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The Principles of Orchestration

Analysis, Theory and Practice

Master's thesis in Musicology

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Preface

This Master thesis finishes my music studies, which I have carried out at grown-up age. The studies have taken place over the years 2005-2012, both as full-time and part-time studies.

My sincere thanks to:

- My Master thesis supervisor, Professor Ståle Kleiberg at The Department of Music, NTNU, for guidance into the art and science of orchestration, and for patience along the way until this subject was decided upon.
- Other teachers, administrative staff, and, not least, fellow students, at The Department of Music, both at the Music Performance Section in Olavshallen and at the Musicology Section at Dragvoll during the years 2005-2012, for making my music and pedagogics studies the pleasure I hoped it might be.
- Colleagues and staff at SINTEF Petroleum Research, for granting me employment and practical conditions such that part-time music studies were feasible.
- My wife, Kjellaug, for practical and financial care during my study years, and, not least, for supporting my decision to fulfil an old dream.

Purpose of study

This thesis, which concludes my Master study at the Norwegian University of Science and Technology (NTNU), considers the art and science of orchestration.

My aim with this study is to learn the fundamental principles of orchestration through three approaches:

- Theoretical study of textbooks.
- Analyses and comparison of the orchestration of selected historical compositions.
- Application of knowledge, through the orchestration of selected piano composition(s).

The analytical studies, i. e., the textbook studies and the analysis of existing compositions, will give knowledge and tools necessary for the third task: the actual orchestration of a piano work.

For the study of orchestration in existing compositions, I have selected three works, from the classical, romantic, and modern periods:

- W. A. Mozart: Symphony 40, 1st movement.
- B. Smetana: Vltava.
- B. Bartok: Concerto for orchestra, 4th movement.

For my own attempts in orchestration, I have selected four movements from Schumann's piano composition Kreisleriana.

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1. Introduction

1.1 Why orchestration as subject?

Classical music has been a passionate hobby of mine for most of my life. After having devoted a number of years to this hobby at adult age, in terms of university studies, I felt that I had covered a fair amount of the subject, with respect to both the theoretical and the creative sides. Of course, one can never hope to exhaust such a subject – which is also a reason why the passion lasts.

Among the many music subjects were also courses on composition. There are certainly aspects and rules of this activity that can be taught, studied, and learned. However, since there are no definite answers or ultimate solutions in music, the term “rule” may appear to be very strict; I have found it useful to think of such “rules” as principles that one may comply with or not, depending on whether one wants to adhere to the style that the principles actually define.

Through my studies, I have encountered that there are in particular three areas where principles about what is good and what is bad can be formulated: harmony, counterpoint, and orchestration. Having learnt a fair amount on harmony and counterpoint in earlier courses, I found it interesting, challenging, and rewarding to investigate the third topic. Thus, it was natural that orchestration became the subject of my Master thesis.

1.2 Method

My approach to learning orchestration is both analytical, theoretical and practical, as indicated by this three-step approach:

- Literature study.
- Analysis of existing works, from different historical / stylistic epochs.
- "Learning by doing"; transcription of a piano composition for full orchestra.

1.3 Overview of thesis structure

Chapter 2 presents results from the literature study. This comprises, in Section 2.1, the definition of orchestration, criteria for good (or bad) orchestration, and a review of the skills and knowledge that the orchestrator should be armed with. An overview of instruments, the historical development of the orchestra, and musical textures is presented in Section 2.2. Finally, Section 2.3 reviews some of the challenges that face the orchestrator when he/she is to transcribe a piano composition for orchestra.

Chapter 3 deals with three selected orchestral movements from various stylistic epochs: Mozart's Symphony no. 40 (1st movement), Smetana's Vltava, and Bartok's Concerto for orchestra (4th movement). The orchestrations of these pieces are analyzed and compared.

Chapter 4 presents my own attempts in orchestration. Four movements from Schumann's piano suite Kreisleriana are considered, and I describe my approach to these compositions, some of the challenges I have met, and how I have tried to resolve them.

My orchestral scores of the Kreisleriana movements are enclosed in Appendices A-D.

2. *Theory*

2.1 The concept of orchestration

2.1.1 *Definition of orchestration*

According to the *Oxford Dictionary of Musical Terms* (Latham, 2004), orchestration is:

"The art of combining instruments and their sounds in composing for the orchestra, or, more simply and practically, the act of scoring a sketch or an existing work for orchestral forces."

This is a practical and useful definition which hardly needs any further explanation.

The same view is shared by Walter Piston in the foreword to his book *Orchestration* (Piston, 1955, p. vii): "Orchestration [...] refers to the process of writing music for the orchestra [...]", and by Kennan & Grantham (2002, p. 1): "... orchestration has to do with the actual process of scoring music for orchestra".

An essential element in all these definitions, is that orchestration is the practical task of arranging a composition for orchestral forces. Thus, it is not some theoretical "knowledge about", although various pieces of knowledge certainly are necessary in the process, but the actual "doing".

Related terms are "instrumentation", "transcription", and "arrangement" (for orchestra). Compared to "orchestration", these terms may have other connotations of handicraft vs. art, adapting an existing work vs. creating a new piece, small vs. large ensemble, and so on. However, for the purpose of this study, such distinctions are of negligible interest. I shall use the term "orchestration" throughout, in the meaning conveyed by the above definitions.

I have restricted my study to the scoring for symphony orchestra alone, i.e., scoring for vocal or instrumental soloists or groups together with the orchestra is not covered.

2.1.2 *What is good orchestration?*

Piston states what qualities the orchestrator should aim for (Piston, 1955, p. 462):

- Clarity
- Naturalness
- Beauty of sound
- Fidelity to the original musical thought
- Imaginative scoring of renewing interest

- The orchestration should have its origin in the musical material

Piston further warns that "[the orchestration] should not be composed of admired sound combinations copied from the works of others. Formulas and "devices" are the death of creative orchestration." (ibid, p. 462).

This opinion is shared by Jacob (1982, p. 2): "The object of orchestration is not to show how clever one is - that is of no interest to anyone - but to present the music in its clearest and most appropriate orchestral form."

As can be noticed, both Piston and Jacob stress that the orchestration should serve to clarify the music. This view is supported by Adler (2002, p. 547): "One of the major functions of the orchestration of an extended work is to help clarify the form of the entire piece."

The following list by Jacob (1982, pp. 94-95) gives rather detailed advice as to what is good orchestration practice:

- Avoid the 'sectional' effect produced by constantly using contrasted groups of instruments in turn.
- Avoid thickness (caused by too low and 'grumpy' placing of the harmony, or by the desire to give instruments something to do).
- Avoid thinness (too wide spaces between the bass and the next part).
- Do not regard the brass and drums solely as noise-makers.
- Do not keep your horns going all the time.
- Reserve extreme high notes on woodwind and brass for fff climaxes.
- Remember that the strings are the foundation of the orchestra, and do not be afraid to use them alone for quite long passages [...] In quiet passages use 'divisi' rather than double-stops. [...] Make sure that they [i. e., double-stops] are easy to play.

The two groups of people that are the ultimate judges of the orchestrator's achievements, the musicians and the audience, have so far only been implicitly assumed. With respect to the former of these groups, Rimsky-Korsakov (1964, p. 3) emphasizes: "Orchestral writing should be easy to play." Furthermore, he quotes Glazounov, who describes three classes of "excellence in scoring" (ibid, p. 3):

- 1. When the orchestra sounds well, plays from sight; magnificent, after a few rehearsals.*
 - 2. When effects cannot be brought off except with the greatest care and attention on the part of the conductor and the players.*
 - 3. When the orchestra never sounds well.*
- Evidently the chief aim in orchestration is to obtain the first of these results."*

There is more to this statement than merely a classification into good, bad, and ugly orchestration; it points out that, in the end, it is the sounding result that matters.

I will end this section with a quotation by Bernard Rogers (1970, p. 143), which seems to summarize most of the qualities that the orchestrator should aim for.

Although written in the context of arranging/transcription, this statement is definitely relevant to orchestration in general:

"Orchestration is no mere decoration: its function is architectural and colorful. [...] [The arranger's] distribution of color masses will conform to the large design while reflecting the minor play of moods. In short, the instrumental scheme follows the musical plot. [...] decisive changes of scoring are likely to occur at significant places in the form, especially when the sonata or variation types are involved. But the arranger will avoid incessant shifts of color - the restless, mosaiclike manner quickly breeds monotony. Moderation is ever a good motto."

2.1.3 Skills needed by the orchestrator

As mentioned above, various knowledges and skills form the basis of the orchestration activity.

Kennan & Grantham (2002, p. 1) present the following list of what they call "factual information" that the student should acquire at the start:

- Names of instruments and orchestral terms
- Order of instruments on the page
- Ranges of instruments
- Proper notation, including transpositions and special clefs
- General technical abilities and limitations of each instrument (not necessarily the ability to play)
- Principles of combining and of balancing instruments
- Characteristics of various "schools" of scoring

Furthermore, the list is expanded by information "which can be learned only by careful and frequent listening (along with score reading) over a considerable period of time" (ibid, p. 2):

- The characteristic tone quality of each instrument
- The sound of various instruments in combination
- The sound of special effects

At an even higher level, Kennan & Grantham summarize the needed skills as (ibid, p.2):

- Accurate workmanship
- Attention to detail
- A practical approach

Gordon Jacob (1982, pp. 1-2) states that the orchestrator should have:

- A good aural imagination
- Practical common sense
- A clear and well-ordered style
- A mind alert for points of interest
- Showmanship and a sense of the dramatic

Piston emphasizes two basic skills needed by the orchestrator, in prioritized order: Instrument knowledge; and Analysis of scores (Piston, 1955, p. 461). On the first subject, he elaborates:

"The importance of a thorough knowledge of the instruments cannot be too strongly emphasized. Good writing for the instruments is indisputably the largest single factor in good orchestration. [...] Insufficient acquaintance with the instruments is by far the most outstanding defect to be noted in the scores of inexperienced composers. [...]"

In contrast to this, Kennan & Grantham (2002, p. 2) present a somewhat different view:

"Our experience indicates poor scoring on the part of students is more often the result of a failure to understand harmonic and general musical structure than of a faulty knowledge of orchestration. [...] without an understanding of harmonic content and form, intelligent scoring is impossible. In orchestrating, it is of the greatest importance to think in terms of lines rather than in terms of isolated notes."

These two textbooks thus disagree with respect to what are the most important skills. However, it would certainly be a mistake to emphasize one of these to the degree that the other(s) are neglected, and in this sense, the ranking order is in fact quite insignificant.

2.1.4 Literature sources

A number of textbooks have been mentioned so far; they are all specified in the Reference list (Chapter 5).

For the work presented in this thesis, the following books have been particularly useful to me:

- S. Adler: *The Study of Orchestration*.
- G. Jacob: *Orchestral Technique*.
- K. Kennan, D. Grantham: *The Technique of Orchestration*.
- W. Piston: *Orchestration*.

2.2 Review of theory

2.2.1 Instruments

Virtually all textbooks on orchestration start with sections on individual instruments. Such sections usually describe the sound production basics, the pitch ranges with timbral characteristics, idiomatic playing technique (and pitfalls), and special timbral effects (mainly affecting the overtone register) obtained by more or less unusual

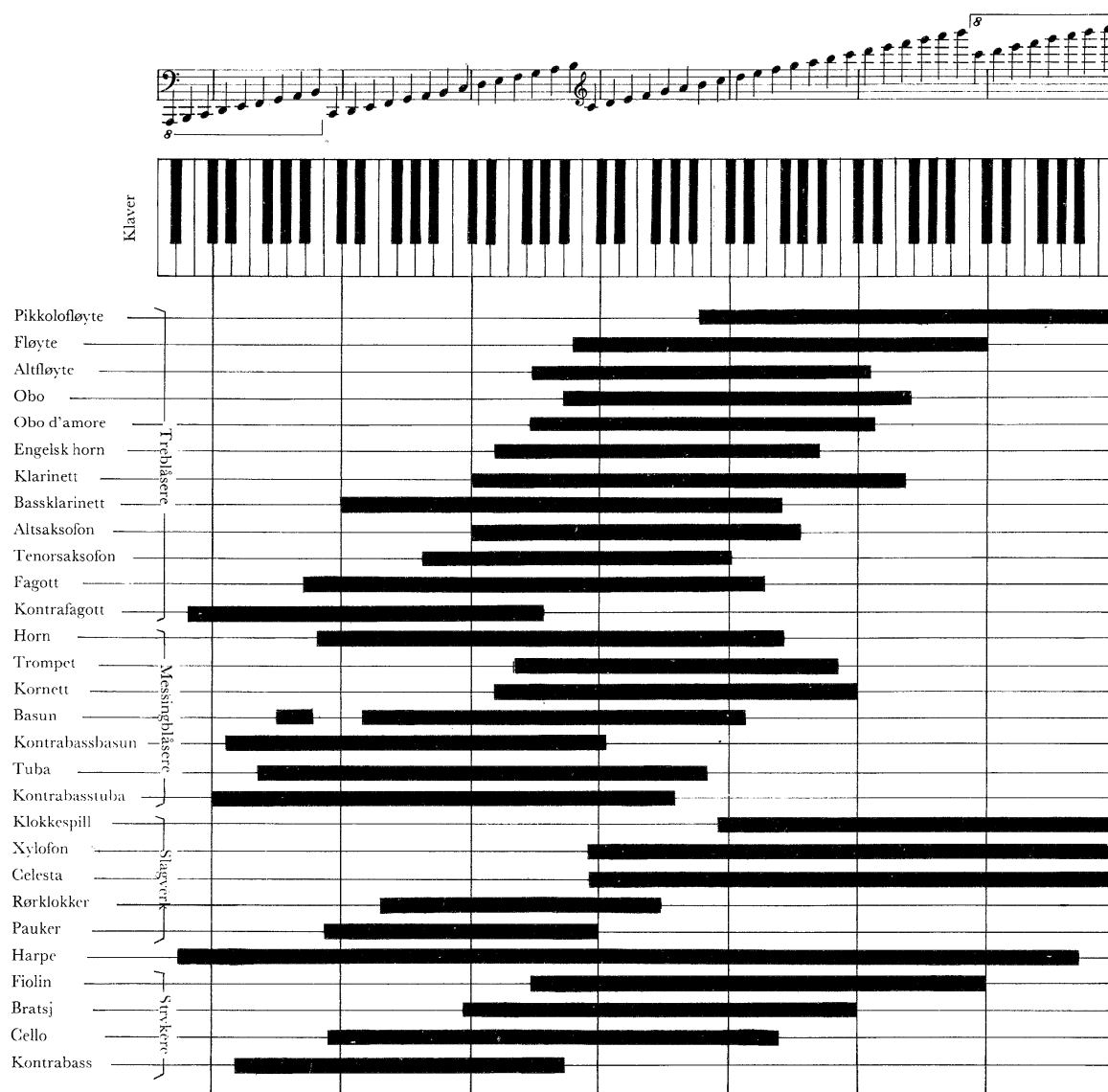


Figure 2.1: Ranges (sounding pitch) of most common orchestral instruments (from Schepelern, 1974, p. 139).

playing techniques, muting devices, etc. Examples of these types of books are: Adler (2002), Jacob (1982)¹, Kennan & Grantham (2002), Piston (1955), Rimsky-Korsakov (1964).

As I have no intention to present an in-depth review of individual instruments, I only refer to the above-mentioned books for these matters. However, an overview of the orchestral forces in terms of pitch ranges may be useful. In Figure 2.1 is shown the sounding pitch ranges for the most common orchestral instruments. The instrument names (in Norwegian) are partly outdated; however, the order of listing corresponds to the modern score.

2.2.2 The orchestra's historical development

According to Gerhard Schepelern (1974, p. 132), the core of the late baroque orchestra was the continuo group (violoncello and double bass, plus harpsichord or organ) and strings. To this basis was added optional instruments depending on the composer's needs and the character of the music: winds (typically flute/recorder, oboe with variants, bassoon, natural horn and trumpet) and percussion (mostly timpani). All these instruments were seldom used in one work; however, Adler mentions such a case by Lully "as early as 1686" (Adler, 2002, p. 4). For operatic scores, Turkish and Mediterranean region percussion instruments like snare drums, triangles, cymbals, small gongs, castanets, and tambourines were used as well (Adler, 2002, p. 431).

During the classical period, the orchestra became more standardized, comprising more or less the baroque orchestra with all optional instruments mentioned above. The main alterations are the exclusion of recorders and keyboard instruments, and the inclusion of the clarinet.

Table 2.1 shows the development of the "standard" orchestra from the late 18th century to the early 20th century, exemplified by a number of important composers and works. It should be noted, however, that some demands, like those of Mahler's 8th symphony or Schönberg's *Gurrelieder*, are more extreme than the "standard" orchestra. The table is adapted by me (translated and chronologically rearranged) from Schepelern (1974, p. 140)².

As indicated by Table 2.1, the main changes in the first half of the 19th century were addition of extreme woodwinds (piccolo and contrabassoon), low brass, harp, and

¹ Jacob's book is more concise than the others listed here, and has briefer descriptions of individual instruments.

² It is not entirely clear whether the numbers are the numbers of instruments or the number of musicians (in most cases, these are identical). However, the numbers in parentheses seem to represent additional instruments (e. g., piccolo) played by one musician (e. g., flutist), or they are alternatives to other instruments (e. g., Wagner tubas instead of horns). Furthermore, the numbers of string players in most cases indicate typical group sizes, i. e., not specified by the composer.

Table 2.1: Size and composition of the orchestra for selected works from the classical period to the early 20th century (reproduced from Schepelern, 1974, p. 140).

		Mozart: The marriage of Figaro (1786)	Beethoven: 9th symphony (1824)	Berlioz: Benvenuto Cellini (1836-38)	Wagner: Lohengrin (1848-50)	Wagner: The Ring cycle (1848-74)	Bizet: L'Arlesienne (1872)	Verdi: Othello (1879-86)	Bruckner: 8th symphony (1887-90)	Puccini: La Bohème (1896)	Schönberg: Gurrelieder (1900-11)	Mahler: 8th symphony (1906)	R. Strauss: Elektra (1906-08)	Stravinsky: Petrushka (1910-11)	Stravinsky: The rite of spring (1911-13)	R. Strauss: Ariadne on Naxos (1912-16)	Ravel: Bolero (1928)	
Woodwind	Piccolo		1	(1)	(1)	1(2)	(1)	(1)		1	4	2	1(2)	(2)	1(2)	(2)	1	
	Flute	2	2	2	3	3	2	3	3	2	4	4	3	4	3	2	2	
	Alto flute														1			
	Oboe	2	2	2	2	3(4)	2	2	3	2	5	4	3	4	4	2	2	
	Cor anglais				1	1	(1)	1		1	(2)	1	(1)	(1)	1(2)			
	Oboe d'amore																(1)	
	Heckelphone												1					
	Clarinet in Eb										(2)	2	1		1		1	
	Clarinet in A or Bb	2	2	2	2	3	2	2	3	2	7	3	4	4	3	2	2	
	Basset horn												2					
	Bass clarinet				1	1		1		1	(2)	1	1	(1)	1(2)		1	
	Saxophone																	3
	Bassoon	2	2	4	3	3	2	4	3	2	3	4	3	4	4	2	2	
	Contrabassoon		1			(1)		(1)			2	1	1	(1)	1(2)		1	
	Horn	2	4	4	4	8	4	4	8	4	10	8	8	4	8	2	4	
	Wagner tuba					(4)		(4)		(4)	(4)	(4)	(4)	(4)	(2)			
	Trumpet	2	2	4	3	3	2	2	3	3	6	4	6	2	5	1	4	
Cornet			2			2	2						2					
Bass trumpet										1		1		(1)				
Trombone (tenor)		3	3	3	3	3	4	3	4	6	4	3	3	3	1	3		
Bass trombone					1					1		1						
Tuba			1	1							1	1		1	2	1		
Contrabass tuba					1			1		1		1						
Percussion	Timpani	2	2	3	2	4	2	2	2	3	6	3	6-8	2	5	2	3	
	Triangle		1	1	1	1				1	1	1	1	1	1	1		
	Cymbal		1	1	1	1	1	1		1	1	1	1	1		1	1	
	Bass drum		1	1		1	1	2		1	1	1	1	1	1			
	Snare drum						1	1		1	1		1	1		1	2	
	Tenor drum					1					1			1				
	Tambourine						1						1	1	1	1		
	Gong					1		1			1	1	1	1	1		1	
	Xylophone									1	1			1				
	Glockenspiel					1				1	1	1	1	1		1		
	Celesta									1	1	1	1	1		1	1	
	Chimes										1	1						
	Other percussion										1							
	Other	Piano											1		1		1	
Mandolin												1						
Harp					1	6	1	1	1	1	4	2	2	2		2	1	
Harmonium												1				1		
Organ												1						
Strings		Violin I	8	12	14	12	16	12	14	16	12	20	16		16	16	3	14
	Violin II	6	10	12	10	16	10	12	14	10	20	16	24	16	16	3	12	
	Viola	4	8	10	8	12	8	10	12	8	16	12	6	12	12	4	10	
	Violoncello	3	6	8	6	12	6	8	10	6	16	12	12	12	12	4	8	
	Double bass	2	4	6	4	8	4	6	8	4	12	8	8	8	8	2	6	

some new percussion instruments. Towards the end of the century, the orchestra expanded further in basically three areas: increasing number of musicians, or duplication of existing instruments; development and inclusion of new wind instruments, both conceptually novel, and variants with new pitch ranges; and further inclusion of new percussion instruments. The trend of exploration of new percussion instruments has continued: "... especially from 1960, the importance of the percussion section has increased enormously, along with the sophistication and complexity of music written for it." (Kennan & Grantham, 2002, p. 225).

