B--and in an "authentic" cadence (174-175). The pairing of the two pitches so successfully imparts the function of "leading-toneness" to the pitch C, that the last five measures use the upper leading tone C exclusively with no loss of strength to the feeling of the tonality of B minor.

Harmonically the last passage (169-175) can be described as follows: At the second beat of (169) the tonic is found with passing tone C[#]. On the last eighth

of (169) D^7 in first inversion occurs. At the beginning of (170) is a major seventh chord on C. The $A^\sharp$ of the third beat of (170) gives a German sixth on the lowered second scale degree in B minor. In (171) the resolution occurs but with a seventh in the bass making the sonority b_2^4 . The seventh resolves normally downward to the root of the $g^{\sharp o7}$ chord. The soprano ($C^\sharp$) is non-harmonic here. This, in fact, is the same chord (transposed) which opened the sonata. Another interpretation is that the chord is a passing chord to the D^7 on the third beat: The soprano $C^\sharp$ is then a chromatic neighbor to the C, while the bass $G^\sharp$, is a chromatic neighbor to an implied A in the following beat. The inner voices remain constant. The dominant seventh chord on D progresses functionally to the G major chord (with fifth D only implied). On the second eighth note of (172) it becomes apparent that deception is involved here as G and B are quickly discovered to be seventh and ninth, respectively, of the dominant ninth chord on A. The third beat of (172) brings in the German sixth on C again--and once more the resolution is deceptive as the augmented triad on B is sounded in the upper voices against C in the bass. By the second beat of (173) all but the third of D^{13} (a dominant thirteenth in G major but for the minor ninth E^b) have occurred. In the third beat of (173) and the first beat of (174) $a^{o7}-c^{\sharp o7}$ appear. The first of these functions as a preparation of a dominant

preparation. That is, it is essentially a $\text{vii}^{\text{d}7}/\text{ii}$ (which would be $\text{B}^{\#}-\text{D}^{\#}-\text{F}^{\#}-\text{A}$) except for respelling and raising the fifth a semitone (to give $\text{C}-\text{E}^{\text{b}}-\text{G}-\text{A}$). The use of G for $\text{F}^{\#}$ here anticipates the G of the following chord-- $\text{ii}^{\text{o}6}_5$ --in (174) but it is more likely that a desire to use G to effect a smooth chord connection is outweighed by a desire to avoid $\text{F}^{\#}$ so as not to spoil the final cadence in (174-175). Indeed, the tone $\text{F}^{\#}$ is not used for a span of nearly three measures (172-174). Even in (173) where it is implied in the D^{13} chord it is not actually sounded.

In (174), then, after the $\text{ii}^{\text{o}6}_5$, a French sixth on the lowered sixth (third inversion) and a dominant ninth with lowered fifth precede the long-anticipated tonic. The V^9 , it should be pointed out, is formed by the addition of the pitch $\text{F}^{\#}$ below the German sixth on C found previously in a similar harmonic context (170-171). Totally in character with the previous harmonic treatment of this passage, the tonic triad is actually delayed an eighth note by the suspension of the seventh and ninth of the previous chord, thus giving the briefest allusion to a plagal cadence iv-i. Not only the comparative brevity of duration but also the overpowering functionality and greater density of the preceding V^9 prevent the feeling of a true plagal cadence. A remarkably similar cadence is

found in Mahler's "Nicht Wiedersehen!" from Des Knaben Wunderhorn (see Figure 32).



Figure 32.--Mahler, "Nicht Wiedersehen," final cadence.

Note also the bass movement on the main beats in (172-175).

Stepwise movement predominates until the final cadence.

Figure 33 shows the movement condensed into a single octave.



Figure 33.--Scheme of bass movement, mm. 172-175.

The final cadence is repeated, and an arch-shaped phrase rising with the opening motive over a sustained F[#], then descending on tones of the B minor triad, concludes the work.

Summary

The present chapter deals with the topic of harmony in Berg's Piano Sonata. The opening discussion is on harmonic ambiguity and the analytical problems it presents. Principles which take context into account are employed as a practical solution to the problem of chord identification. Dissonance resolution patterns are treated next. Such patterns which occur regularly in the sonata are isolated and defined, and examples are given. With regard to isolated sonorities, a preference for diminished-minor and major-minor seventh chords, as well as for augmented triads, can be noted.