Some instruments, however, have not become part of the "standard" orchestra. Examples of such cases are the keyboard instruments listed in Table 2.1, or plucked string instruments like guitar or mandoline.

Both Schepelern (1974, p. 137) and Adler (2002, p. 5) point out that the inclusion of new instruments in the orchestra often was driven by the timbral needs in operas, and that the symphony orchestra then followed.

The size of the orchestra reached a maximum in the beginning of the 20th century. Adler (2002, p. 5) states that:

"By the time of Mahler and Stravinsky, the large orchestra as we know it today was an accepted norm. The strings [...] were 18, 16, 14, 12, 10 [referring to numbers of Vln I, Vln II, Vla, Vc, Db, respectively] [...]. Nor was it uncommon to employ six flutes, five oboes, six clarinets, four bassoons, eight horns, four trumpets, four trombones, two tubas, two harps, piano, and a host of percussion instruments requiring four to five players."

Schepelern (1974, p. 137) claims that performances of Schönberg's Gurrelieder require at least 144 musicians, which probably is the greatest number required by any composition.

2.2.3 Orchestral texture

As already mentioned, vocal or instrumental soloists or groups are not considered here.

In Chapters 19-25 of his book *Orchestration*, Walter Piston describes seven types of orchestral textures (Piston, 1955, Chapters 19-25). It should be noted that these textures may be used to classify any (polyphonic) musical structure, and they are thus not unique for the orchestra. I have summarized the texture types in Table 2.2.

As Piston states, the distinction between texture types may often be vague, for example between melody + accompaniment and part writing, and the texture may also change gradually as the music progresses. Nevertheless, the categories give a useful basis for analysing an orchestral score, or any other polyphonic score for that matter. Piston has illustrated each texture type with examples from the orchestral literature,

and these examples show how rather complicated orchestral scores can be broken down and classified.

Gordon Jacob (1982, Chapter IX) presents a classification fairly similar to Piston's. Table 2.3 shows how the two sets of categories are related. There is a difference in the example material, however: whereas Piston analyzes the textures of existing orchestral scores, Jacob illustrates his points with excerpts from the piano literature, and show how these might be realized with orchestral forces. This difference in approach implies that the two books complement each other nicely.

A third approach is found in Adler's book (2002, Chapter 15), the main categories being:

- Unison (or octave, or multi-octave) tutti.
- Distribution of foreground-middleground-background elements within homophonic texture.
- Distribution of foreground-middleground-background elements within polyphonic texture.
- Distribution of foreground-middleground-background elements within a varied texture.

Within these categories, Adler covers such topics as melody with accompaniment, and voicing of chords. Thus, the overall content is not as different from Piston's or Jacob's presentations as might be anticipated from first glance.

Like Piston, Adler illustrates with examples from existing orchestral works. Of particular value in Adler's presentation is the frequent advices on instrument doublings, i. e., how to blend and balance instruments from different groups.

Table 2.2: Seven types of orchestral texture, as described by W. Piston (adapted from Piston, 1955, Chapters 19-25).

Texture type	Explanation
I Orchestral unison	Only one element (melody), with instruments at true unison (same pitch), or at octave transposition with each other.
II Melody and accompaniment	Only melody and accompaniment, with no further distinction of either.
III Secondary melody	Three-element texture, with primary melody, secondary melody, and accompaniment.
IV Part writing	Three or more voices of approximately equal importance.
V Contrapuntal texture	Several melodic (or quasi-melodic) lines, imitative or independent.
VI Chords	"Isolated" chords, with negligible voice leading.
VII Complex texture	Either any combination of two or more of the six previous textures, or "an ensemble of many elements, none of which emerges as a primary element" (Piston, 1955, p. 409).

Table 2.3: G. Jacob's types of orchestral texture (adapted from Jacob, 1982, Ch. IX), compared to W. Piston's texture types (see Table 2.2).

Texture type (Jacob)	Corresponding texture type (Piston)
1. Homogeneous, chordal passage	IV; VI
2. Melodic line on the top, accompanying figures below	II
3. Melodic line in the middle, accompanying figures above and below	II
4. Melodic line in the bass, accompanying figures above	II
5. Two melodic lines simultaneously with accompanying figures	III
6. Entirely polyphonic passage	V

2.3 Transcription of piano scores for orchestra

2.3.1 General guidelines

Since part of this study concerns the orchestration of an existing piano composition (Chapter 4), it is appropriate here to investigate the literature for guidelines and advice.

Several textbooks deal with this challenge. The following general advice is offered by Jacob (1982, p. 12), for transcription in general (between any instruments):

“The secret of effective arrangement is in adapting the idiom of your original to that of your instrumental medium. A good arrangement should sound as though it were an original composition, and not an arrangement at all. In short, it is often necessary to alter the letter of the original in order to preserve its spirit.”

Adler (2002, p. 667) comments on transcription in general (i. e., between any instruments), that the following skills are necessary:

- A thorough knowledge of all instruments: capabilities and characteristics of their range.
- An intimate knowledge of the piece's structure.
- An insight into the orchestral style of the composer, or at least of his era.
- A love for the work to be transcribed.
- A valid reason to transcribe a particular work.

When it comes to the transcription from keyboard to orchestra, Adler gives the following practical advices, the first of which echoes Jacob's statement (ibid, pp. 668-672):

1. *Do not try to simulate the piano; instead, change piano idioms to orchestral while retaining the spirit of the music. [...]*
2. *Remember that the piano is played by one person, while the orchestra is an aggregate of many; problems that never interfere with the performance of the pianist may crop up in an orchestral transcription. [...]*
3. *A crescendo, diminuendo, rubato, or even a fermata is made clearer when actually written into the musical texture of an orchestral score. For instance, you can create a crescendo simply by adding instruments [...].*
4. *We must correctly interpret important piano notations [...]. For instance, for una corda pedalings in the piano score [...], we might want to mute the orchestral instruments [...].*
5. *You should be thoroughly familiar with the music [...] so that you can compose out all implied harmonies and melodic lines in the original piano version more fully in the orchestral transcription. [...] In addition, you must recognize the idiomatic piano writing necessitated by the physical limitations of a single pianist. You might set chords that are arpeggiated in the piano version because of the limited span of the human hand as block chords for orchestra [...].*
6. *When a contrapuntal piano work is to be orchestrated, the limitless color possibilities of an orchestra are tantalizing. [...] However, you should not make things so colorful as to obscure the form or upset the musical scheme [...]."*

2.3.2 Special challenges

There are many differences between piano and orchestra that should be taken into account when transcribing from one to the other. Some of these were mentioned in the previous section. Here is a more comprehensive list, relating to both the musician(s) and the instrument(s):

- The piano score is limited to two hands, each spanning intervals up to about a ninth (unless chords are broken).
- Complex (poly-)rhythmics may turn both ways: The pianist can handle only a few diverse rhythms simultaneously, whereas the orchestra in principle can produce one rhythm per instrument. On the other hand, the pianist may play intricate rhythmic-motoric patterns that are challenging to get exact if divided (due to e. g. register considerations) between several instruments.
- Keys with many sharps or flats might need to be transposed for the orchestra.
- The piano has limited possibilities of voice diversion (this applies mainly to polyphonic music), and the overall sound possibilities are much larger for the orchestra.
- Most orchestral instruments can adjust (develop) a sounding tone; the piano tone can only decay after the attack.
- The orchestra has no equivalent to the sustain pedal.

Some of these differences are significant only when transcribing from the orchestra score to the piano; thus, they are of less concern here.

Jacob (1982, p. 11-12) gives the following advice when transferring piano chords to the orchestra:

- “(i) *When transcribing a passage from piano score in which the two hands are spaced far apart, fill in the gap in your arrangement.*
- “(ii) *When thick low-placed chords occur in the left-hand part, rearrange them with a clear octave at the bottom of the chords.*”

The problem of remote keys is addressed by Kennan & Grantham (2002, p. 188):

“... if the original [i. e., piano] music is in a remote key – say, more than four sharps or flats – it is sometimes wise to choose a more comfortable and resonant key for the orchestral version (probably a half step higher if the piece is brilliant, a half step lower if it is not).”

They consider the aesthetic problem of changing the composer’s choice of key, but conclude that the benefit from playing in a comfortable key often justifies such a change. They further postulate that sharp keys are better than flat keys for the strings (ibid, pp. 188-189). At the same time, it is well known that wind instruments, especially those transposing into flat keys, favour flat keys. Thus, the advice of maximum four sharps or flats seems reasonable for an orchestra comprising both winds and strings.

2.3.3 *The sustain pedal*

This is a challenging topic that requires a more thorough investigation. An instructing example is given by Kennan & Grantham (2002, Chapter 12). All the following figures are reproduced from this textbook.

The piano excerpt is from one of Brahms' latest piano compositions (Figure 2.2).

For this example, Kennan & Grantham assume that the available orchestra consists of strings, woodwinds in pairs, and four horns. Four solutions are shown in Figure 2.3.



Figure 2.2: Two bars from J. Brahms: Intermezzo, op. 119 no. 2 for piano, middle section (reproduced from Kennan & Grantham, 2002, p. 208).

The figure displays four different orchestral realizations of a musical passage from Brahms' Intermezzo, each titled "Andantino grazioso". The instruments involved are Oboe (Ob.), Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vc.), and Double Bass (Db.).

- Top Left:** Oboe plays the melody (*p dolce*). Violins I and II play sustained chords (*pp*). Viola and Cello play a broken chord pattern (*pp*). Double Bass plays a sustained chord (*pp*).
- Top Right:** Horns (Hn.) play sustained chords (*pp*). Violin I plays the melody (*p dolce*). Violin II plays sustained chords (*pp*). Viola and Cello play a broken chord pattern (*p divisi dolce*). Double Bass plays a sustained chord (*pp*), with a note for "1/2 Basses".
- Bottom Left:** Clarinet (Cl.) plays the melody (*p dolce*). Violins I and II play sustained chords (*pp*). Viola and Cello play a broken chord pattern (*pp*). Double Bass plays a broken chord pattern (*pizz pp*) with the instruction "arco" below.
- Bottom Right:** Violins I and II play sustained chords (*pp con sord*). Viola plays sustained chords (*pp con sord*). Cello plays a broken chord pattern (*p dolce pizz*) with the instruction "solo" above. Double Bass plays a broken chord pattern (*pp divisi pp*).

Figure 2.3: Four possible orchestral realizations of the bars from the Brahms Intermezzo in Figure 2.2 (adapted from Kennan & Grantham, 2002, p. 210).

It is interesting to compare how the broken chord harmonies of the piano piece have been realized. In all cases, the broken chord is assigned to the cello because of the register. The harmony is further provided by the other strings (or supported by horns in the case that upper strings play the melody). The harmonies E and B⁷ with E as organ point are in three cases complete on the first beat of the respective bars; in the

forth case, the harmony-defining notes (#G and #F, respectively) do not occur until the second beat. However, the audio examples (the Kennan & Grantham book comes with a CD) show that all four orchestrations yield a satisfying result. The careful balance between the instruments is probably a major reason for this. Furthermore, when consulting the other textbooks, I find that they in general recommend solutions similar to those in Figure 2.3, with respect to mimicking the effect of the sustain pedal.

Brahms repeats the same theme eight bars later. The music is then intensified by playing the melody in octaves (as written, plus the octave above; the alto voice is transposed up as well). Kennan & Grantham show several examples of how this may be reflected in the orchestration: doubling of the melodic line by more instruments in unison or octave (strings, if woodwinds were used first time, or vice versa); adding more instruments like horns or bassoons to strengthen the harmonic or bass parts. It is however interesting to note that the broken chord is never doubled in these examples, and the sustain pedal solution is basically the same.

2.3.4 Concluding remarks

The piano score often represents a neat starting point for an orchestral realization of a piece of music, both for educational purposes and in practical compositional activity. This is probably the reason why many textbooks (e. g., Jacob (1982), Kennan & Grantham (2002), and Adler (2002)) have thorough chapters on the task of transcribing from piano score to orchestra.

Here, I have only been able to touch upon this complex subject, which requires skill, imagination, and experience. A closer study would definitely be both interesting and rewarding.

3. *Score analyses*

In this chapter, I will attempt to analyze the orchestration of some works from the classical, the romantic, and the modern (20th century) periods. I have selected the following music:

W. A. Mozart: Symphony 40, 1st movement

B. Smetana: Vltava

B. Bartok: Concerto for orchestra, 4th movement

The selection was primarily determined by my need to know the music well, so that I throughout could recall the music just by inspecting the score. Besides, I needed easy access to the respective scores.

Each piece of music will first be examined separately (Sections 3.2 through 3.4). In the discussion section (3.5), I will address the questions related to the methodology I have chosen, and further discuss what comparisons can be made and what conclusions can be drawn, given the small size and sample nature of the investigated works.

3.1 **The analysis of orchestration**

3.1.1 *The objective of an analysis*

In part two (entitled Analysis of orchestration) of his book, Walter Piston starts by defining the objective of such an analysis (Piston, 1955, p. 355):

"The objective in analysis of orchestration is to discover how the orchestra is used as a medium to present musical thought. Its immediate purpose is the simplification of the score so that order is seen [...] It is a means of studying how instruments are combined to achieve balance of sonority, unity and variety of tone color, clarity, brilliance, expressiveness, and other musical values. Ultimately, the analytical process shows the differences in orchestral style between various composers and periods."

3.1.2 *The steps of an analysis*

Piston goes on to define the necessary steps in this process (Piston, 1955, pp. 355-356):

1. Examination of the musical structure, apart from orchestration, to reveal the basic constituents ("component elements"): melody, harmonic background or accompaniment, contrapuntal lines, chords, etc.³

³ These elements have been described in Section 2.2.3.

2. The distribution of instruments and sections of the orchestra among the elements.
3. Comparison of the elements, evaluating the results of the distribution as to balance and contrast.
4. Close examination of each element taken separately: choice and combination of tone colors, doubling and spacing, reinforcing of accents, etc.

Piston concludes his introduction with two important remarks:

"The importance of judging the movement as a whole should not be lost sight of. Proportions of tutti, unity and variety of textures and orchestral procedures, etc., are larger considerations to be weighted in relation to the form and content of the movement, and are not to be underestimated. [...]" (ibid, p. 356)

"A word of warning is sounded against a too pedantic and literal approach to the analysis. One seeks an answer to the question why certain procedures are followed, but, orchestration being an art and not a science, one must ever be prepared to find no good reason. Some questions are never answered. [...]" (ibid, p. 356)

As will become apparent from the following sections, I have attempted to apply these guidelines in my analyses. A more detailed discussion of the methodology I have chosen, follows at the end (Section 3.5).

3.2 Mozart: Symphony 40, 1st movement

I have used a score published by Dover Publications (Mozart, 1997), which according to the publisher is a re-publication of Breitkopf & Härtel's *Wolfgang Amadeus Mozart's Werke. Kritisch durchgesehene Gesamtausgabe*, published in Leipzig in 1880-1882.

The symphony was originally scored for flute, 2 oboes, 2 bassoons, 2 horns, and strings. All these instruments are used in the 1st movement. In a later version, revised by Mozart, the composer has added 2 clarinets and reworked the oboe parts. My analysis here is based on the original scoring, without clarinets.

An overview of the orchestration of the movement is shown in Figure 3.1.

A note on the diagram: I have classified the various instruments into four categories: Melody, Countermelody, Harmony, and Bass line. By "Melody" is meant the immediate foreground, the themes heard as most important. A distinction between 1st / 2nd / side themes or subjects in the traditional sense has been considered irrelevant here. Similarly, "Countermelody" is used to denote a semi-solo or middleground theme. Thus, unlike traditional theme analysis, one single theme may here be classified into different categories, depending on the actual context. Furthermore, an instrument playing the main notes of another instrument's Melody is basically classified as Countermelody; however, this depends on how far the Melody is reproduced. The terms "Harmony" and "Bass line" are used more traditionally to denote instrumental parts with basically harmonic function, or, more specifically, the actual bass line

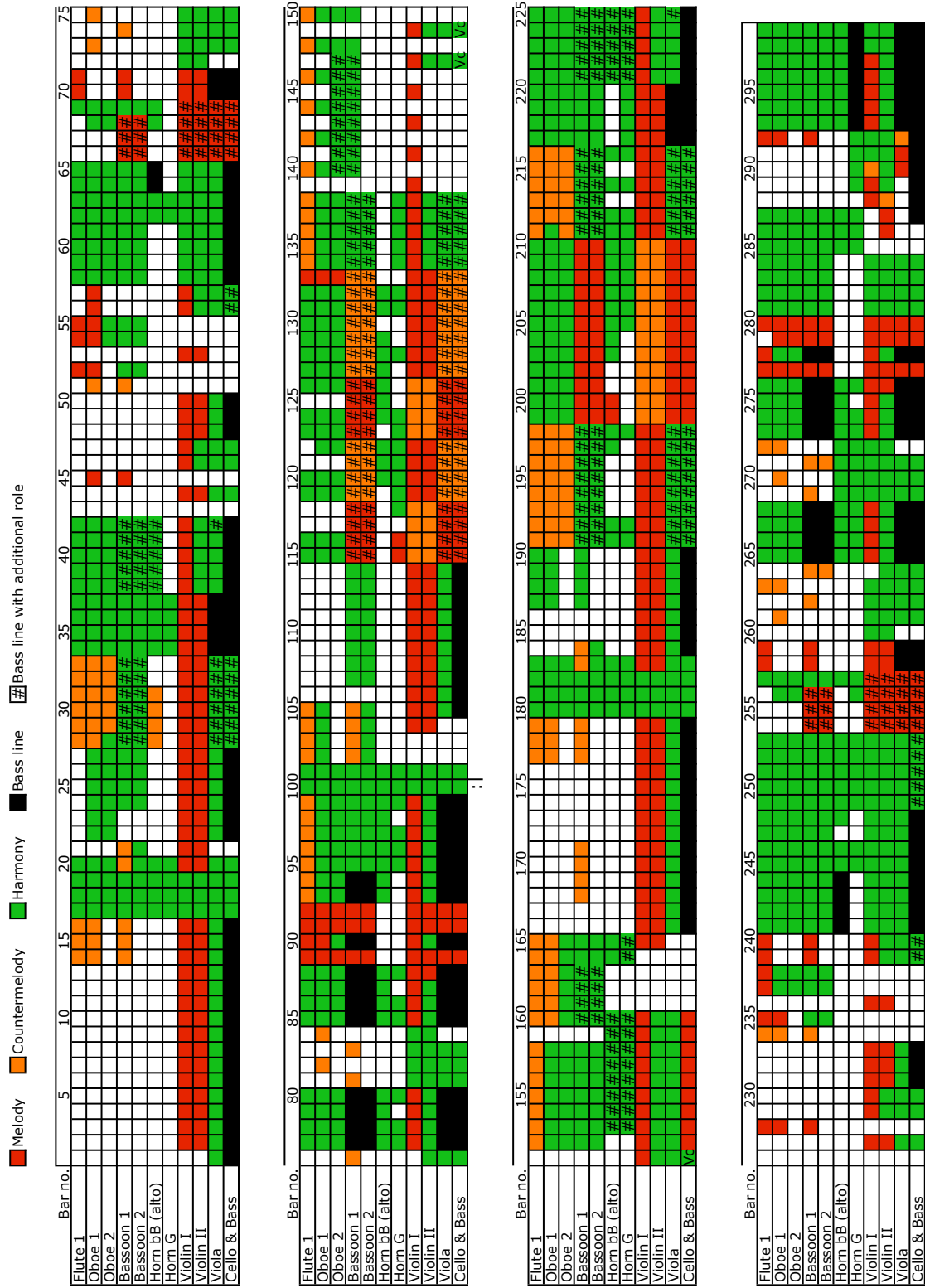


Figure 3.1: The orchestration of Mozart: Symphony 40 (1st movement), classified as Melody, Countermelody, Harmony, Bass line, or Bass line with additional role.

wherever this is clearly discernible. It should be noted that Melody and Countermelody are generally classified by ear, whereas Harmony and Bass line are classified from the written score. Finally, since the Bass line may simultaneously take another important role as Melody, Countermelody, or blend more with the Harmony (see, e. g., bars 28-33), hatching is used to indicate these situations.

With this classification into the four chosen categories, it is clear that there should be some correlation between the diagram and Piston's seven texture types (Section 2.2.3). This will be further discussed at the end of this chapter.

The classification shown in Figure 3.1 can justly be criticized as both subjective and imprecise. This will be discussed at the end of the chapter. However, assuming that the use of each instrument is in general fairly well depicted, it is possible to make some observations regarding Mozart's orchestration of this movement:

- The perhaps most striking feature is the variety of the score. Although structural elements such as main and side themes, or exposition / development / recapitulation are reflected in the orchestration, it is fair to say that on the whole, the instruments are combined in ever-new constellations. Each combination is typically used for 4-16 bars (occasionally just 1 or 2 bars), thus reflecting the phrase length of the musical material. Even when comparing the sections that traditionally are most similar - exposition vs. recapitulation (from bar 166) - it appears to be a trend that the orchestration is reworked rather than just duplicated. This is probably not just a necessity due to the side theme's shift of key (from bars 44 and 227, respectively), as the shift is just a minor third, and the tendency is as prominent for the main theme, which is presented in g minor both times.⁴
- Melody:
 - Mainly assigned to Violins I and II, often in unison.
 - Almost never played by horns.
 - When in woodwinds, basically one of three configurations: a) flute/oboes in short and soft passages, changing with violins; b) bassoons + low strings; c) tutti unison.
- Countermelody: Often in flute+oboes or flute+oboe1+bassoon1.
- Bass line: Mainly cellos + basses, sometimes supported by bassoon(s) or (seldom) horn. Note that cellos and basses almost always play in unison.
- The use of horns coincide fairly well with the orchestral tutti sections. This indicates that the horns are not primarily applied for their timbral properties, but rather to add volume in the forte sections.

⁴ Considering the melodic element, E. Toch points out how Mozart, in the last movement of Symphony 40, presents the second subject in eight different disguises, instead of plain repetition, and concludes: "With such an unlimited supply of new ideas no stagnation can arise" (Toch, 1977, pp. 197-200). It is therefore no surprise that the ideas for instrumental combinations seem equally unlimited.

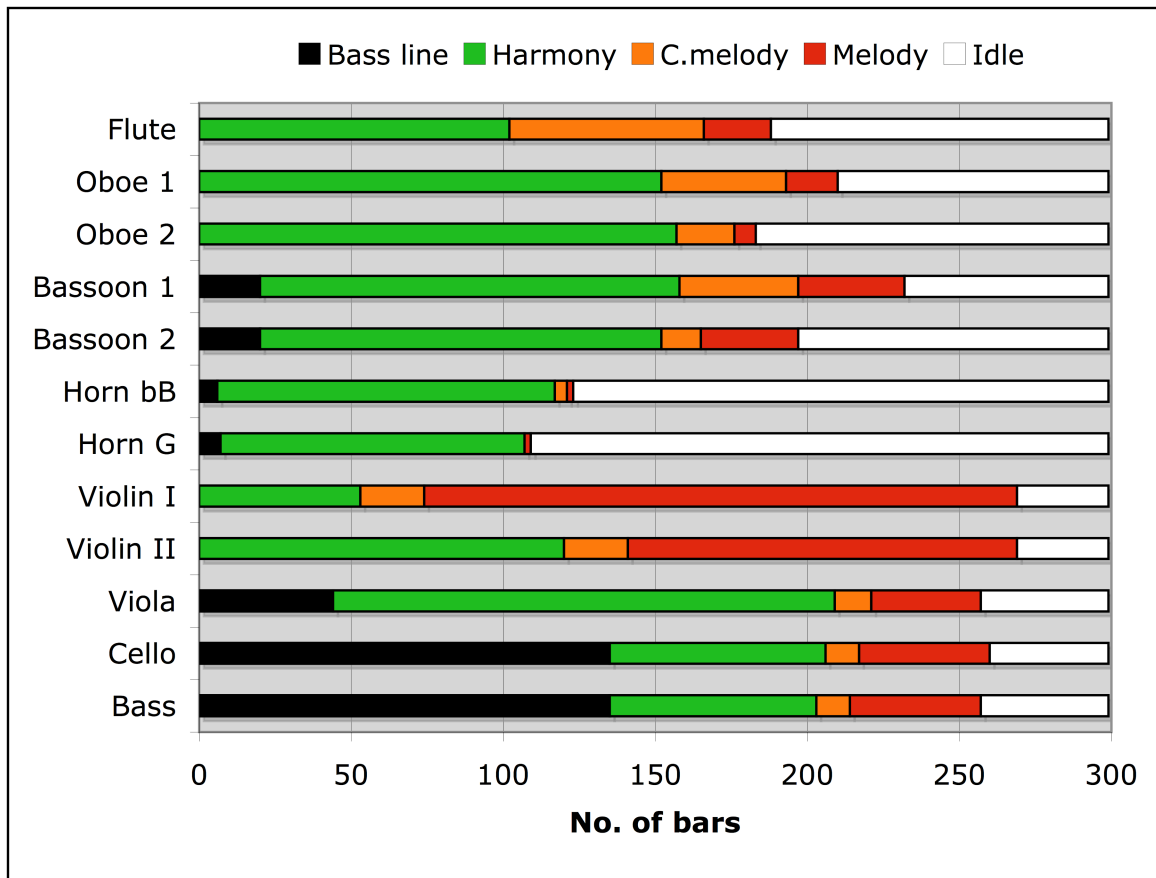


Figure 3.2: The orchestration of Mozart: Symphony 40 (1st movement), in terms of overall application of instruments for Melody, Countermelody, Harmony, and Bass line.

Some further insight (on a statistical level) can be gained from mere counting of bars, as shown in Figure 3.2. Here, the "Bass line with additional role" bars have been counted together with the "additional role" bars, and the reprise of bars 1-100 has been omitted.

Unlike Figure 3.1, Figure 3.2 does not show how the instrumental forces are combined. It still confirms the distribution of instruments on the Melody, Countermelody, and Bass line categories that was commented on above. Furthermore, the use of various instruments and instrument groups can be summarized as:

- Strings:
 - Used in ca. 250-270 bars (out of 299), i. e. close to 90% of the movement.
 - Violins I and II are predominately used for Melody (often in unison); Violins II and Violas for Harmony; Cellos and Basses for Bass line.

- Woodwinds (except horns):
 - Used in ca. 200 bars, i. e. ca. 65%.
 - Predominately used for Harmony, occasionally for Melody or Countermelody.
- Horns:
 - Used in just above 100 bars, i. e. ca. 35%.
 - Almost exclusively used for Harmony.
 - Used mainly in tutti sections, to strengthen the forte (from Figure 3.1).

3.3 Smetana: Vltava

The score used here was published by Edition Eulenburg (Smetana, 1972). Bar numbers and instrument names refer to this pocket score. I have classified the orchestration of Vltava using the same categories and colour coding as in the Mozart movement. The colour coded score is shown in Figure 3.3.

A decision had to be made with respect to the Countermelody and Harmony categories. One option was to consider the beginning flute motif as Countermelody (or even main Melody). However, this motif develops gradually into the "water stream" underlying the main theme (from bar 40, and reprised from bar 239), and can also be found in somewhat altered form in the "Mondschein" episode (from bar 185). Thus, although the motif sometimes can be perceived as a secondary melody, its main significance is to provide an underlying pattern of constant motion, i. e., basically a harmonic background. I have therefore chosen to categorize this motif as Harmony. Another argument for this decision is that the motif is throughout the piece divided between several instruments, often intercepted by broken triads (of half-bar length or so) that clearly serves a harmonic function; thus, categorizing the motif as Countermelody and the triads as Harmony would have been a cumbersome exercise, and the insight this might have given would probably be very limited.

Having made this choice, the two main occurrences of Countermelody appear to be bars 80-117 and bars 271-ca.325. The first of these episodes is the "Wald. Jagd" (Forest. Hunt) theme, basically presented as a horn signal (in repeated eighth notes or triads), whereas the second is the "St. Johann-Stromschnellen" (St. John rapids) episode, where the hunt motif blends with a version of the main Vltava theme. Admittedly, the foreground in these two episodes might be categorized as Melody; however, due to the overall aural impression I have chosen to denote it as Countermelody.

Similarly, the distinction between Bass line and Harmony may be hard to define, i. e., it may be advantageous to consider the Bass line as part of a chordal (harmonic) sequence. The hatching symbol has been applied to such ambiguous cases. A typical section in Vltava is the ending (from ca. bar 374), where linear/melodic elements almost cease to exist, and the music reverts to the alteration of dominant-tonic chords before settling exclusively on the tonic. In my opinion, the bass notes E and B in this section typically belong to the harmonic progression, rather than constituting a bass line of particular significance on its own.

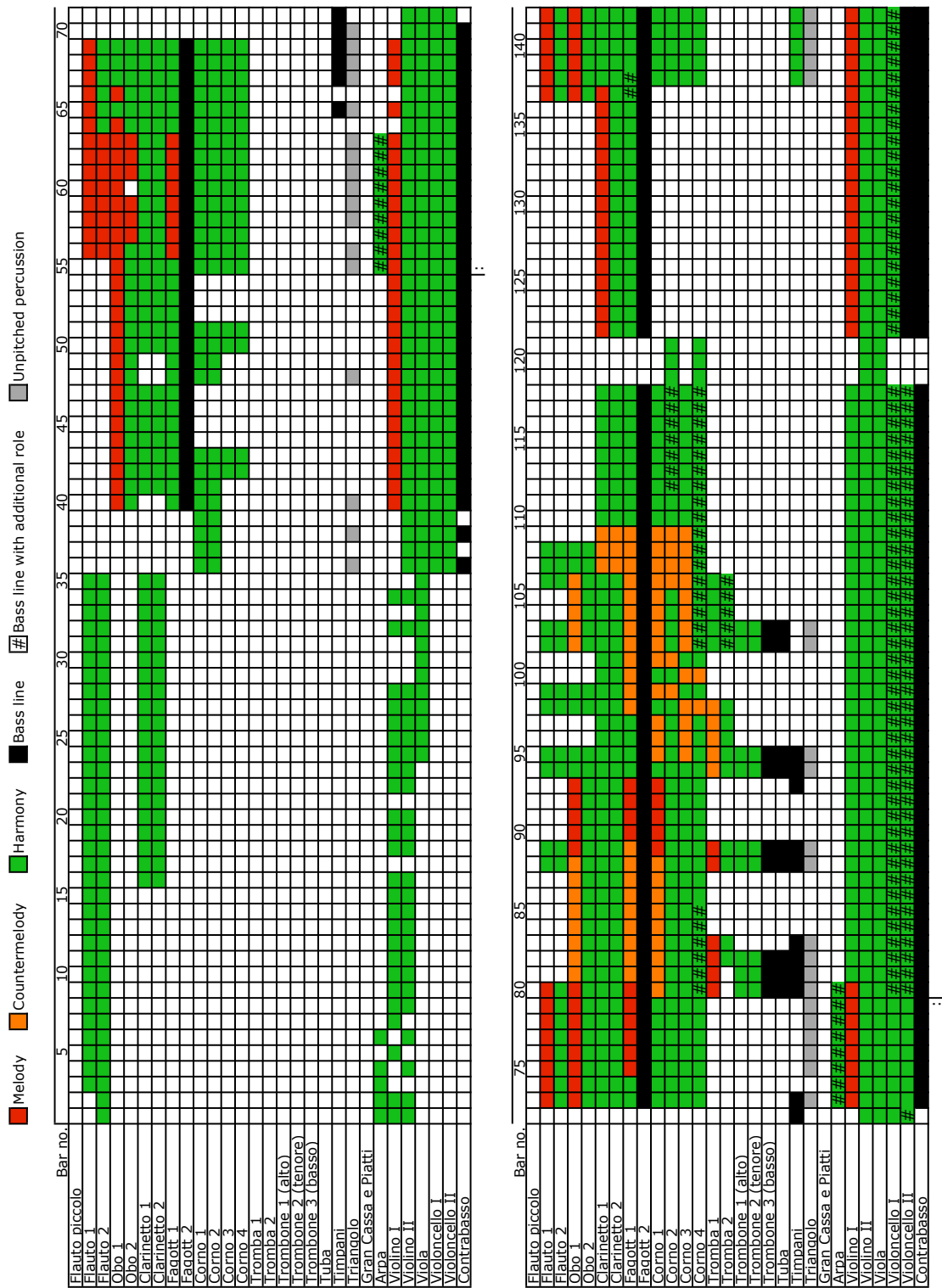


Figure 3.3: The orchestration of Smetana: Vltava, classified as Melody, Countermelody, Harmony, Bass line, Bass line with additional role, or Unpitched percussion.

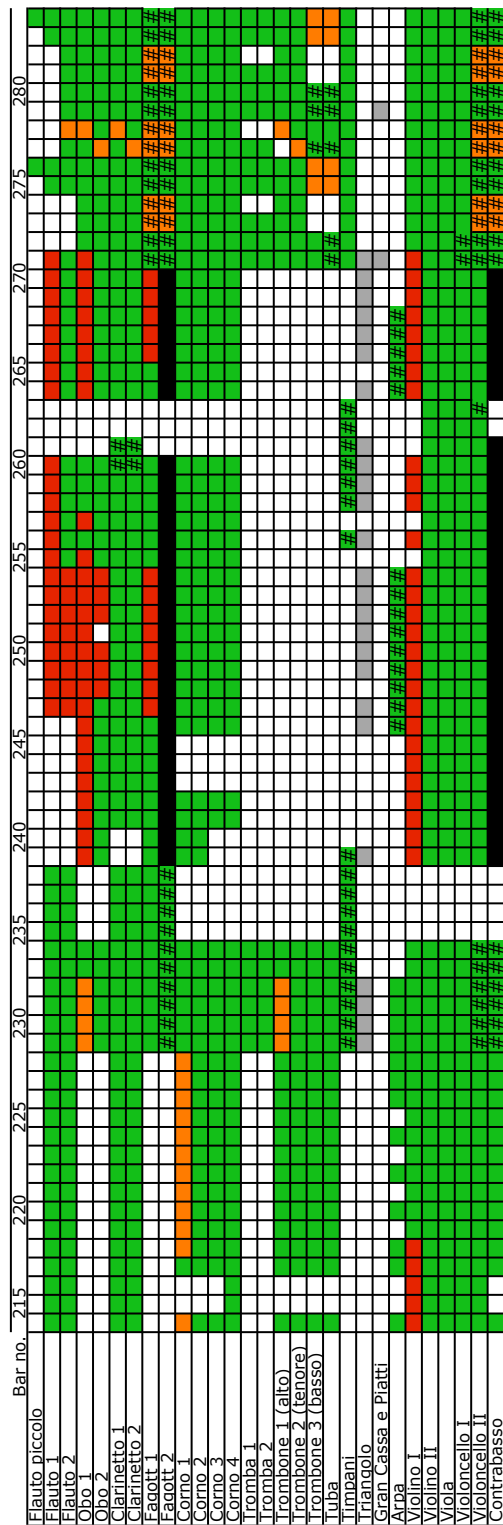
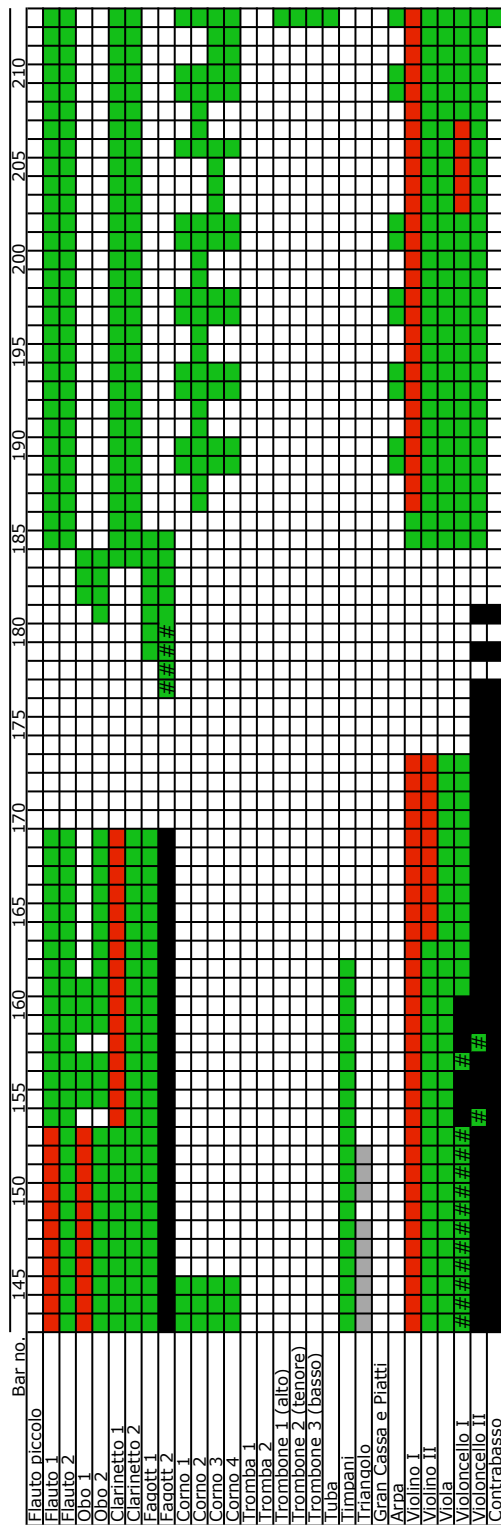


Figure 3.3 (continued).

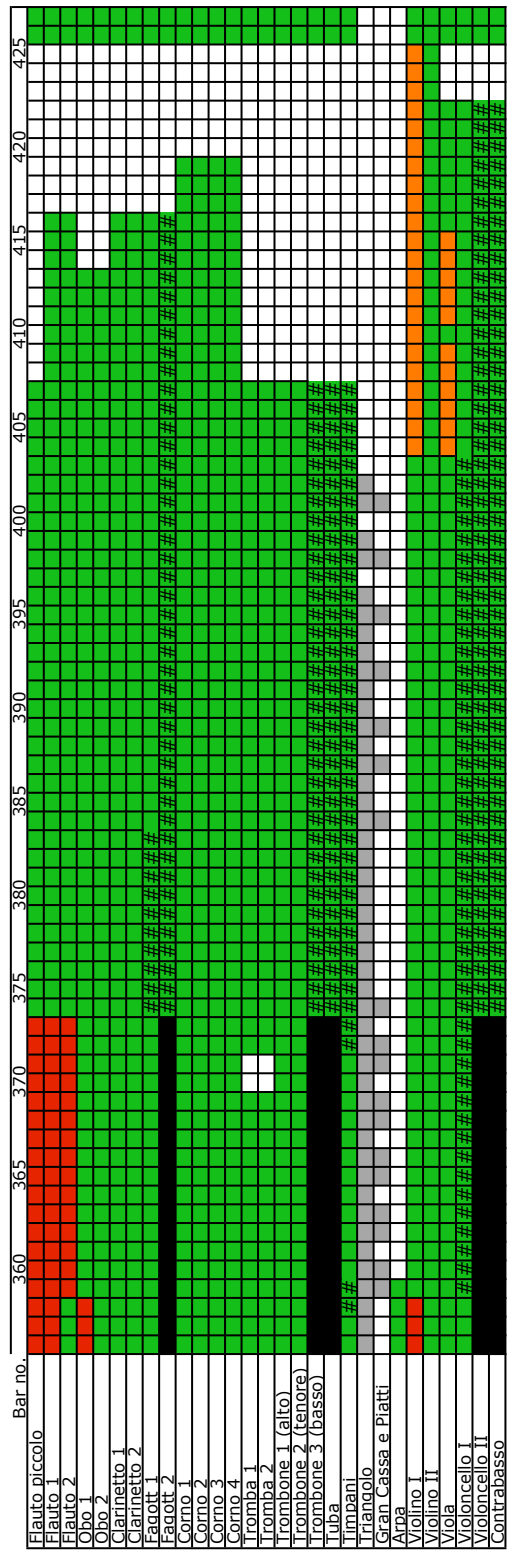
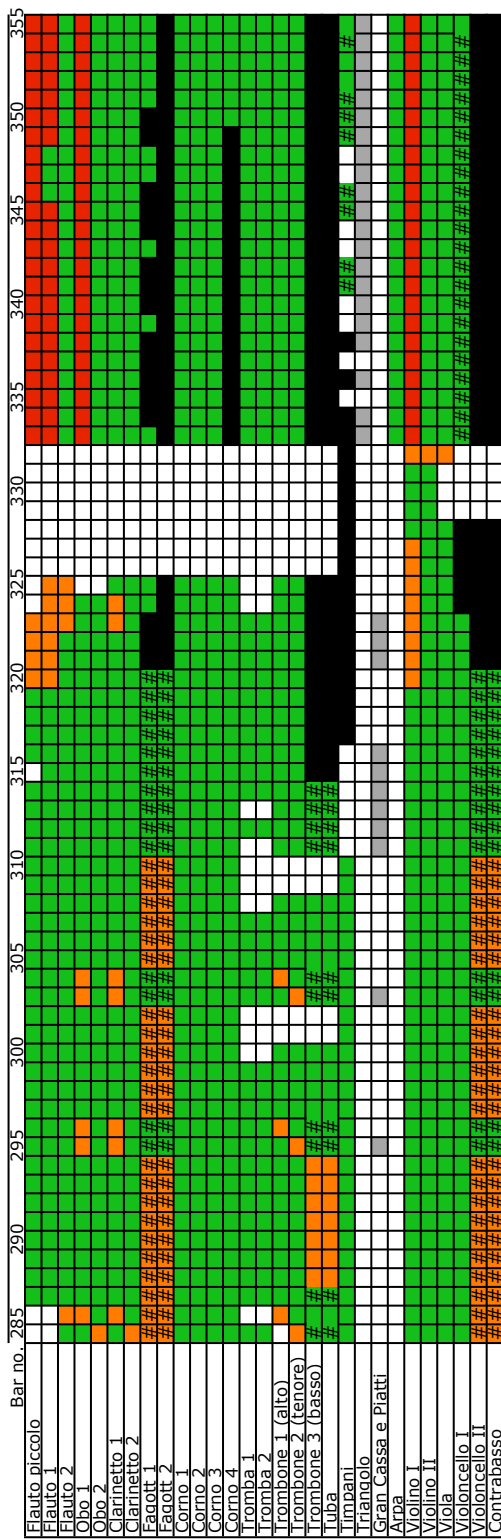


Figure 3.3 (continued).