The topics of harmonic allusion, quasi-functional, and non-functional devices are then treated. The process of alluding to a functional progression by retaining only its essential characteristics is found to be common throughout the work. Certain types of voice leading ("oblique-motion treatment") and certain types of sonorities (whole-tone scales) are found only in certain areas of the sonata. These are called formally--not harmonically--functional. A suggested term for these and similar types of harmonic usage is "quasi-functional."

Non-functional chromatic side-slipping and chromatic voice leading in general are the last topics. It seems reasonable to conclude that a preference for

half-step movement in the bass governs many of the harmonic progressions in the sonata.

A concluding section brings all the previously discussed topics into play including a description of the sonata with respect to harmony.

CHAPTER V

SUMMARY

The discussion of Berg's Piano Sonata, Op. 1, undertaken in this paper consists of four main chapters: Biographical Sketch and Historical Setting, General Characteristics of the Sonata and its Form, Melody and Motivic Development, and Harmony.

The first of these parts serves to place the composer and his work in historical perspective. (The general tendencies found in music of the late nineteenth century are increased use of chromaticism, frequent modulations, and suspended tonality. Whole-tone constructions and quartal sonorities also appear in this period. These tendencies can be traced in works from Wagner through Schoenberg; the usages are likewise employed in the Piano Sonata.)

In the second chapter, the general characteristics of the sonata are described. Formally, the one-movement work in B minor corresponds rather closely to the first movement sonata form of the classical sonata. Two themes of contrasting character are found in the exposition, the first in B minor, the second in A major.

The closing theme is formed from the material of the second theme. The development section, sub-divided into three distinct sub-sections, is the least tonal in the sonata. The recapitulation presents thematic material in the same order as the exposition. Here, however, extensions and deletions are found. Also, the second theme occurs on the tonic level (in B major) in the recapitulation.

It can be noted that the sonata consists of shorter, quieter sections alternating with longer, louder sections. Also, areas of rising tessitura are usually marked "crescendo ed accelerando." The over-all effect of this is a work of high intensity.

The third chapter deals with the subjects of melody and motivic development. The use of wide melodic range has precedents from Wagner to Schoenberg. A study of intervals of the melodic line reveals two distinct trends. The first of these is that the smaller the interval, the more frequently it is used. The second is that large intervals tend to be used ascending, small intervals descending. A comparison of the use of appoggiaturas and anticipations in the first and second theme areas of the exposition reveals a difference in usage dependent upon the theme area. For example, in the first theme area appoggiaturas which ascend and whose resolutions are

anticipated predominate, whereas descending appoggiaturas without anticipations are not found at all. Conversely, in the second theme area, only descending appoggiaturas lacking anticipations are found.

A decided preference for the augmented triad outline in the melodic line is in evidence, as well as a weaker tendency to use quartal chord outlines melodically. Whole-tone passages can also be found, but these are used in transition material more frequently than in the body of the themes.

An analysis of the sonata from the viewpoint of motivic construction and development permits several conclusions. One of these is that the composer chooses motives which are related to one another either intervallically, rhythmically, or by similarity of contour.) Moreover, similar motives are frequently substituted for each other. Another device encountered is that of fragmentation; motives may be divided into submotives and regrouped to form new motives. Lastly, instances of motivic metamorphosis are found. By this technique the specific intervallic structure and the rhythm may be changed successively rather than simultaneously. Variants of a motive are introduced gradually by this method.

The chapter dealing with harmony is itself subdivided into several sections: Harmonic Ambiguity,

Treatment of Dissonance, Isolated Sonorities, Chord Progression, and Description of the Sonata from the Harmonic Viewpoint.

Harmonic ambiguity, as found in many works of approximately 1890-1910 as well as in Berg's Piano Sonata, arises out of the freer use of dissonance characteristic of much of the music of this period. Although the harmonic ambiguity of the style makes chord identification difficult, several principles are adopted to overcome this problem, namely, the principles of voice leading, harmonic implication, and function. The principles are somewhat arbitrary, it must be admitted, and must be used with some degree of subjectivity. Nevertheless, it must be remembered that in a style which is characteristically ambiguous, care must be taken not to impose more order than is actually present, and by so doing, give faulty analysis by misrepresenting the music. The principles adopted in this paper, therefore, appear to be a practical solution to the problem of harmonic ambiguity.