Figure 3.3 shows that the orchestration of Vltava basically follows the larger structural blocks of the work. Once an instrument combination is chosen, it is used for typically 16-32 bars with only small changes; this block length corresponds to the thematic phrase lengths.

In Vltava, Smetana generally requires the cello group to divide, such that VcI, VcII, and Db either play three independent lines, or VcII doubles Db at the octave. These lower strings then play the Bass line, mostly in combination with Bassoon2. In particularly loud sections, the Bassoon1, the 3rd Trombone, and the Tuba join the bass line, in some places supported by the timpani. All this use of the instruments is according to common practice.

The Melody is mainly given to the 1st Violins, or to the Flute1 and/or Oboe1. To a lesser extent, the Melody is played by the Piccolo or Flute2 (either of them doubling Flute1), the Clarinet1, or the Bassoon1 (doubling the other woodwinds). In general, the woodwind's melody is doubled by the 1st Violins. The emphasis on Vln1, Flute1, and Oboe1 as melodic instruments may be unusual, in light of the total available forces. However, including the Countermelody, which is often given to bassoons, lower strings, or Horn1, the picture becomes more diversified.

The harmonic function is taken care of by all the main instrument groups: woodwinds, brass, and strings. This is according to common practice, considering the overall romantic character of the piece.

The full brass section and the loud percussion (Timpani and Gran cassa) are typically called for in tutti sections. In sections of moderate to soft loudness, however, these instruments are left out, whereas the horns and the woodwinds typically are used to enrich the timbre. The strings are applied almost throughout the piece, whether they play Melody, Bass line or Harmony. All these features conform with rather standard orchestration technique.

Between the large structural sections of the piece, Smetana typically uses a rather sparse instrumentation for a few bars (notably at bars 70-72, 119-121, 174-184, 235-238, and 329-332). The effect on the listener is that one section is allowed time to "fade out" and come to rest before the next section is introduced, typically with new and "fresh" instrumentation. This way of building alternating tension-relaxation periods can also be seen as typical romantic features, and quite usual for symphonic compositions of relatively large proportions.

Looking for craftsmanship details, we find that Smetana avoids exhaustion of the winds by distribution phrases between several players. For example, in the introduction (bars 1-27), the two flutes (and later, the two clarinets) alternately play half bar phrases, thus allowing the rest of the bar for breathing. The phrase overlap, i. e., the sixteenth/eighth note played by both instruments, is necessary and sufficient to create a continuous flow, such that the whole section appears to be played in one breath. In bars 28-35, however, the parallel sixths require continuous playing by both flutes; thus, the flutists are entrusted to their ability to breath rapidly. The clarinets, however, are allowed pauses in the corresponding parallel thirds, probably due to this larger woodwind instrument requiring greater air pressure and thus being more exhaustive to the musician.

Figure 3.4 summarizes the overall use of instruments, in terms of number of bars applied to each category. As in the previous section, the hatched bars (Bass line with additional role) have been counted according to the "additional role". The repetition of bars 55-79 is not counted; hence, the total number of bars is 427. The figure highlights and confirms some of the earlier observations:

- Strings are used in ca. 90% of the piece;
 - Violins I half of the time for Melody
 - Double basses (and to some extent, Cello II) for the Bass line
 - Otherwise, the strings are used for Harmony

- Woodwinds and horns are used in ca. 2/3 of the piece;
 - For Melody, Flute1 and Oboe1 dominate
 - The Bassoon2 is used for the Bass line half of the time
 - The Melody is sometimes assigned to the other flutes, Clarinet1 or Bassoon1; and the Countermelody to the bassoons and Horn1
 - Horns2-4 almost exclusively play Harmony

- The brass is used in ca. 1/3 of the piece;
 - Basically for Harmony
 - Trombone3 and Tuba also play the Bass line, for ca. 1/3 of the time they are applied

- Timpani is used in ca. 40% of the piece, which seems to be pretty much. However, a single stroke in a bar makes the bar counted in this diagram. The same is the case with the other (unpitched) percussion instruments. The high proportion of Harmony bars for the timpani is due to the choice of classifying a non-distinct bass voice as Harmony.

- The harp is used in ca. 20% of the piece, and exclusively for Harmony purposes.

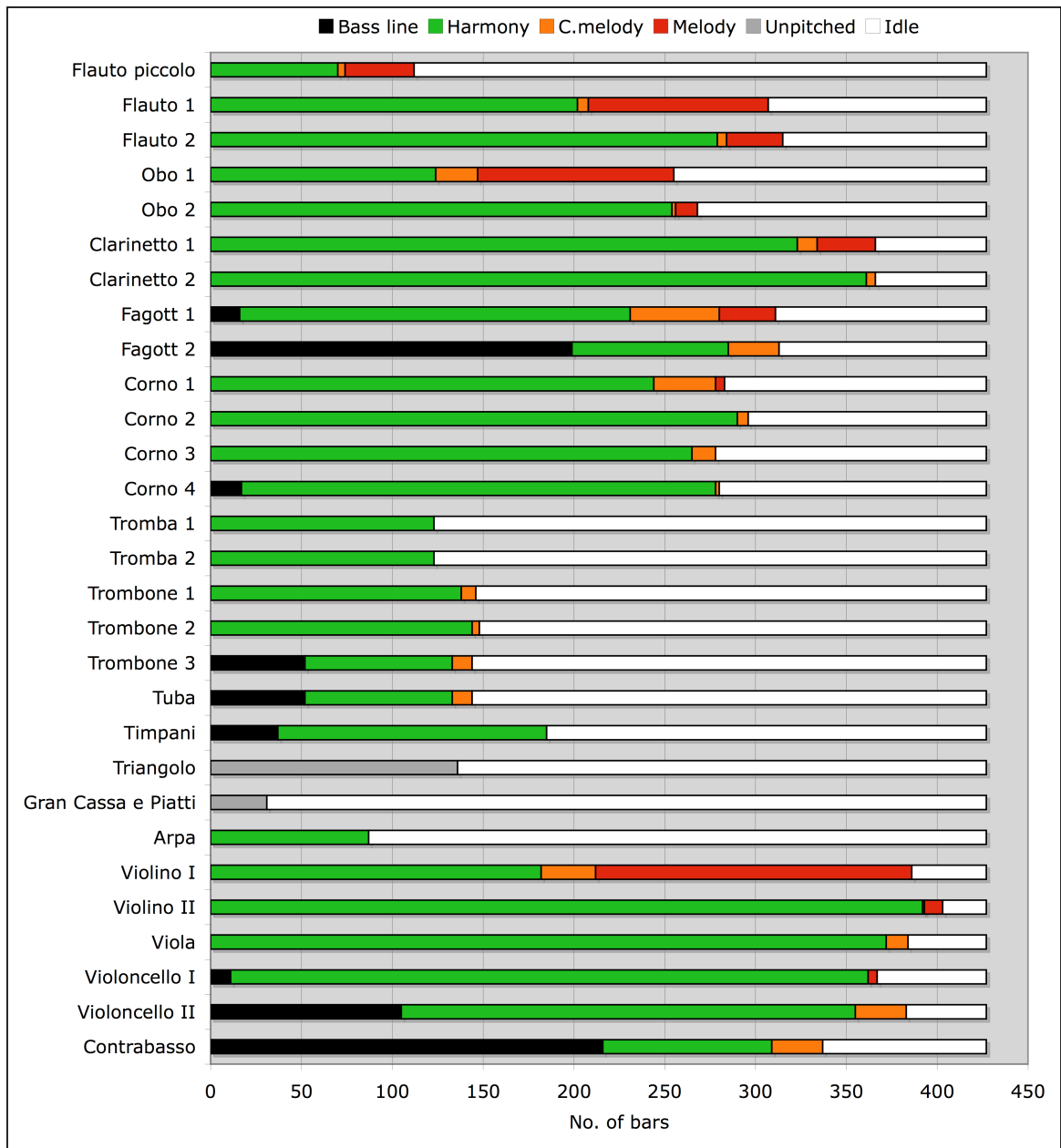


Figure 3.4: The orchestration of Smetana: Vltava, in terms of overall application of instruments for Melody, Counter melody, Harmony, Bass line, and Unpitched percussion.

3.4 Bartok: Concerto for orchestra, 4th movement

The score used here was published by Boosey & Hawkes (Bartok, -). The orchestration is colour coded according to the scheme used earlier, and the result is shown in Figure 3.5. The original bar numbering is used, although the score has frequent time signature shifts, unlike the Mozart and Smetana movements. Furthermore, the frequent half-bar upbeats and phrase endings led me to use half-bar resolution in my analysis.

In this movement, the orchestra is similar to Smetana's in *Vltava*. The selection of instruments is obviously defined by the needs for the Concerto as a whole. Bartok uses a Flute₃, Oboe₃, and Clarinet₃; however, these are only applied in the loud episode of bars 92-119. Apart from this section, the only significant extensions to the romantic orchestra are the second harp and the cor anglais. On the other hand, the horn section is virtually reduced to two instruments, as Horn₃ and Horn₄ are only used at the very end. The Piccolo flute is also applied only at the end of the movement.

Being familiar with the auditive expression of this movement, I have become used to thinking of it as applying the full orchestra in all main sections. I was therefore rather surprised by experiencing Bartok's sparse orchestration. In much of the movement, the instrumentation is merely strings, occasionally supported by harp(s), and 0-3 wind instruments. The brass is hardly used at all. No "real" orchestral tutti (involving the majority of members from all instrument groups simultaneously) exists. The closest to a tutti occurs in bars 92-ca.117, which comprises some 20% of the piece.

The use of the orchestral forces in this way is probably due to at least three reasons: the general inventiveness of 20th century composers with respect to timbral variation; Bartok's own preferences; and the concerto genre, here in combination with the particular character of the movement - *intermezzo interrotto*. Since the work is a concerto "for orchestra" (reminiscent of the concerto grosso genre), most instruments are given soloistic tasks, in both this and the other movements. The *intermezzo* title - even interrupted - further suggests a contrast with the surrounding movements. The orchestration, especially with the sudden shifts in the second half of the movement, can therefore easily be considered as means to enhance this character.

An example of an unconventional effect is found in bars 87-88, 106-107, and 113-114. These are the bars where the theme from Shostakovich's 7th symphony⁵ is broken off by the "laughing" orchestra. Bartok achieves the effect by only 2 flutes, 2 (3) oboes, and 2 clarinets, using the following means: second (or sevenths) intervals; some pitches stable, some chromatic descending; mixing of tone durations (eighth note triplets and quintuplets against regular quarter and eighth notes in the first instance; quarter triplets against quarter and eighth notes in the second and third cases). The fortissimo trills in the preceding bars also contribute to the effect of "chaos".

The mixing of different durations gives an impressive effect also in bars 92-95 (and partly maintained for the following seven bars). Here, a stable bass harmony and quarter note

⁵ Originally a theme by Lehar.

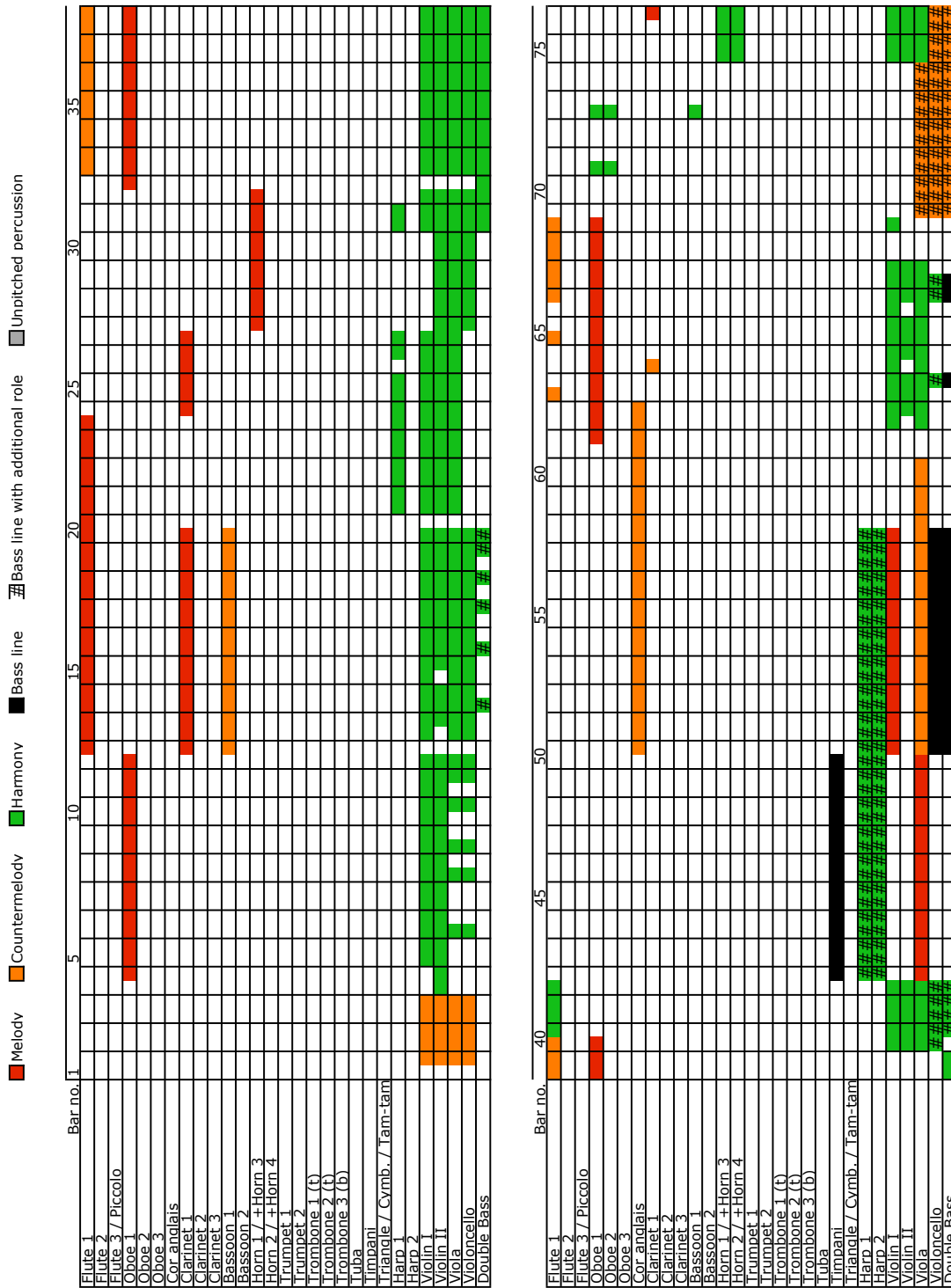


Figure 3.5: The orchestration of Bartok: Concerto for orchestra (4th movement), classified as Melody, Countermelody, Harmony, Bass line, Bass line with additional role, or Unpitched percussion.

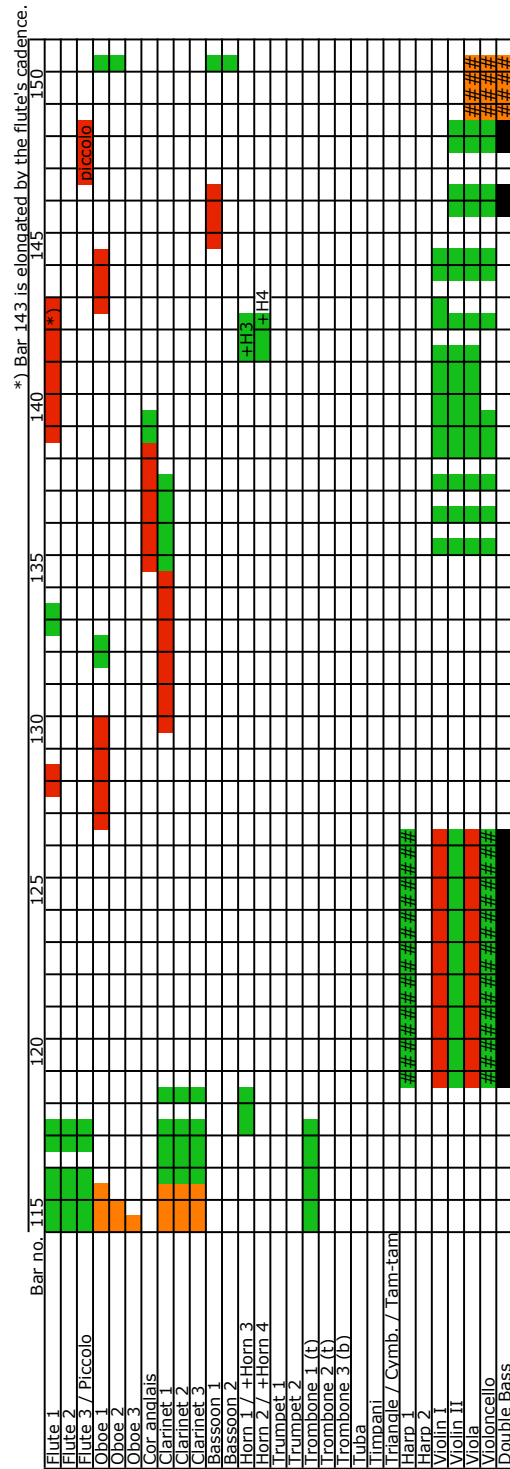
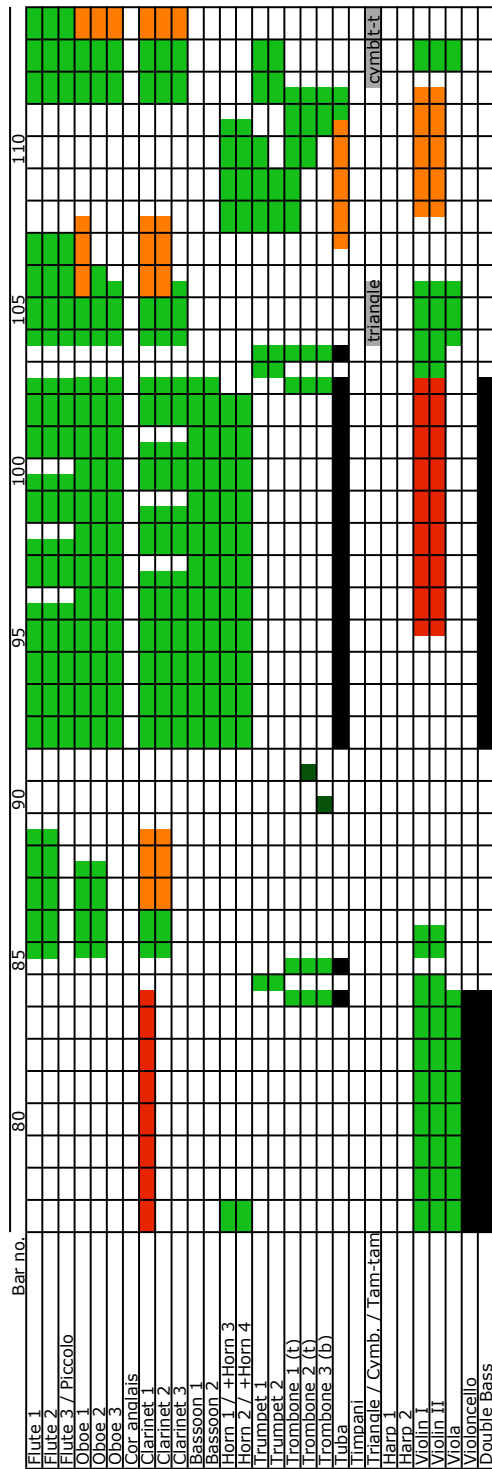


Figure 3.5 (continued).

rhythm is formed by the two bassoons, the two horns, the tuba, and the double basses. Above this fundament, the lighter woodwinds provide a churning sound made up of trills and tremolos (flutes and clarinets) and quarter note triplets (oboes). The overall effect is that of a huge orchestra creating a massive, although not static, sound block.

Other noteworthy passages, with respect to innovative orchestration, are the repetition of the first theme from bar 13, where the flute is moved down and the clarinet doubles at the octave above; the texture thinning from bar 136 towards the end; and the *Calmo* melody, first presented from bar 42 by only violas (Melody), harps (Harmony; both harps play in unison to balance the rest), and timpani outlining the Bass line. All such instances can not be described in detail here; however, the diversity and at the same time clarity of Bartok's orchestration seem to be well worth a further study.

Figure 3.6 summarizes the use of each instrument. As before, the hatched bars (Bass line with additional role) are counted together with the "additional role".

A striking feature of Figure 3.6 is the sparse use of many of the instruments, in particular the brass section. The trumpets and trombones 2 and 3 are applied in 4-7 bars each, and horns 3 and 4 only in bars 142-143. Similarly, the Piccolo flute and the unpitched percussion (triangle, cymbals, tam-tam) are used for 1-2 bars each. Since all these instruments were available for the Concerto's other movements, Bartok needed not hesitate to use them, if only for a few bars, for their particular timbre and effect.

The distribution of instruments on the four categories is also interesting: the Melody is almost exclusively presented by Flute1, Oboe1, Clarinet1, or the upper strings. If Melody and Countermelody are considered together, some more instruments are included. However, except from a few bars in Horn1 and Tuba, no brass instrument is used for these categories.

Another apparent deviation from the traditional use of instruments, is that the bassoons are not used for the Bass line. However, from the score it is clear that the bassoons have a "bass instrument role" in bars 92-103; their line just does not coincide (enough) with the "Bass line" attributed to the Tuba and Double basses, and hence, the bassoons' contribution has been classified as Harmony. Nevertheless, the doubling of the Double basses by the Tuba is itself a non-traditional combination that exemplifies Bartok's imaginative powers as orchestrator.

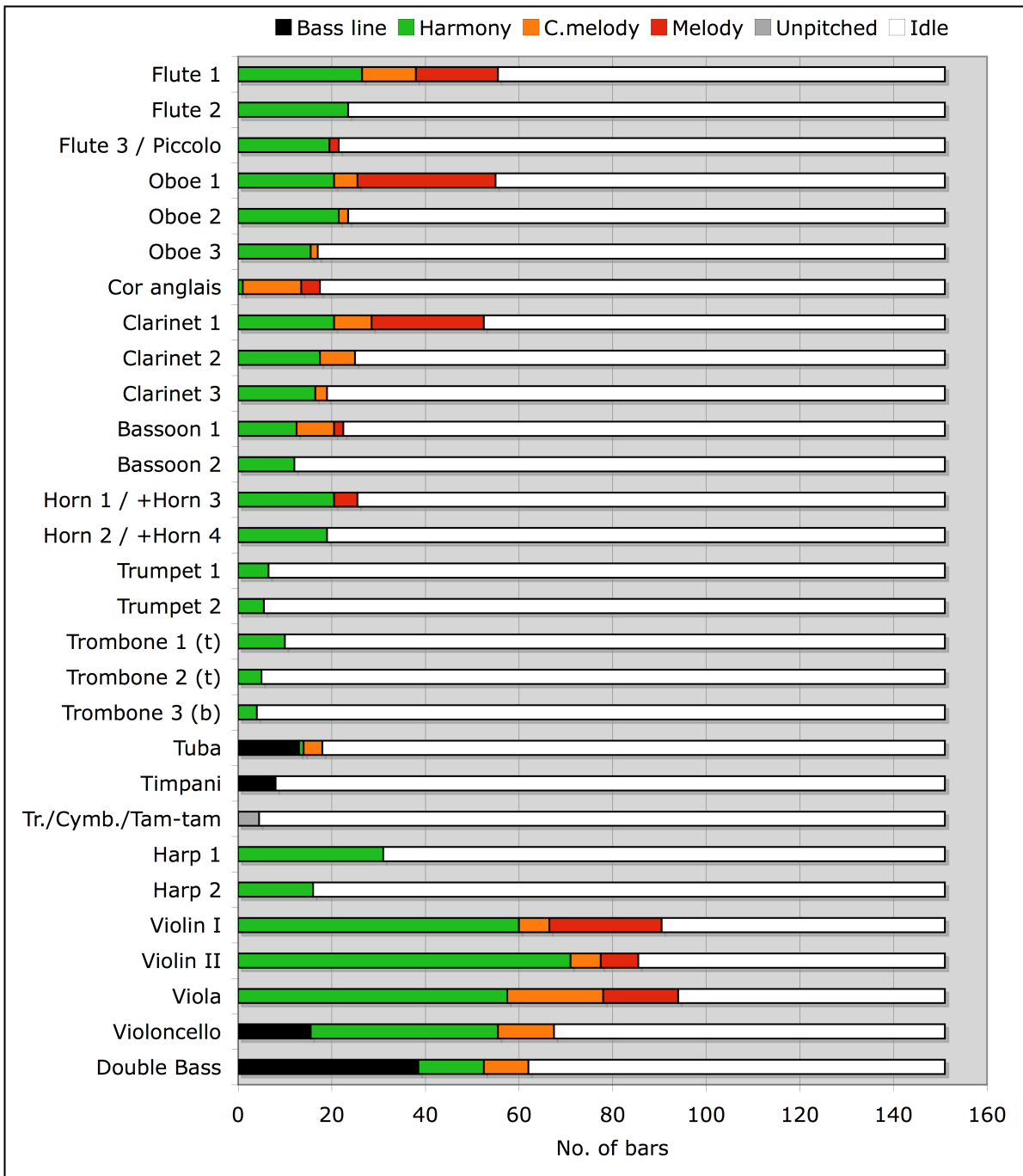


Figure 3.6: The orchestration of Bartok: Concerto for orchestra (4th movement), in terms of overall application of instruments for Melody, Countermelody, Harmony, Bass line, and Unpitched percussion.

3.5 Discussion of the Mozart, Smetana, and Bartok analyses

3.5.1 Methodology

The three works (movements) studied here are selected somewhat randomly from the thousands of orchestral scores produced over the last few centuries. Thus, although both the composers and their scores may be claimed to be "representative" of their times and styles, they still are only samples from the vast literature. This means that my study has no validity at the level of style, genre, or composer; and only within each work, it may be possible to draw valid conclusions.

My methodology has been to classify the use of instruments into four main categories: Melody, Countermelody, Harmony, and Bass line. Capital letters are used here to distinguish these categories from the usual concepts of melody, harmony, etc.⁶ I found it useful to classify Bass line as an independent element (although it may occasionally coincide with any of the other elements), since the way the bass line is distributed among the various instrument groups has great influence on the total sound balance. This makes it particularly interesting to study the orchestrator's handling of the bass voice, as a separate element.

In general, the Melody (main tune) and Countermelody (obligato) are classified according to the aural result (what a well-trained listener perceives as melodic and foreground/middle-ground elements), supported by the scores to detect, e. g., instrumental doublings. Notice that these elements do not in general correspond to theme 1, theme 2 etc. of traditional form analysis; on the contrary, one particular theme may change from Melody to Countermelody, if a new Melody takes the prominent place. The Harmony and Bass line elements are classified basically by use of the score.

The orchestral texture, as classified by for example Piston (Table 2.2), can thus be seen as a varying combination of these four elements. Table 3.1 shows this relationship.

Notice a clear distinction from Piston's use of the terms (Piston 1995, Ch. 19-25): in some of the examples, he denotes the harmonization of a melody by a parallel voice (typically a third or a sixth below, or full triad) as melody also. In my use of the terms, I restrict Melody for the actual melodic voice (and unison/octave doublings), whereas parallel voices at other intervals are, by their very nature, Harmony.

My use of four elements is motivated from the attempt to break the orchestral sound down into conceivable terms, in particular for analyzing how the instrumental forces are balanced against each other. I have not seen a methodology using these particular elements, but would be surprised if it has not been suggested before. Anyway, the four selected elements seem to be quite appropriate for the analysis purpose.

⁶ However, my categories are clearly related to two common ways of analysing layered music: melody+accompaniment, and foreground+middleground+background.

Table 3.1: *Piston's seven types of orchestral texture (ref. Table 2.2), described by my four elements: Melody, Countermelody, Harmony, Bass line.*

Texture type (Piston)	Corresponding musical elements
I Orchestral unison	Melody/Bass line.
II Melody and accompaniment	Melody, Harmony/Bass line.
III Secondary melody	Melody, Countermelody, Harmony/Bass line.
IV Part writing	Melody, Countermelody(-ies), Bass line. More or less prominent Harmony.
V Contrapuntal texture	As IV, less emphasis on harmonic element. *
VI Chords	Harmony, Bass line. If prominent voice: also Melody.
VII Complex texture	All elements. However, as Melody, Countermelody, and Bass line become more indiscernible, the classification tends towards Harmony.

* A possible confusion arises when classifying an imitating voice: is this Melody or Countermelody? With my emphasis on how the elements are aurally perceived as parts of the whole, I would tend to call this Countermelody when the overlap is significant, and otherwise Melody. Admittedly, this is no clear definition.

In addition to the classification into element category, the use of an instrument must be defined along the time axis. I have used the whole bar (Mozart and Smetana) or half bar (Bartok) as the smallest counting unit. This implies a reasonable resolution, compared to the total length of the scores, and the details that are lost, are considered to have negligible influence upon the results.

Another related feature is the inclusion/omission of phrase upbeats and ending notes when counting the bar occurrences. Upbeats and ending notes that are short compared to the one bar / half bar resolution have in general been neglected; however, the short ending notes are sometimes included, i. e., counted to the respective category. The truncation helps to clear up the diagrams, by avoiding conflicts and inconsistencies between for example melody endings and countermelody starts in the same bar. If such a bar is encountered, the most prominent of the elements determines its classification.

Sometimes, the differentiations between categories, like Countermelody vs. Harmony, or Bass line vs. other categories, is not obvious. For the Bass line, this is attempted solved by the hatching (two-colour coding) in the "score" diagrams. In the "bar count" diagrams, however, these two-category cases have been counted as the respective "other categories", i. e., not Bass line. Most of the Countermelody vs. Harmony ambiguity cases are judged as harmony, except where a clear theme is perceived. The Countermelody category has also been used for an instrumental part derived from the melody element, by for example extracting the melody's main tones.

Empty bars within a longer sequence or phrase are in traditional analysis not distinguished from the musical theme, due to continuation of the idea and musical momentum. However, they are not counted here, as this might lead to inconsistencies: empty bars might be counted when the orchestration remains the same, and not counted when the orchestration changes.

Furthermore, it seems most consistent to the objective here (analysis of the orchestral sound) to count only the bars where an instrument is actually used.

3.5.2 Comparison

Both Mozart and Bartok composed the works considered here near the end of their lives. By the composition of *Vltava* in 1874, Smetana, who was 50 years old, had completed a number of operas, symphonic poems, and other orchestral works. Thus, it is safe to say that all three works are created by well experienced composers and orchestrators, who knew their respective orchestras well.

An overall observation is that all the three orchestrations are (at least, from my rather inexperienced point of view) well crafted, i. e., they tend to support and clarify the musical structures, at the same time contributing to both the balance and the variation within each work. The structural aspect is easily demonstrated by the score diagrams (Figs. 3.1, 3.3, 3.5), where major changes to the orchestration in general occur at the boundaries between formal sections, and repeated sections are often presented in relatively similar orchestration. The latter is seen not only in the Mozart movement (similarity between exposition and reprise), but also in the Bartok example (bars 42-50 vs. 119-127; and 104-108 vs. 112-116). However, it is also clear that none of the composers have chosen the identical orchestration for repeated sections, for pure convenience reasons⁷.

These findings indicate that all three composers have succeeded in using the orchestration as a means to clarify the music (cf. Section 2.1.2).

To compare the orchestration of these three movements to textbook recommendations is a detailed and cumbersome task. I will here focus on a few general items and comment on how certain challenges have been solved by the three composers and within the respective stylistic idioms.

Table 3.2 summarizes a few facts, of which the most important feature is the number and types of instruments.

3.5.2.1 Size of orchestra

Mozart's orchestra is the typical classical orchestra, with woodwinds (no clarinet), horns and strings.

Smetana also applies the standard orchestra of his time, with full woodwind section (two of each + piccolo flute), full brass section (4+2+3+1), common percussion, harp, and strings. In

⁷ Both the Mozart and Smetana movements have identically repeated sections (bars 1-100 and 55-79, respectively). It is reasonable to assume that these repetitions have been considered as thoroughly as non-repeated sections, also with respect to the orchestration.

Table 3.2: Comparison of some features of the selected works by Mozart, Smetana, and Bartok. Durations are approximate, based on several recordings.

	Mozart: Symph. 40 (1st mvmt.)	Smetana: Vltava	Bartok: Conc. for orch. (4th mvmt.)
No. of bars	299	427	151
Duration	7'30" - 8'30"	11'30" - 13'00"	4'00" - 4'30"
No. of instruments:			
Woodwind	5	9	13
Brass	2	10	10
Percussion		4	4
Other (harp etc.)		1	2
Strings: VlnI+II, Vla, Vc, Db	yes	yes *	yes

* Vc divided

Vltava, the cellos are divided most of the time, allowing for three independent low string parts.

Bartok's orchestra is somewhat larger still, obviously defined by the needs for the other movements of the Concerto, but well within what is common in 20th century music. The extensions to the standard romantic orchestra are a second harp and additional woodwinds (3 each of flutes, oboes, and clarinets, plus cor anglais).

3.5.2.2 Variation in timbre

Considering that the number of instruments is rather limited, Mozart's variation of timbre throughout the movement is quite ingenious. Apart from the horns, all instruments are given a fair share of Melody or Countermelody (Figure 3.2), and the changes to instrument combinations occur often enough to keep the listener engaged. Of course, this effect is also due to the themes themselves and the movement's formal structure, not only to the orchestration. However, sections with constant or nearly constant instrumentation vary from 1 to only 12-14 bars, thus contributing highly to the impression of a flexible and dynamic structure.

Compared to the two other works considered in this study, the Vltava is structurally constructed from rather long episodes. This allows for long-term tension building or relaxation, typical for the romantic period. This feature is to some degree mirrored in the orchestration; Figure 3.3 shows that 12 bars or more of nearly constant instrumentation occurs rather frequently throughout the piece. This does not necessarily mean that the aural impression is monotonic: for example, in the beginning of the Mondschein episode (from bar 185), the chords regularly added by horns and harp create the necessary variation. The longest section of nearly uniform instrumentation is found towards the end (from bar 374); this section is in fact fairly monotonous in most respects, as the melody vanishes, the harmony reduces to tonic/dominant and eventually only tonic, and the rhythmic impulse

(corresponding to the shifts in harmony) slows down accordingly. However, this long relaxation section is needed to balance the preceding massive recapitulation of the main theme (bars 333-373), which itself applies a fairly constant instrumentation. Thus, this ending illustrates that a heterogeneous orchestration is not always a prerequisite for an interesting musical result.

Bartok varies by "tossing around" the themes between different instruments, and by generally using a sparse instrumentation, such that "new" (unused for some time) instruments enter with refreshing effect. The second theme, introduced in bar 42 by the violas and accompanied by harps and timpani, is a particularly beautiful example. These means for variation complies with both the overall concerto idiom of the whole work, and with the characterization (interrupted intermezzo) of this movement.

3.5.2.3 Idiomatic use of instruments; exhaustion of wind players

Judging from the printed scores, all instruments seem to be applied in their comfortable playing range, and (awkward) extremes are avoided.

Mozart requires his winds to hold a single note for up to four bars (Bassoon1 in bars 109-112; Oboe1 in bars 187-190; Horn1 in bars 241-244; both horns in bars 269-272), but this should be no problem at the prescribed tempo and dynamics. A rather long horn passage occurs in bars 153-166; the sforzatos here require the hornists to renew the breath frequently.

As commented in Section 3.3, the Vltava does have some long stretches for the woodwinds (e. g., flutes in bars 28-35; flutes and clarinets in bars 233-238). In general, however, Smetana has either divided long passages between the two equal instruments, which overlap in time and thus sound like one (beginning of work), or has provided for breathing by staccato articulation, short phrases, etc. (e. g., the Bauernhochzeit and Mondschein episodes).

As already mentioned, the instrumentation in the Bartok movement changes relatively rapidly, and this highly reduces the risk for exhaustion of the wind players. As far as I can judge from the score (and hear from many recordings), there are no really critical passages in this movement, even with the rather prominent role of especially the woodwinds.

3.5.2.4 General balance of the orchestra

This feature can only be judged by listening to performances. In my opinion, all three composers have succeeded in creating a balanced sound throughout, given the customary orchestral forces of their respective times. The perhaps most critical section in this respect is the ending of the Vltava, where Smetana employs virtually all instruments in a traditional romantic orchestral tutti; although the aural impression is rather dense and inclined towards the bass, particularly from the point where the melody vanishes (bar 374 and onwards), the balance seems fully acceptable for the movement's climax and ending.

3.5.3 *Jacob's statistical analysis*

Some further insight in the use of the orchestra can be gained from an analysis by Jacob (1982, p. 43). His results, as well as my own findings, are presented in Table 3.3.

Jacob presents numbers that show the usage of strings only, winds only, and strings and winds together in a selection of works for small orchestra (woodwind, horns, and strings) by Mozart, Beethoven, Mendelssohn, Berlioz, Wagner, and Tchaikovsky. A total of ten works are considered; however, Jacob does not specify which works or how many by each composer, and the numbers listed are total counts over all ten works.

I have extracted the same features from the three works studied here. The most interesting is of course the Mozart movement, as this is written for the same small orchestra as Jacob's samples. In the Smetana and Bartok works, I have counted woodwinds and brass together, and neglected percussion and harp; thus, it is more appropriate to interpret the heading "strings alone" as "without winds" and vice versa. For the Bartok movement, the counting refers to half bars, due to the resolution applied in Figure 3.5.

Jacob comments his own numbers thus: "... it would be the height of absurdity to lay down a rule that these proportions should even approximately be aimed at in every orchestral movement. [...] everything depends on the nature of the piece of music ..." (Jacob, 1982, p. 43).

Table 3.3: Usage of strings and winds in selected works. The listed numbers are numbers of bars (for Bartok: number of half bars).

	Total number of bars	Strings alone	Winds alone	(Sum of longest passages for strings alone	(Sum of longest passages for winds alone	Strings and winds together
Ten works for small orchestra (from Jacob, 1982, p. 43)	2912	496 (17%)	136 (5%)	134 (5%)	57 (2%)	2270 (78%)
Mozart: Symphony 40, 1st. movement	299	43 (14%)	23 (8%)	13 (4%)	6 (2%)	231 (77%)
Smetana: Vltava	427	25 (6%)	9 (2%)	7 (2%)	4 (1%)	393 (92%)
Bartok: Concerto for orchestra, 4th movement	300	50 (17%)	57 (19%)	16 (5%)	17 (6%)	190 (63%)

It is not difficult to agree with this statement. Fortunately, our task here is not to aim at anything - which might be tempting, at least subconsciously, if a piece were to be orchestrated - but merely to count the bars of existing compositions. This gives the other percentage numbers in the table. The findings can be summarized thus:

- The 40th symphony results are remarkably close to Jacob's statistics. This can be due to pure coincidence; however, it may also be argued that the wiener classic style "defined" the use of the small orchestra for (at least) the following century, to the extent that these numbers actually represent an "average". It might be interesting to pursue such a hypothesis, by carrying out the same analysis on a larger number of compositions from the wiener classic to the late romantic period. However, this is outside the scope of my study.
- Vltava has a larger proportion of "strings and winds together" than the Mozart symphony movement, at the expense of "strings alone" and "winds alone". Until further studies are available, one can only speculate whether this is a typical "trend" of the romantic period.
- Bartok's movement, on the other hand, has a smaller proportion of "strings and winds together" than the Mozart symphony movement. The corresponding increased proportion is found in the "winds alone" category. Examination of the score shows that a major contribution to this increase in "winds alone" occurs at the recapitulation of the (inverted) main theme (bars 127-135); this way of writing unaccompanied dialogues between woodwinds is not least appropriate for a work in the concerto genre. In addition, it is likely to be more common in orchestral music of the 20th century, compared to the classical and romantic periods.

It must be emphasized that the comparison of the Smetana and Bartok results with the Mozart and Jacob results is dubious, due to the changes to the orchestra. Furthermore, the comparison made above has limited practical value, due to the sample nature of the musical material. It would therefore be interesting to see a study carried out on more works, accounting for more instrument constellations in the romantic or late romantic orchestra. After all, to the degree that trends in orchestration is of interest, such trends can only be "proven" in a statistical sense, along lines similar to those suggested above.

3.5.4 Conclusions

In this chapter, I have studied the orchestration of three works from three different periods: Mozart's Symphony no. 40 (1st movement), Smetana's Vltava, and Bartok's Concerto for orchestra (4th movement).

Following the guidelines of Walter Piston (Section 3.1), I have investigated how the musical elements Melody, Countermelody, Harmony, and Bass line are distributed among the instruments. From the resulting "score" diagrams (Figures 3.1, 3.3, 3.5), statistical measures like the number of bars in each category can be extracted, that reveal the use of individual instruments, as well as occurrences of various constellations of instruments.

This approach has limited value when applied to individual music works. However, after necessary adjustment and refinement, the method may be applied to a larger group of compositions, along the lines presented by Gordon Jacob (1982, p. 43). This may reveal both individual composer styles, and period styles, with respect to orchestration techniques.