Regarding the treatment of dissonance, the concept of resolution is expanded to include the dissonance-resolution patterns more frequently encountered in the sonata. These provide "shorthand" names for concepts to avoid repetitive explanations later in the paper. Examples from the Piano Sonata are given to illustrate the use of the terms.

A study of isolated sonorities reveals seventh chords of the diminished-minor and major-minor varieties to be most frequent, with augmented triads next most frequent. Ninth chords, augmented-minor seventh chords, and perfect quartal chords also occur with high frequency. Of these, all are found dispersed fairly evenly throughout the sonata with the exception of the quartal sonorities, which are found concentrated in several areas.

The topic of chord progression begins with a discussion of the concept of "harmonic allusion." Many of the progressions found in Berg's opus can be analyzed as modifications of a simpler prototype found in earlier music. Such progressions are termed "allusions." Prototypes most often occurring throughout the course of the work are V-I, V-vi, IV-V, and, less often, IV-I.

Consideration is given to chord progressions, which, while not reducible to some prototype, nevertheless seem to be functional. Typical of such cases is the oblique-motion treatment found near climactic points of the movement. In these "quasi-functional" cases, a repeated note is placed in a continually changing harmonic context, thereby creating the illusion of a functional harmonic progression. This illusion is strengthened by a movement toward consonance as the passage proceeds. Since this type of progression occurs only at specific formal points during the course of the work, it may be called "formally

functional." Whole-tone passages, too, exemplify formal functionality, as they occur only as links and bridges between non-whole-tone material.

A desire for highly chromatic sounds is likely the chief motivation underlying the composer's choice of chord progressions. Except when voices are engaged in melodic or contrapuntal activity, movement by half-step predominates. This trend is demonstrated in a study of the bass line throughout the sonata, which reveals that instances of movement by half-step outnumber all other types of bass movement combined.

The topics of harmonic ambiguity, dissonance treatment, isolated sonorities, and chord progression having been discussed, a description of the Piano Sonata from the harmonic viewpoint follows. All of the topics in the final chapter are thus brought into focus by applying them simultaneously in the analysis of the entire sonata. The analysis section concludes the paper.

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APPENDICES

APPENDIX A

TABLE A1.--A study of range and phrase length in measures 0-28, Piano Sonata, Op. 1, by Alban Berg.

Phrase	Measures Occupied	Length in Measures	Range by Interval	Range in Semitones
1	0-3	3	P8	12
2	3-7	4	P12	19
3	8-10	3	m6	8
4	11-13	3	M13	21
5	13-14	1	M14	23
6	15-16	2	M7	11
7	16-18	2	m10	15
8	18-20	2	A11	18
9	20-22	2	P11	17
10	22-25	3	m10	15
11	25-28	4	M16	26
TOTALS:	11 phrases 29 measures 185 semitones			
AVERAGES:	29 ÷ 11 ≈ 3 measures 185 ÷ 11 ≈ 17 semitones			

From these observations it can be concluded that in the first theme area (measures 0-28), the average phrase length is slightly less than 3 measures and the average range of a phrase is 17 semitones, or a perfect eleventh.

APPENDIX B

TABLE A2.--A study of the appoggiatura figure in measures
0-55, Piano Sonata, Op. 1, by Alban Berg.

Type	Description	Occurrences in Areas Ia, Ib	Occurrences in Area IIa	Occurrences in Area IIb
I	Leap upward, resolution anticipated	4	0	0
II	Leap downward, resolution anticipated	1	0	0
III	Leap upward, no anticipation	3	0	10
IV	Leap downward, no anticipation	0	4	1

APPENDIX C

TABLE A3.--A study of non-melodic* bass movement in Piano Sonata, Op. 1, by Alban Berg.

Type of Movement	Occurrences
m2, M7	156
M2, m7	27
P4, P5	22
m3, M3, m6, M6	12
Tritone	0

* Since the focus of attention is on bass movement as it applies to harmonic progression, instances in which the bass serves a melodic function (such as in contrapuntal imitation) are deliberately excluded.

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