Due to the limited material considered here, no conclusions can be drawn at the level of period or composer style. Comparing the three works, the main observations are:

- All three orchestrations are made by experienced composers, who knew their respective orchestras well. An overall feature is that the orchestrations contribute to clarify the musical structure, while at the same time creating both balance and variation in the respective works.
- Mozart's orchestration is heterogeneous and provides much variation in spite of the limited forces of the Wiener Classic orchestra.
- Smetana's orchestration mirrors the longer lines of his symphonic poem's structure.
- Bartok's orchestration is less dense than the other two, and changes according to the more episodic character of his composition ("multi-soloist concerto", and (interrupted) intermezzo).

The major personal yields from this study are valuable training in both score reading and dedicated listening, as well as improved sensitivity for and understanding of the use of the orchestra. Furthermore, the comparison of three works from quite different stylistic periods have provided a fairly broad view of the possibilities that lies in the art of orchestration.

4. The orchestration of Kreisleriana

4.1 Background - why Schumann's Kreisleriana

Being an amateur pianist myself, I have since long been familiar with Robert Schumann's opus 16, Kreisleriana, composed for the piano in the spring of 1838. These eight Fantasies comprise a great variety of moods, as well as considerable technical demands, all within the idiom of the typical 19th century romantic piano virtuoso.

The work's variety, and the colourful layout and texture throughout, seem to be well fit for orchestral adaptation. It was this realization, together with my knowledge and appreciation of the work as a substantial opus of the romantic piano literature, that inspired me to choose the Kreisleriana for my attempts in orchestration.

4.2 The Kreisleriana movements (piano version)

The piano score used here is the Urtext edition published by G. Henle (Schumann, 1975).

My analysis of the work comprises all eight movements. However, the orchestration has been limited to movements 1, 6, 7 and 8.

4.2.1 A note on bar numbers

My referencing to bars in the Kreisleriana piano movements follow exactly the bar numbering in my edition. The editor's numbering, however, does not count repeated bars or 1st ending bars. Repetition of sections occurs in all but movements 4 and 6.

In my orchestrated scores, the automatic bar numbering by the Sibelius software applies throughout. This may give bar numbers differing from the piano score, in particular where I have written out repeated sections due to changes in instrumentation.

Hopefully, it is clear from the context whether the bar numbering refers to the piano score or to the orchestration score in the following.

4.2.2 Form

The form of each Kreisleriana movement is somewhat freely conceived, as appropriate for a set of "Fantasies". However, the overall structures are fairly easy to grasp, due to the clear sectioning. One movement typically has two or three main themes, which are combined either in ternary form (e. g., movement 1, 4), or in more complex ways, involving variation,

transition sections or codas (e. g., movement 2, 7). This is at the highest structural level, and more thematic and motivic material can be identified if the analysis is taken to more detailed levels. However, this will not be pursued further here.

One typical feature, however, is that all movements display two or more mutually contrasting sections. At the same time, at least three techniques are used to create unity within each movement:

- Repetition of section:
 - identical repetition of whole section; this occurs in most movements.
 - in movements 4 and 6, the section repeated at the end is a shortened version of the principal section.
- Development of melodic/thematic material, exemplified by:
 - the variation of the main theme of movement 2, towards the end of the movement.
 - the development of the lyric second theme of movement 3.
 - the middle section (bars 51-93 in the piano score) of movement 5.
 - the development of the fugato theme in the middle section of movement 7.
- Equality or similarity of rhythmic figures throughout otherwise contrasting sections, exemplified by:
 - the eighth note triplets throughout movement 1.
 - the first theme and the coda of movement 3.
 - the punctuated rhythm running through the whole of movement 8.
 - the development (from bar 5) of the initial, punctuated rhythm of movement 5.
 - the similar rhythm (although at different intensity and character) of the beginning motif and the "Etwas bewegter" section of movement 6.

As far as I have observed, no musical idea has been used in more than one movement; thus, there is no obvious linking element between the various movements of the Kreisleriana.

4.2.3 Texture

I have attempted to analyze the textures of the Kreisleriana movements. I have then applied the texture types of Piston (Section 2.2.3), and divided each movement into sections of rather homogeneous texture. Therefore, although the sections are denoted A, B, A', etc., the sectioning itself is based on texture and not on the thematic/melodic material. The sectioning may thus differ considerably from traditional form analysis.

Table 4.1 presents the result of this texture analysis. For simplicity, I repeat Piston's categories here:

I	(Orchestral) unison
II	Melody and accompaniment
III	Secondary melody
IV	Part writing
V	Contrapuntal texture
VI	Chords
VII	Complex texture

My classification shows that type II (Melody and accompaniment) is the most common texture type. This type is used in all movements; in movements 1 and 8 almost exclusively,

Table 4.1: Texture types according to Piston's classification (see Section 2.2.3), for various sections of the Kreisleriana movements. Bar numbers refer to the piano edition.

Mvmt. (key)	Section *)	Bars	Section key	Texture type	
1 (d minor)	A	1 - 24	d minor	II	
	B	25 - 48	Bb major	II	
	A	49 - 72	d minor	II	
2 (Bb major)	A	1 - 37	Bb major	II, III	
	B	38 - 54	Bb major	V	
	A	55 - 91	Bb major	II, III	
	C	92 - 118	g minor	V (or III)	
	transition, hints of A	119 - 142	modulating	IV, II	
	A'	143 - 167	Bb major	II, III	
	coda	168 - 173	Bb major	VI, II	
3 (g minor)	A	1 - 32	g minor	II, some III	
	B	33 - 84	Bb major + mod.	III, II	
	A	85 - 115	g minor	II, some III	
	coda	116 - 156	g minor	II	
4 (Bb major)	A	1 - 11	Bb major	II, some III	
	B	12 - 33	g minor (?)	II (III or V also possible)	
	A'	34 - 38	Bb major	II	
5 (g minor)	A	1 - 14	g minor	II, V	
	B	14 - 37	modulating	II (some V)	
	A	38 - 51	g minor	II, V	
	C	51 - 68	g minor + mod.	VI, I	
	transition	69 - 93	modulating	II	
	C'	93 - 105	g minor	VI, I	
	B	105 - 127	modulating	II (some V)	
A	128 - 141	g minor	II, V		
6 (B major)	A	1 - 5	Bb major + mod.	II	
	B	6 - 10	modulating	V	
	A'	11 - 18	Bb major	II, V	
	C	19 - 34	Bb major	II	
	A''	35 - 39	Bb major	II	
7 (c minor)	A	1 - 8	c minor	II (accomp. partly VI)	
	B	9 - 32	g minor	II	
	A (transp.)	33 - 40	g minor	II (accomp. partly VI)	
	C	40 - 52	c minor	V	
	C'	53 - 68	modulating	V, II	
	B'	69 - 80	c minor	II	
	A	81 - 88	c minor	II (accomp. partly VI)	
	coda	88 - 116	Eb major	VI (or IV, but varying number of voices)	
	8 (g minor)	A	1 - 8	g minor	II
		A'	8 - 24	g minor	II
B		24 - 48	Bb major	II	
A''		48 - 72	g minor	II	
C		72 - 112	modulating	II (accomp. of type VI)	
A'''		112 - 145	g minor	II	

*) The sectioning was done by me for the purpose of texture classification, and may thus differ from established form analyses of the Kreisleriana.

and dominating in the other movements. Of the other texture types, III and V (which may be rather similar) are used to some extent, and I, IV, and VI only at rare occasions. I found no textures of the complex (VII) type.

Although my classification may be disputed, it seems fair to conclude that the dominating texture in Kreisleriana is one or two melodic lines with accompaniment, the latter sometimes developing into polyphonic texture with or without accompaniment, and that chordal or part writing is used far more sparsely.

4.2.4 Keys

Table 4.1 also shows the keys of the movements, and of the sections introduced by my texture analysis. All major sections are in keys with 1-3 flats, i. e., keys that are well suited for wind instruments, and not too cumbersome for strings. From this observation, and from the basic principle that diversion from the original requires strong justification, I have kept the original keys in my orchestration.

4.3 My orchestration

4.3.1 General approach

Being rather unfamiliar with orchestral writing in general and Schumann's symphonic scores in particular, I have considered it too ambitious to attempt an orchestration similar to what Schumann himself might have done. My goal was to achieve an instrumentation and orchestral sound typical for the romantic period. As a consequence, I have applied the standard romantic orchestra, although this may relate more to the late 19th century than to Schumann's own time (early/mid 19th century).

The instrumentation that I have used in the Kreisleriana movements is listed in Section 4.3.3.

One guiding principle has been to keep as close as possible to the original text (Schumann, 1975). As already mentioned, all movements have been orchestrated in the original keys. Furthermore, it goes without saying that harmonies, melodic lines and part writing, tempi, and overall dynamics, articulation, and expression should be rendered as close to the original as possible. However, this does not necessarily mean that in particular the piano articulation can be copied directly into the orchestral score. Furthermore, when it comes to sound nuances and balance and clarity of the orchestra, there is no help to be found in the piano score. Thus, my aim was to furnish these pieces with the colours and timbres offered by the romantic orchestra, without disturbing the structure, harmonies or character of the work.

4.3.2 *Transcription challenges*

4.3.2.1 Sustained harmonies, broken chords, harmonic ambiguity

I have tried to follow Schumann's own part writing closely. However, it could not be neglected that some passages are harmonically incomplete or ambiguous. I will show some examples of this.

In the beginning of the first movement (the first eight bars), the harmonic progression is fairly easy to analyse. However, when the off-beat bass is merely an octave, an ambiguity arises. For example, on the second eighth note of bar 7 (see Figure 4.1), the bass chord is obviously Eb major. At the parallel place in bar 3, however, the only notes sounding⁸ are G and Bb, which may suggest both a G minor chord and an Eb major chord. The right hand plays the same triplets in both cases. To find evidence of Eb major in bar 7's right hand figure, we have to look at the triplet preceding the chord. However, at this point, the bass chord is D⁷, supporting the last eighth note of bar 6 (since the chord is notated as a full quarter note, but staccato, there is also a question as to how long it should actually sound).

In bars 2-3, the D⁷ is less explicit: the chord might as well be the diminished seventh F#-(A)-C-Eb, if the D is considered to be a passing note. In this interpretation, the Eb helps defining the diminished chord, instead of (merely) anticipating the next chord. Thus, the Eb major chord on the second eighth note of bar 3 is not as implicit as that of bar 7.⁹

A similar place, which by incidence involve the same chords, occurs in movement 3 (Figure 4.2). The chord on the first beat of bar 122 (7th bar of the *Noch schneller* section) is just G-Bb, preceded by a sequence of diminished chords ending on a D⁷. This suggest that the chord in question is G minor. Four bars later, the G minor is felt even stronger, as the harmonic progression can be seen as a IV-V-I cadence. The G minor would also add harmonic excitement to the passage, as it is immediately followed by Eb major.

In both these examples, the ambiguous interval (G-Bb) may thus be part of either a G minor chord or an Eb major chord, depending on whether the cadence is interpreted as authentic or deceptive. However, it is only in one case (1st movement, bar 7) that the Eb major is explicitly stated by Schumann. Thus, for the other occurrences, I consider it wrong to "interpret" the chord in one way or the other, by adding D or Eb, respectively.

⁸ Due to the pedalling, several notes actually sound at this moment; however, the pedalling must obey to the harmonies and not vice versa. The functional analysis therefore should come first.

⁹ One might argue that the parallelism itself between two sequences allows one to apply the (unambiguous) results from one place at the other (ambiguous) place. However, I find this practice somewhat controversial, at least, since it may lead to doubtful chord solutions that the composer never intended. After all, complete removal of all ambiguities should not be a goal in itself, when art is concerned.

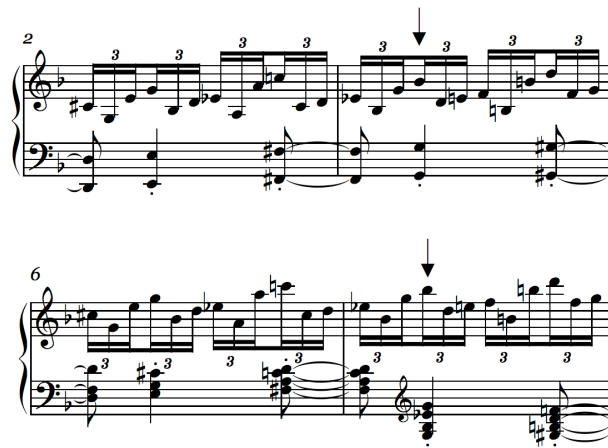


Figure 4.1: Kreisleriana (piano score), movement 1, bars 2-3 and 6-7 (from Schumann, 1975).



Figure 4.2: Kreisleriana (piano score), movement 3, bars 121-122 and 125-126 (from Scumann, 1975).

However, there are other places where such an interpretation definitely is necessary due to the piano-writing texture. For example, the soft middle section of movement 1 needs a stable chordal support throughout; fortunately, this can easily be derived from the broken chords. The same is the case with the beginning bars of movement 7, once it is realized that the low G is in fact an organ point and that the harmonic progression is actually distributed from the tenor voice and upwards, partly as broken chords in the right hand.

A less obvious case is the first interlude of movement 8 (from bar 25 in the piano score). The character of this section, and the lack of an orchestral equivalent to the sustain pedal, call for

full harmonies at each main beat. These chords must then be derived from the leaping right hand figures. However, at first glance, the harmonies spelled out by these figures seem to be rather inconsistent at the end of the bar (last eighth note of 2/4 rhythm), sometimes corresponding to the established harmony of the bar and sometimes not.

Here is my analysis of this section, using the 2/4 time signature of the bass line as rhythmic reference: There are obviously two elements: melody (bass line) and accompaniment (leaping figures), the latter realizing the harmonization of the melody. The harmony established in the bar's first half is in fact valid for the whole bar. This can be realized by playing through the piano score and extending the harmony over the whole bar; this will sound perfectly legitimate. But Schumann has chosen to anticipate the harmony of each new bar by one eighth note beat; thus, the harmonization precedes the melody by one eighth note throughout the section.¹⁰ This is most easily seen in bars where accidentals show the anticipation of a modulating chord.

With this insight in the harmonic progression, it is easy to extend every note in the leaping right hand figures with notes from the correct triad or seventh chord, as a means to build a thicker accompaniment texture.

By similar analyses, it is possible to resolve most of the harmonic ambiguities in Schumann's piano score. My guiding principle has been to draw benefit from such results to enhance the richness of the sound, especially in cases where one needs to compensate for the lack of the piano's sustain pedal. On the other hand, if the ambiguity can not be satisfactorily resolved, as in the examples from the 1st and 3rd movements discussed above, I prefer to leave the ambiguity as it is, even when other options can be argued to be "improvements".¹¹

4.3.2.2 Note duration, articulation, phrasing

Although the meanings of various articulation markings are fairly well defined, there certainly exist nuances and interpretational differences between instruments. For example, on the keyword "staccato", *The Oxford Dictionary of Musical Terms* (Latham, 2004, p. 175) explains:

¹⁰ That the anticipation is not two eighth notes can be seen for example in the first bar of the section (bar 25): The harmony of this bar is Bb major, and that of the next bar Eb⁶ major. The D in the right hand at the third eighth note obviously belongs to the first of these chords, thus defining the first three quarters of the bar as Bb major. (Interpreting the D as being part of some kind of g minor chord in the last half of the bar is definitely a mistake - playing a g minor chord at the third eighth sounds peculiar, and the bass melody's D (and C) is clearly a passing note, unrelated to the harmony.)

¹¹ I use quotation marks to indicate that what is considered as "improvements" will always be subject to changes in fashion and taste; one example - with no other connection to my text - is Rimsky-Korsakov's re-orchestration of Mussorgsky's operas.

"[...] The degree of detachment [between succeeding notes] varies according to the type of instrument in question and the style and period of the music."

Thus, the articulation and phrasing, and in some cases even note durations (e. g., pizzicato notes), should in principle be carefully considered.

As a general rule, I have chosen to transfer the markings from Schumann's piano score to the instrument in question, wherever such a marking seems adequate and reasonable. When multiple solutions appeared as possible, I have tried to imagine how the execution of various performance markings would work and sound. In these attempts, I have found my supervisor's advice to pretend playing an imaginary instrument very useful. In particular, slurs that indicate the bowing solutions for the strings and the legato phrasing of the winds, have been "tested" in such imaginary playing, as the slurs in the piano score in many cases do not easily comply with a comfortable playing technique of other instruments.

I have denoted accents by > (attack accent) and – (tenuto accent), and sometimes by *sf* (sforzando), in compliance with Schumann's own practice. The same holds for the staccato sign, and combinations of these articulation signs. When it comes to adding signs that are not in the piano score, or changing slurs as mentioned above, I have been rather restrictive, partly because of my aforementioned unfamiliarity with the instruments. However, as the work progressed, my supervisor's advice has encouraged me to introduce such changes, whenever this might help clarifying the musical intentions to the musician.

In a few cases, I have made changes to the original score. The dual time signature (2/4 for the left hand and 6/8 for the right hand) in the first intermezzo of movement 8 is actually superfluous, as both rhythms can easily be written (and conducted and played) with 6/8 as the common time signature. Furthermore, the opening of movement 7 invites for appoggiaturas (which are actually necessary on the piano, due to large chord spans); I have rendered these as simultaneous chords to sharpen the attack.¹² The upbeat triplet, however, is of course preserved.

4.3.2.3 Timbre and balance

The choice of orchestral colour, and the balance between instruments, has of course been a major concern. This is also at the core of orchestration, where the skills and creativity are fully challenged and exposed. My approach is described in the following.

I have attempted to determine the "characteristics" of a melody or a section, and tried to imagine how this would sound using various instruments. For the melody, the basic choice was between the orchestral groups woodwinds, brass, and strings. For example, the beginnings of movements 1, 3, 5, 7 and 8 are, to various degrees, light-hearted and capriccioso, at least compared to the other movements. Thus, for all these movement openings, my initial choice would be woodwinds as the primary melodic instrument. The

¹² This choice was directly inspired by Ravel's handling of a similar case (The great gate of Kiev) in Mussorgsky's "Pictures from an exhibition".

more quiet openings of movements 2 and 6 seem to me more fit for brass, in particular horns.

The further choice of instrument(s) (within an orchestral group) was determined by the melody's register, and the ability of the instrument to play with the necessary agility, flexibility, and tone quality. This led, for example, to the choice of clarinets for the beginning of movement 1, and clarinets plus flutes for the beginning of movement 8. This is described in more detail in the sections on each movement.

The accompaniment then had to match the chosen melodic instrument(s). The combination of bassoons, cellos and double basses is well-sounding and well-balanced over the whole dynamic range, and this accompaniment section is thus frequently considered as the primary choice for the bass.

When it comes to harmony, a general principle recommends that the full harmony should be present in each orchestral section (woodwind, brass, strings). In particular, Gordon Jacob (1982, p. 78) states:

"In laying out passages for woodwind and brass care should be taken that no essential notes of the harmony are omitted from the brass group. The woodwind can only be used for doubling notes which are already present in the brass."

I have tried to adhere to these principles, without making them so rigorous that deviations are not allowed. However, Jacob's claim about the brass group seems well founded. It can be seen from my scores that I have tried to explore the brass group for accompaniment, in the soft dynamics of *ppp-p*. It is logical that this group should then provide the full harmony, since the brass sound does not blend too well with the other instrument sections.

The same principle of full (accompanying) harmony within a section is also applied for the strings, and, to some degree, for the woodwinds. My slight hesitation in using the woodwinds for accompaniment is due to the group being less homogeneous than strings or brass, with more individualistic sound profiles. On the other hand, there is no particular reason for directly avoiding the well-balanced woodwind (and horn) chord as accompaniment, when this appears as a satisfying solution.

4.3.2.4 Orchestral effect and variation

In the further development of the orchestral score, I have applied considerations like those mentioned above, along with an eye on the principles described in Sections 2.1.2 and 2.3, and more detailed advices found in the textbooks.

For example, in movement 1, I have attempted to write the opening crescendo (bars 1-8) into the score by adding instruments, and used the same method to enhance the effect further at the end of the first part (bars 17-24), where the full orchestra including xylophone seems adequate. The softer middle section has a completely different character, which calls for a corresponding change in orchestration. This is described in more detail in Section 4.3.4.

Variation in orchestral sound is another concern, both between the movements, and within each movement. At the highest level, the structural sections of the Kreisleriana movements are generally rather long, and often with repetitions (e. g., the middle section of movement 1). Therefore, the orchestration needs to provide enough variety that such repetitions are not boring. For this purpose, I have in most cases written out the repetitions completely, with changes in the instrumentation. I have also varied the instrumentation at shorter intervals (e. g., phrases of length 4 or 8 bars) for the same reason.

4.3.2.5 Idiomatic and instrument-specific writing

The original score is fairly idiomatic for the piano and the pianist. However, I did not find it particularly difficult to imagine how the music could be realized on other instruments¹³.

I have in general tried to avoid using the extreme registers of any instrument. I have paid particular attention not to challenge the highest registers of the wind instruments, due to both the technical difficulties for the musicians, and the inherently thinner and shriller sound associated with the upper registers. However, this concern may have lead to an overly cautious writing, in particular for oboes, clarinets, and horns, since my basic knowledge on this topic comes from textbooks and not from experience.

For the strings, I have mainly written for *divisi* playing rather than double or triple stops, as neither the music itself nor the voicing called for the more virtuoso latter effect. Furthermore, the piano score does not call for large leaps, and hence the strings do not need to execute them either. Of special playing techniques, the string parts call for both *pizz* and *arco*, hopefully with enough time to change between them, and also for *col legno* in movement 6.

I have attempted to write the winds' parts such that there is enough time to breathe in, and, particularly for the oboe, to breathe out excess air. This is realized through pauses, and, when long, continuous sections could not be avoided, by changing between instrument I and II of the same kind.

The harp is used for broken chord figurations in movement 1. I have paid special attention to the harp part, to make sure that the suggested pedaling can actually be executed.

4.3.2.6 Concluding remarks

Some more details on specific challenges and solutions are included in the descriptions of the individual movements (Section 4.3.4). However, it is impossible to comment on all options and choices. Instead, I would like to state that in general, there is a clear intention behind the solutions I have chosen for the orchestration. These intentions are founded in my conception of the music, and in an idea of how this conception might be realized by the orchestra.

¹³ My own abilities to play wind or string instruments are limited to little more than searching out the scale on a recorder or a violin; however, this still gives me a basic understanding of the respective playing techniques.

4.3.3 Realization of orchestral score

I initially created drafts of all movements, often working on several movements at the time. These drafts were finished in the order: movement 6, 5, 8, 7, 1, 4, 2, and 3.

My first drafts included:

- Notes and parts distributed among the orchestral instruments.
- Dynamics.
- Most articulation signs (staccato, accent, tenuto).
- Only few phrasing slurs.

It should be mentioned that the note duration, slurs, and articulation signs of these first drafts followed the piano score rather closely, without too much attention to how it would sound from an orchestra. However, some concerns like muting and reduced dynamics were made for the brass section in these first drafts, for better dynamic balance.

My revised drafts, which are the versions presented here, incorporate:

- Advices from my supervisor.
- Rethinking of choices of instruments, including improving the balancing.
- Inclusion and correction of slurs and articulation signs to clarify the musical intentions (hopefully to the benefit of the musicians). However, I have left to the string groups' leaders to figure out the upbeat/downbeat signs.

The advices from my supervisor were of all kinds, from overall orchestral balance to specific details on articulation etc. These advices generally suggested various ways of improvement, leaving me with several alternatives to choose among. Thus, the responsibility for all awkward solutions in the final versions still lies with me.

Finalized versions have been prepared for movements 1, 6, 7, and 8, and these are the scores included as Appendices A, B, C, and D, respectively. The instrumentations of these final versions are shown in Table 4.2.

The scores are created in the music notation software Sibelius, version 6, on a Macintosh computer. This software was crucial for the task of completing and editing the scores efficiently. Sibelius also offers playback of any implemented score; however, due to a medium-quality sound database, ditto sound card, and general processing speed limitations related to administering and mixing many instruments, the output of orchestral sound was not very impressive. This implies that in particular the orchestral balance could not be evaluated properly from the playback.

All transposing instruments are notated as they sound, i. e., in C.

Notice also that the metronome marks are my own (Schumann's piano score suggest metronome settings only for movements 4 and 6); these were added only to render a realistic playback of the score from Sibelius.

Table 4.2: The instrumentation of Kreisleriana movements 1, 6, 7, and 8.

Movement	1	6	7	8
Piccolo flute	x *			
Flute I	x *	x	x	x
Flute II	x	x	x	x
Oboe I	x	x	x	x
Oboe II	x		x	x
Clarinet I in Bb	x	x	x	x
Clarinet II in Bb	x		x	x
Bass clarinet in Bb		x	x	
Bassoon I	x	x	x	x
Bassoon II	x		x	x
Horn I in F	x	x	x	x
Horn II in F	x	x	x	x
Horn III in F	x		x	x
Horn IV in F	x		x	x
Trumpet I in Bb	x	x	x	x
Trumpet II in Bb				x
Trombone I	x	x	x	x
Trombone II	x	x	x	x
Trombone III	x		x	x
Bass trombone			x	x
Tuba	x			x
Timpani		x		x
Triangle	x			
Xylophone	x			x
Harp	x			
Violin I	x	x	x	x
Violin II	x	x	x	x
Viola	x	x	x	x
Violoncello	x	x	x	x
Double bass	x	x	x	x

* In movement 1, the same flutist is supposed to play the Piccolo and the Flute I.

4.3.4 *Comments on individual movements*

4.3.4.1 **Movement 1**

See Appendix A for the final version of the orchestral score.

One option for instrumentation of the first eight bars was strings, which would be able to carry out the whole ascending line as one sweeping motion without noticeable register changes. However, this idea was abandoned because the overall sound might be a bit muddled. I preferred the clarity and agility of the woodwinds and found that the necessary register changes from clarinets to oboes and flutes actually might add spirit to the line.

The very first note (upbeat) is ambiguous in the piano score, as it is rendered as an ordinary sixteenth note. The same note value is found at the beginning of the middle section; otherwise, all upbeats (including the recapitulation start) are triplets. Assuming that these apparent sixteenth notes are not meant literally, I have altered all upbeats to triplet notes.

When subdividing the opening phrase into 6 triplet notes, as I did due to freshness of breathing for the winds¹⁴, an interesting question occurs: Should the division (after the very first notes) be 2 upbeat triplets plus 4 following, or only 1 upbeat triplet plus 5 following? These two options are depicted in Figure 4.3b and c, respectively.

Following my supervisor's advice, the solution turned out to lie in the articulation of the phrase. Figure 4.3a shows the original notation of the Henle piano edition. My first priority was to preserve the accents at every eighth note. However, on wind instruments, such accents require a tongued attack, and the legato slur from the previous triplet note must therefore be discarded.

With the piano slur removed, I had to determine a new phrasing of the motif. In order to preserve the long-term build-up of the phrase, I decided on the legato binding of the whole triplet within one eighth note shown in Figure 4.3d. This can not be fully realized if the phrase is to be divided between two instruments (unless the division is at each eighth note, which is a solution that might counteract the forward momentum); thus, I found the division shown in Figure 4.3b (and the articulation in 4.3d) to be the best realization of my intentions. The same articulation is later applied to other wind instruments, and to the strings.

The above discussion illustrates the kind of considerations that may be necessary to solve a seemingly simple task. Fortunately, most decisions do not require this level of detailed reasoning.

¹⁴ Whether the division between instruments should be into phrases of six or twelve notes is more or less a matter of taste. My solution has been to use six-note phrases in the beginning, where harmonies change rapidly and the character thus is restless, and twelve-note phrases from bar 9 and onwards, where the harmonies and accentuation suggest more of a whole-bar phrase period.

a)



b)



c)



d)



Figure 4.3: Options for articulation and division between two instruments (clarinets) for the first bars of Kreisleriana, movement 1:

- a) Notation in G. Henle's piano edition.
- b), c) Two ways of dividing the passage between two instruments, with articulation omitted.
- d) The solution decided on in my orchestration. The chosen phrasing is incompatible with the division shown in c).

Having decided for woodwinds in bars 1-8, supported in the crescendo by strings and horns, it was natural to apply fortissimo strings in the following triplets (from bar 9) and bassoons and brass in the sustained chords. Brass instruments (trombones) seem especially suited for the sforzato dissonances in bars 13-14. The recapitulation (bars 17-24) is scored with a greater crescendo than the opening, and with the xylophone added at the end for brilliance.

In the middle section, the character of the music changes abruptly into more pastorale or “fairy-like”. In my imagination, the harp seems quite ideal for the broken chords. The harmonies then need to be supported as lasting chords, and I used strings for this.¹⁵ The melody, which actually is not outlined as a single voice by Schumann, is given to the flute, and a triangle is added to enhance the atmosphere further.

However, this instrumentation should not be kept too long, as it will tire the listener, no matter how delicate it is. The middle section is naturally divided into phrases of length 4 bars, and it is thus highly appropriate to change the orchestration at these phrase endings. As can be seen from the score, my choice has been to alter the melody between flute, clarinet, oboe, and muted trumpet, and the accompaniment between harp and clarinets (broken chords), and between strings, brass, and bassoons (sustained chords). The whole middle section thus alternates between these combinations, which all are intended to provide a softer contrast to the outer sections.

Finally, the repetition (bars 73-96) is orchestrated identically to the beginning (bars 1-24).

4.3.4.2 Movement 6

See Appendix B for the final version of the orchestral score.

I consider the character of this movement to be rather chamber-like. This conception, and the general texture of “melody plus accompaniment”, has led me to a more soloistic use of the instruments than in the other movements.

With my orchestration, I attempt to create a solemn atmosphere for the first theme (bars 1-5, and returning in bars 11-18 and bars 35-39). Thus, I have assigned the opening motif and its answer to the horns (normal and muted). Both this main theme, and, in particular, the first “intermezzo” (bars 6-10) invite for soloistic use of most of the wind instruments, and some soloistic string passages as well.

For timbral reasons, I have chosen a bass clarinet instead of a second bassoon. The use of the bass clarinet in soloistic phrases (bars 7 and 11) and as part of the woodwind harmony (bars 15-16) should be unproblematic. However, the use in the low register, either at soft dynamics (bars 1-2, 8-9, 17-18, 35-36) or to add “bounce” (bars 27-32) is probably more unconventional - having a bassoon² playing these parts would of course be a more traditional and thus safer solution.

The rhythm in the accompaniment of the second “intermezzo” (bars 19-34) requires some consideration. The accents in the piano score seem to serve basically as impulses for the melodic phrases, and the punctuated triplets have not been given any consistent accent

¹⁵ I also considered using celesta for the chords, in addition to the strings, but found it superfluous. Besides, since the celesta was invented in 1886 (Schepelern, 1974, p. 115), it would be dubious in this “standard” romantic orchestra, and definitely anachronistic for Schumann’s times.

marking. Thus, the normal way of playing the accompaniment rhythm would be to place the down-beat stress on first eighth note, followed by two weak (up-beat) notes. This is of course an entirely legitimate interpretation.

However, I feel that this reduces the rhythm to a somewhat heavy or laid-back waltz, whether this accent occurs twice or only once in each bar. In my opinion, there is more excitement hidden in this “intermezzo”. This view is in particular based on the melody’s constant struggle upwards, and the overlap of the two large-scale phrases in bars 26-27, which truncates the first phrase to 7 bars. Thus, the melody seems to have a somewhat “restless” character to me. This excitement or “forward momentum” should therefore be reflected by the accompaniment, notably by accentuating the punctuated sixteenth note and the last eighth note of the triplet. These accents should not be over-emphasized, but rather provide the constant impulses that push the music forward and keep it “on its toes”.

I have tried to realize this in my orchestration. Initially, I considered emphasizing the rhythm by doubling the punctuated note and the last eighth note by some unpitched percussion instrument like the wood block; however, I found that this probably would steal too much of the attention – as well as being anachronistic. The solution I have chosen, is to first provide the impulses by soft accents in muted brass (the clarinet plays the melody; bars 19-22), then assign these accents to pizzicato strings under the oboe’s melody (bars 23-26), and finally using the trumpet (muted, but moderately loud) for the melody accompanied by the accented rhythm in flutes and arco strings, some of the strings playing *col legno* for the special percussive effect (bars 27-33). At the same time, from bar 27, the bass clarinet and bassoon join in to give the punctuated rhythm more substance and “bounce”. In this way, the accompaniment hopefully supports both the forward momentum and the associated crescendo that I consider to be inherent in this passage. However, I am aware that my interpretation may be disputed, and that the intentions may surpass the realization.

4.3.4.3 Movement 7

See Appendix C for the final version of the orchestral score.

The boisterous opening of this movement puzzled me for some time: would it feel right to apply the winds for this beginning? The bright woodwinds like oboe, flute, and piccolo might give the desired sting for the accented chords, but the supporting chords themselves might be difficult to balance against this, as they need both weight and clarity. When I finally decided on strings for the opening motif, it occurred to me that the whole movement was ideally suited for strings, and that winds should be used for variation and highlighting of melodic features. In this way, movement 7 would become the “show-piece” of the string section.

Playing the initial chords *appoggiatura* is effective on the piano. However, to render a crisp attack and a clear upbeat, I found it better to avoid *appoggiaturas* in the orchestra. The first presentation of the theme is for strings only; later, I support each beat of the theme by brass and eventually also woodwind chords.

The second theme (from bar 17) has a lighter and more playful character. The lower strings and the bassoons provide the fundament, i. e., the two-beat rhythm and the accompaniment’s

sixteenth note figure; however, the oboes and clarinets appeared ideal for the merry melodic phrases. To intensify the repetition, flutes, horns and upper strings join in for bars 29-40. The articulation of the horns (soft attack, crescendo till the second beat, and ending accent) is intended to give the same forward momentum as was discussed above for bars 19-34 of movement 6.

The fugato section from bar 49 is rather long (40 bars, including repetitions and development). For a continuous increase throughout this section, it is therefore important to distribute the resources well. My solution is to carry out the whole first exposition with strings only (the fugue theme is well suited for this), and add woodwinds for the repetition (from bar 61 in the orchestral score). Then, as the fugato develops further from bar 73, the brass instruments are available to support the ascending scales in the low voices. However, since this development culminates in rather high registers, I found it appropriate to leave out the brass from bars 81-88 and use merely the full woodwind and string sections.

Of the four movements, this was the most instructive one with respect to teaching me the effects of articulation and phrasing, for both strings and wind instruments. The reason for this is probably that many articulation solutions may be both effective and attractive in this movement, while at the same time leading to quite different characters for the piece as a whole. It was therefore useful that my supervisor both made me aware of this, and provided suggestions on various articulations. The final solution shown in the score, hopefully enhances the playful and dancing character I feel lies in this movement; neither too frenetic nor too relaxed.

In the initial draft, I scored the choral-like coda from bar 109 for soft brass only, as this would give a calm contrast to the preceding sections. However, because this made it somewhat difficult to add further timbre later in the coda, and also because the final statement of the opening theme (bars 101-108) grew to include most wind instruments, I was forced to reconsider this decision. The final solution with soft strings hopefully provides the desired character and contrast for the coda. A few wind instruments are used to colour this chorale further, and the effect of the soft brass section could thus be applied in the very last bars.

4.3.4.4 Movement 8

See Appendix D for the final version of the orchestral score.

Initially, I scored the opening theme, which is light and almost Mendelssohnesque in character, for flutes plus accompaniment only. However, considering the flutes alone to be somewhat weak, I found it appropriate to double the flutes by violins.¹⁶ Following the advice of my supervisor, I settled for bassoons and low strings for the accompanying bass notes. The

¹⁶ Having been reminded of Mendelssohn, I consulted the score of the overture of *A Midsummer Night's Dream*, and found that the fairy-like first rapid motif is played by violins alone. Hence, my doubling of flutes by violins would probably not lead to a significant darkening of the opening theme.

repetition then applies clarinets and violins/violas for the melody, and substitutes horns (and later: trombones) for the bassoons. These two configurations alternate throughout the first section (bars 1-40), and in the recapitulations of this section.

The first “intermezzo” (from bar 41 in the orchestral score) calls for a firm melody, which I have set for winds and low strings, at unison and octave separation. The violins can easily provide the leaping accompaniment figures, and their timbre will not interfere with the melody. As explained in Section 4.3.2 above, I have developed the leaping accompaniment into two-part chords to provide sufficiently harmonic support and a richer sonority, and changed to a common time signature of 6/8 (in the piano score, the bass melody is annotated with 2/4 signature).

I considered including the harp in this movement, as it was tempting to strengthen the melody with harp octaves, for example in bars 57-64. However, apart from these bars and possibly the ending of the second “intermezzo” (bars 129-136), it was difficult to imagine the use of the harp. Besides, even these two sections might be “overloaded” and muddled by this instrument. This is the reason for leaving out the harp from the movement.

The second "intermezzo" invites for the orchestral tutti, however with some variations in intensity and timbre do to the length of this section. The fanfare-like motif calls for extensive use of the brass, and builds up - through punctuated rhythm and suspended harmonies - an impressing effect over each two-bar phrase. The idea of placing the horns between the tuba and the trombones seems to stem from Rimsky-Korsakov (1964, p. 83). Irrespective of the register and placing the horns must be doubled to balance the other brass instruments at the high dynamic levels (*mf* and above) in this section (Piston, 1955, p. 244; Jacob, 1982, p. 54).

The repetition of bars 81-88 (in the piano score) is written out in order to vary the instrumentation; in its first occurrence for brass and strings, and in the latter without the deepest brass, but with woodwinds and xylophone added. Further on, each 8 bar section is given a unique instrument combination, until the full tutti is applied in the concluding statement of this "intermezzo".

Since this is probably the most powerful (and complete) use of the orchestra I have made within these Kreisleriana movements, I add an overview of the distribution of the instruments (Table 4.3). I have then considered the final G major chord (the middle of bar 136; orchestral score).

Considering this chord entirely on its own, i. e., out of the musical context, Table 4.3 indicates that several improvements should be made to the distribution of the instruments:

- The clarinets are very high; they might have been interchanged with the flutes.
- The brass chord seems rather ill-balanced, as Trombone I and II and all the horns play D4 and G4.
- A G-G octave in the bass may be better for the overall balance of the chord. If not too heavy, the tuba and/or a contra-bassoon might play G1. Another solution, which avoids this low G1 and improves the distribution of brass instruments, is to assign G3 to some trombone or horn(s), possibly also Bassoon I.
- The strings appear to be reasonably positioned, and not too dark.

- The D5 (played by only FluteII and half of ViolinsII) might need a strengthening. This could be done by TrumpetII, and the moving of HornI to B4 would then distribute the brass section further.

It must, however, be remembered that the chord analyzed in Table 4.3 arises from part writing and voice leading for all instruments. The changes suggested above might therefore need considerable reworking of the preceding bars. For this study, I can not undertake such a revision. Besides, the chord may work better in its musical context than as an isolated chord. Anyway, it is interesting to see the consequences of a mainly linear way of thinking, that lead to this particular layout for the chord.

After the powerful second intermezzo, the recapitulation of the first theme appears as a sort of coda. I use only strings for the first 12 bars, but then supply with clarinets, bassoons, and later flutes, the scoring being similar to the opening of the movement. The very last bars is a dialogue between strings and clarinets that leads to the final pizzicato notes on the double bass. An alternative ending that might be as effective, would be woodwinds only; however, the last two notes might have required a contra-bassoon, which then should have been incorporated into the whole movement.

Table 4.3: The distribution of instruments in the tutti G major chord that closes the second "intermezzo" of movement 8 (middle of bar 136 in the orchestral score, see Appendix D). The instruments are placed at their sounding pitch.

Note	Woodwind	Brass	Percussion	Strings
G6			Xyl	Vln I (div.)
D6	Cl I+II			Vln I (div.)
B5				
G5	Fl I; Ob I	Tpt I		Vln II (div.)
D5	Fl II			Vln II (div.)
B4	Ob II	Tpt II		Vla (div.)
G4		Tbn I; Hn I+III		
D4		Tbn II; Hn II+IV		Vla (div.)
B3	Bsn I	Tbn III		Vc (div.)
G3				
D3				
B2				
G2	Bsn II	Tba; Tbn bass	Timp	Db; Vc (div.)

4.4 Conclusions

Arranging for orchestra is indeed a complex task, where the individual instruments, their combination, and the music's inherent characteristics must be taken care of simultaneously. Having worked through these piano movements, I have drawn some basic conclusions; it comes as no surprise that these experiences coincide well with the advices in Sections 2.1.2 and 2.1.3:

- It is essential to know the basics of the orchestral instruments, their range, capabilities, and individual sound.
- It is equally important to know well the original piece that shall be orchestrated, and to have an opinion of which musical ideas and qualities the listener should experience.
- A good aural imagination and sense for timbral balance is needed when combining the instruments.
- The large-scale structure of the work should always be kept in mind, as the effect of the orchestration may work both ways; it may both improve and destroy the perception of this structure. The orchestration should always help in enhancing contrasts and clarifying the structural elements.
- Variation in instrumentation, at both structural and local (phrase) level, is essential to keep the listener engaged, and to clarify the structure.

The concepts of clarity, balance, and variation appear to me as the three essential keywords that characterize good orchestration. This conclusion agrees well with the statements by the experienced orchestrators quoted in Section 2.1.2.

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Appendix A

Kreisleriana, movement 1

Orchestral score

Kreisleriana, movement 1

Score in C

Robert Schumann (orig. piano version)
Orch.: Jon Bang

Äusserst bewegt ♩ = 80

Piccolo

I / Piccolo
Flute *Flute I and Piccolo to be played by the same flautist*

II

I
Oboe

II

I
Clarinet in Bb

II

I
Bassoon

II

I, II
Horn in F

III, IV

Trumpet in Bb

Trombone I, II

Trombone III, Tuba

Triangle

Xylophone

Harp
D C bB bE F bG A

Äusserst bewegt ♩ = 80

Violin I *pizz*

Violin II *pizz*

Viola *pizz*

Violoncello *pizz*

Double Bass *pizz*

6

I / Picc.

Flute II

Ob. I

Ob. II

Cl. I

Cl. II

Bsn. I

Bsn. II

Hn. I, II

Hn. III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

Hp.

Vln. I

Vln. II

Vla.

Vc.

Db.

arco

A

B

12

I / Picc.
Flute

II

Ob.
I
II

Cl.
I
II

Bsn.
I
II

Detailed description: This section of the score covers measures 12 through 16. It includes parts for Piccolo/Flute (I and II), Oboe (I and II), Clarinet (I and II), Bassoon (I and II), Horn (I and II), Trumpet, Trombone (I and II), and Tuba. The woodwinds and brass instruments have various melodic and harmonic parts. Dynamics include *sf*, *f*, *mf*, and *ff*. There are accents and slurs throughout.

B

Vln. I

Vln. II

Vla.

Vc.

Db.

Detailed description: This section of the score covers measures 12 through 16 for the string ensemble. It includes parts for Violin I, Violin II, Viola, Violoncello, and Double Bass. The strings play a rhythmic accompaniment with some melodic lines. Dynamics include *sf*, *f*, and *pizz*. There are markings for *divisi* and *non divisi*.

23 $\text{♩} = 72$ **C** *Piccolo change to Flute I* 5

I / Picc.
Flute

II

I
Ob.

II

I
Cl.

II

I
Bsn.

II

I, II
Hn.

III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

Hp.

Vln. I $\text{♩} = 72$ **C**

Vln. II

Vla.

Vc.

Db.

ff sf

pp

sf

sf

sf

sf

f

f

sf

pp

ppp

ppp

ppp

non divisi

ppp

ppp

non divisi

ppp

G

6 28

I / Picc.
Flute

pp

3

3

3

3

pp

3

ppp

I
Ob.

II

I
Cl.

II

I
Bsn.

II

I, II
Hn.

III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

Hp.

E #G G bG bE

Vln. I

Vln. II

Vla.

Vc.

Db.

33 **D**

I / Picc. Flute II

Ob. I II

Cl. I II

Bsn. I II

Hn. I, II

III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

Hp.

Vln. I

Vln. II

Vla.

Vc.

Db.

pp $\underline{3}$

ppp $\underline{3}$

pppp

pppp

simile

non trem.

pizz

G *E*

E

I / Picc.
 Flute
 II
 I
 Ob.
 II
 I
 Cl.
 II
 I
 Bsn.
 II
 I, II
 Hn.
 III, IV
 Tpt.
 Tbn. I, II
 Tbn. III, Tba.
 Tri.
 Xyl.
 Hp.
 Vln. I
 Vln. II
 Vla.
 Vc.
 Db.

Musical score for page 8, measures 38-42. The score includes parts for Piccolo, Flute, Oboe, Clarinet, Bassoon, Horn, Trumpet, Trombone, Triangle, Xylophone, Harp, Violin, Viola, Violoncello, and Double Bass. A key signature change to E major is indicated at the end of the page.

44

I / Picc.
Flute

II

I
Ob.
p

II

I
Cl.

II

I
Bsn.

II

I, II
Hn.

III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

Hp.
bB, bD
bG
#F, D
G
F
bG

Vln. I
pp

Vln. II
pp

Vla.
pp

Vc.
pp

Db.

pp

pp

49 **F**

I / Picc.
Flute

II

I
Ob.

II

I
Cl.

II

I
Bsn.

II

I, II
Hn.

III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

Hp.

sempre pp

G bC bA #B #F, A, C bB, #E

F

Vln. I

Vln. II

Vla.

Vc.

Db.

ppp

ppp

ppp

ppp

I / Picc.
Flute

II

I
Ob.

II

I
Cl.

II

I
Bsn.

II

Dynamic markings: *p*, *pp*, *simile*

Technical markings: *3*

I, II
Hn.

III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Dynamic markings: *pp*

Tri.

Xyl.

Hp.

Dynamic markings: *pp*

Chordal markings: *#D*, *D, F*, *bE*

Vln. I

Vln. II

Vla.

Vc.

Db.

Dynamic markings: *pp*, *non trem.*, *divisi*

Section marker: **G**

I / Picc.
Flute

II

I
Ob.
p

II

I
Cl.
pp

II

I
Bsn.

II

I, II
Hn.

III, IV

Tpt.
mute *pp*

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

Hp.

Vln. I

Vln. II

Vla.

Vc.

Db.

65 **H**

Flute I change to Piccolo

13

I / Picc. Flute

II

I Ob.

II

I Cl.

II

I Bsn.

II

I, II Hn.

III, IV

Tpt.

Tbn. I, II

Tbn. III, Tba.

Tri.

Xyl.

sempre mute

pp

pppp

pppp

Hp.

pp

simile

G bC bA #B #F, A, C bB, #E

H

Vln. I

Vln. II

Vla.

Vc.

Db.

ppp

ppp

ppp

ppp

sempre pizz

pp

♩ = 80

I

14

71

This page of an orchestral score contains staves for the following instruments: Piccolo/Flute I, Flute II, Oboe I, Oboe II, Clarinet I, Clarinet II, Bassoon I, Bassoon II, Horn I and II, Trumpets III and IV, Trombones I and II, Trombones III and Tubas, Triangle, Xylophone, Harp, Violin I, Violin II, Viola, Violoncello, and Double Bass. The score features woodwind and string parts with various markings such as *mf*, *non mute*, and *pizz*. Rehearsal mark I is indicated at the beginning and end of the page.

81 **J**

I / Picc. Flute II Ob. I II Cl. I II Bsn. I II Hn. I, II III, IV Tpt. Tbn. I, II Tbn. III, Tba. Tri. Xyl. Hp.

J

Vln. I Vln. II Vla. Vc. Db.

I / Picc.
 Flute
 II
 I
 Ob.
 II
 I
 Cl.
 II
 I
 Bsn.
 II
 I, II
 Hn.
 III, IV
 Tpt.
 Tbn. I, II
 Tbn. III, Tba.
 Tri.
 Xyl.
 Hp.

Vln. I
 Vln. II
 Vla.
 Vc.
 Db.

I / Picc. - Rest
Flute II - Rest, then *ff* dynamics from measure 93, ending *sf*
Ob. I - Rest, then *ff* dynamics from measure 93, ending *sf*
Ob. II - Rest, then *ff* dynamics from measure 93, ending *sf*
Cl. I - Rest, then *ff* dynamics from measure 93, ending *sf*
Cl. II - Rest, then *ff* dynamics from measure 93, ending *sf*
Bsn. I - Rest, then *ff* dynamics with triplet markings from measure 93, ending *sf*
Bsn. II - Rest, then *ff* dynamics with triplet markings from measure 93, ending *sf*
Hn. I, II - *f* dynamics, playing chords from measure 93
Hn. III, IV - *f* dynamics, playing chords from measure 93
Tpt. - *f* dynamics, playing chords from measure 93
Tbn. I, II - *f* dynamics, playing chords from measure 93
Tbn. III, Tba. - *f* dynamics, playing chords from measure 93
Tri. - Rest
Xyl. - Rest, then *f* dynamics with triplet markings from measure 93, ending *sf*
Hp. - Rest
Vln. I - *ff* dynamics, playing chords from measure 93, ending *non divisi sf*
Vln. II - *f* dynamics, playing chords from measure 93, ending *non divisi*
Vla. - *ff* dynamics, playing chords from measure 93, ending *non divisi*
Vc. - *divisi sf* dynamics, playing chords from measure 93
Db. - *arco ff* dynamics, playing chords from measure 93

Appendix B

Kreisleriana, movement 6

Orchestral score

Kreisleriana, movement 6

Robert Schumann (orig. piano version)
Orch.: Jon Bang

Sehr langsam ♩ = 84

Score in C

The score is arranged in systems. The first system includes Flute I and II, Oboe, Clarinet in Bb, Bass Clarinet in Bb, and Bassoon. The second system includes Horn in F I and II, Trumpet in Bb, and Trombone I and II. The third system includes Timpani. The fourth system includes Violin I and II, Viola, Violoncello, and Double Bass. Dynamics include *pp*, *p*, *mute*, *divisi*, *non divisi*, *solo*, *tutti I*, *pizz*, and *arco*. The tempo is *Sehr langsam* with a metronome marking of ♩ = 84. The key signature is two flats (Bb and Eb) and the time signature is 12/8.

A

5

I Fl.

II Fl.

Ob.

Cl.

B. Cl.

Bsn.

I Hn.

II Hn.

Tpt.

I Tbn.

II Tbn.

A

Timp.

Vln. I

Vln. II

Vla.

Vc.

Db.

normale

pp

sub f

normale

pp

sub f

divisi

non divisi

pp

sub f

non divisi

pp

sub f

sub f

9

B

Fl. I *p* *ppp* *pp*

Fl. II *pp* *pp*

Ob. *p* *p* *pppp*

Cl. *p* *pppp*

B. Cl. *pp* *mp*

Bsn. *p*

Hn. I

Hn. II

Tpt.

Tbn. I

Tbn. II

B

Timp.

B

Vln. I *p* *sul tasto* *ppp* *pp*

Vln. II *p* *sul tasto* *pp*

Vla. *p* *pp* *divisi*

Vc. *pp* *divisi*

Db. *p* *pp*

4 13

Flutes:
I: *pp*, *mp*
II: *pp*, *mp*, *pp*

Oboe: *mp*, *mf*, *mp*

Clarinet: *p*, *mp*, *p*

Bass Clarinet: *mp*

Bassoon: *mp*

Horns:
I: *p*
II: *mp*

Trumpet: *mf*, *f* (with *mute* instruction)

Trombones: I, II (rest)

Timpani: (rest)

Violins:
I: *normale*, *p*, *pp*, *mf*, *f*, *pp* (with *non divisi, sul tasto*)
II: *normale*, *mp*, *mf*, *f*, *pp* (with *non divisi, sul tasto*)

Viola: *non divisi*, *divisi*, *mf*, *f*, *pp* (with *non divisi*)

Violoncello: *p*, *mp*, *mf*, *f*, *pp*

Double Bass: *p*, *mp*, *mf*, *f*

C

17

rit. . . ♩ = 144

Fl. I *pp*

Fl. II

Ob.

Cl. *p*

B. Cl. *pp*

Bsn.

Hn. I

Hn. II *mute* *p*

Tpt. *sempre mute* *pp*

Tbn. I *mute* *pp*

Tbn. II *mute* *pp*

C

rit. . . ♩ = 144

Timp.

C

rit. . . ♩ = 144

Vln. I

Vln. II *normale* *p*

Vla.

Vc. *p*

Db. *p*

D

Fl. I
Fl. II
Ob.
Cl.
B. Cl.
Bsn.

Hn. I
Hn. II
Tpt.
Tbn. I
Tbn. II

D

Timp.
Vln. I
Vln. II
Vla.
Vc.
Db.

1 Fl. I *f*

2 Fl. II *f*

Ob.

Cl.

B. Cl. *f*

Bsn. *f*

Hn. I

Hn. II

Tpt. *f*

Tbn. I *mf*

Tbn. II *mf*

Timp. *mf* *ppp*

Vln. I *f*

Vln. II *f*

Vla. *f*

Vc. *f*

Db. *f* *arco*

8

35

E

$\text{♩} = 84$

I Fl. *pp*

II Fl. *pp* *ppp*

Ob. *ppp*

Cl. *ppp*

B. Cl. *pp*

Bsn. *pp* *pp*

I Hn. *p*

II Hn. *mute* *p*

Tpt. *ppp*

I Tbn. *ppp*

II Tbn. *ppp*

Timp. *ppp*

E

$\text{♩} = 84$

Vln. I *non divisi, arco sul tasto* *pp* *ppp*

Vln. II *non divisi, arco sul tasto* *pp* *ppp* *divisi*

Vla. *divisi* *pp* *pp*

Vc. *pp* *solo p* *pp divisi* *tutti I pp*

Db. *pp* *pizz* *arco* *pp*

Appendix C

Kreisleriana, movement 7

Orchestral score

Kreisleriana, movement 7

Score in C

Robert Schumann (orig. piano version)

Orch.: Jon Bang

Sehr rasch $\text{♩} = 120$

The score is divided into two systems. The first system contains woodwind instruments: Flute I and II, Oboe I and II, Clarinet in Bb I and II, Bass Clarinet in Bb, Bassoon I and II, Horn in F I and II, and Trombone I, II, III, and Bass. All woodwind parts are currently blank, indicated by a horizontal line with a fermata. The second system contains string instruments: Violin I, Violin II, Viola, Violoncello, and Double Bass. The Violin I part begins with a forte (*f*) dynamic and features a triplet of eighth notes. The Viola part is marked *divisi* and *f*. The Violoncello and Double Bass parts are marked *f* and *pizz* (pizzicato). The tempo is *Sehr rasch* with a metronome marking of $\text{♩} = 120$.

A

The score is arranged in systems. The top system includes Flutes I and II, Oboes I and II, Clarinets in Bb I and II, Bass Clarinet in Bb, and Bassoons I and II. The second system includes Horns in F I and II, Horns III and IV, Trumpets in Bb, Trombones I and II, and Trombone III in Bass. The bottom system includes Violins I and II, Viola, Violoncello (Vc.), and Double Bass (Db.).

Key markings and performance instructions include:

- mf**: mezzo-forte dynamic marking for Horns, Trumpets, Trombones, and Bass.
- divisi**: instruction for the Violoncello.
- non divisi**: instruction for the Viola.
- simile**: instruction for the Viola.
- Bass**: instruction for the Bass line.
- 3**: triplet markings in the Violin I part.
- 5**: quintuplet marking in the Violoncello part.

11 3

Fl. I
Fl. II
Ob. I
Ob. II
Cl. in Bb I
Cl. in Bb II
B. Cl. in Bb
Bsn. I
Bsn. II
Hn. in F I, II
Hn. in F III, IV
Tpt. in Bb
Tbn. I, II
Tbn. III, B.
Vln. I
Vln. II
Vla.
Vc.
Db.

divisi

5

B

16

Fl. I
Fl. II
Ob. I
Ob. II
Cl. in Bb I
Cl. in Bb II
B. Cl. in Bb
Bsn. I
Bsn. II
Hn. in F I, II
Hn. in F III, IV
Tpt. in Bb
Tbn. I, II
Tbn. III, B.

B

Vln. I
Vln. II
Vla.
Vc.
Db.

I
 Fl. I
 II
 Fl. II
 I
 Ob.
 II
 Ob.
 I
 Cl. in Bb
 II
 Cl. in Bb
 B. Cl. in Bb
 I
 Bsn.
 II
 Bsn.
 I, II
 Hn. in F
 III, IV
 Hn. in F
 Tpt. in Bb
 Tbn. I, II
 Tbn. I, II
 Tbn. III, B.
 Tbn. III, B.
 Vln. I
 Vln. II
 Vln. II
 Vla.
 Vc.
 Db.
 Db.

non divisi
mf

6

28

C

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

C

Vln. I

Vln. II

Vla.

Vc.

Db.

non divisi

divisi

I pizz

II arco

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

Vln. I

Vln. II

Vla.

Vc.

Db.

p

p

p

p

p

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

Vln. I

Vln. II

Vla.

Vc.

Db.

divisi

ff

divisi etc. (come prima)

ff

ff

non divisi pizz

ff

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

Vln. I

Vln. II

Vla.

Vc.

Db.

f

divisi

E

48

Fl. I
Fl. II
Ob. I
Ob. II
Cl. in Bb I
Cl. in Bb II
B. Cl. in Bb
Bsn. I
Bsn. II

Hn. in F I, II
Hn. in F III, IV
Tpt. in Bb
Tbn. I, II
Tbn. III, B.

E

Vln. I
Vln. II
Vla.
Vc.
Db.

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

Vln. I

Vln. II

Vla.

Vc.

Db.

ff

F

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

F

Vln. I

Vln. II

Vla.

Vc.

Db.

This musical score page covers measures 64 through 68 of a symphony. The instruments are arranged in a standard orchestral layout. The woodwinds (Flutes, Oboes, Clarinets, Bass Clarinet, Bassoons) and strings (Violins, Viola, Violoncello, Double Bass) are active, while the brass instruments (Horns, Trumpets, Trombones) are mostly silent. The score includes various musical notations such as dynamics (mf, f), articulation (accents, slurs), and phrasing. The key signature is B-flat major, and the time signature is 4/4. The page number 64 is located at the top left.

Flutes: Fl. I and II. Fl. I has a dynamic marking of *f* at the end of measure 68.

Oboes: Ob. I and II. Ob. I has a dynamic marking of *f* at the end of measure 68.

Clarinets: Cl. in Bb I and II. Cl. in Bb I has a dynamic marking of *f* starting in measure 67.

Bass Clarinet: B. Cl. in Bb. Dynamic marking of *mf* at the start of measure 64.

Bassoons: Bsn. I and II. Bsn. I has a dynamic marking of *mf* at the start of measure 67.

Violins: Vln. I and II. Vln. II has a dynamic marking of *f* at the end of measure 68.

Viola: Vla. Dynamic marking of *mf* at the start of measure 64.

Violoncello: Vc. Dynamic marking of *mf* at the start of measure 64.

Double Bass: Db. Dynamic marking of *mf* at the start of measure 64.

Fl. I
Fl. II
Ob. I
Ob. II
Cl. in Bb I
Cl. in Bb II
B. Cl. in Bb
Bsn. I
Bsn. II
Hn. in F I, II
Hn. in F III, IV
Tpt. in Bb
Tbn. I, II
Tbn. III, B.
Vln. I
Vln. II
Vla.
Vc.
Db.

poco marcato
mf

mf
f

Detailed description: This page of a musical score covers measures 74 to 78. The score is for a full orchestra. The woodwind section includes Flutes I and II, Oboes I and II, Clarinets in Bb I and II, Bass Clarinet in Bb, Bassoons I and II, Horns in F I and II, and Horns in F III and IV. The brass section includes Trumpets in Bb, Trombones I and II, and Trombone III and Bass. The string section includes Violins I and II, Viola, Violoncello, and Double Bass. The score begins with a key signature of two flats and a common time signature. The woodwinds and strings play sustained notes, while the clarinet and trombone parts have more active melodic lines. Dynamic markings include *poco marcato*, *mf*, and *f*. Measure numbers 74, 75, 76, 77, and 78 are indicated at the top of the staves.

H

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

f

f

f

f

f

f

f

f

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

Vln. I

Vln. II

Vla.

Vc.

Db.

f

(divisi)

pizz

arco

pizz

H

89 **I**

Fl. I *ff*

Fl. II

Ob. I *ff*

Ob. II

Cl. in Bb I

Cl. in Bb II *ff*

B. Cl. in Bb

Bsn. I

Bsn. II *ff*

Hn. in F I, II *mf*

Hn. in F III, IV *mf*

Tpt. in Bb

Tbn. I, II

Tbn. III, B. *mf*

Vln. I *non divisi* *ff*

Vln. II

Vla.

Vc.

Db. *1 pizz* *ff*

I
 Fl. II
 I
 Ob. II
 I
 Cl. in Bb II
 B. Cl. in Bb
 I
 Bsn. II
 I, II
 Hn. in F III, IV
 Tpt. in Bb
 Tbn. I, II
 Tbn. III, B.
 Vln. I
 Vln. II
 Vla.
 Vc.
 Db.

mf *mf* *mf* *mf* *mf*

I
 Fl. I
 II
 Ob. I
 II
 Cl. in Bb I
 II
 B. Cl. in Bb
 Bsn. I
 II
 Hn. in F I, II
 III, IV
 Tpt. in Bb
 Tbn. I, II
 Tbn. III, B.
 Vln. I
 Vln. II
 Vla.
 Vc.
 Db.

Musical score for measures 103-106. The score includes parts for Flutes (I, II), Oboes (I, II), Clarinets in Bb (I, II), Bass Clarinet in Bb, Bassoons (I, II), Horns in F (I, II, III, IV), Trumpets in Bb, Trombones (I, II, III, B), Violins (I, II), Viola, Violoncello, and Double Bass. The key signature is three flats (Bb, Eb, Ab).

Etwas langsamer $\text{♩} = 80$

K

22

107

Musical score for woodwinds and brass instruments. The score is divided into two systems. The first system includes Flutes (I, II), Oboes (I, II), Clarinets in Bb (I, II), Bass Clarinet in Bb, Bassoons (I, II), Horns in F (I, II), Trombones in Bb (I, II), and Trombone III in Bb. The second system includes Horns in F (III, IV), Trombone in Bb, Trombone I in Bb, and Trombone III in Bb. The notation includes various notes, rests, and dynamic markings such as *p* and *divisi*.

Etwas langsamer $\text{♩} = 80$

K

Musical score for string instruments. The score includes Violins I and II, Viola, Violoncello (Vc.), and Double Bass (Db.). The notation includes various notes, rests, and dynamic markings such as *p* and *divisi*. A specific instruction *divisi* is written above the Cello part, and a *5* is written above the Bass part, indicating a five-measure rest.

Fl. I

Fl. II

Ob. I

Ob. II

Cl. in Bb I

Cl. in Bb II

B. Cl. in Bb

Bsn. I

Bsn. II

Hn. in F I, II

Hn. in F III, IV

Tpt. in Bb

Tbn. I, II

Tbn. III, B.

Vln. I

Vln. II

Vla.

Vc.

Db.

divisi

p

p

divisi

p

p

arco

p

I Fl. I
 II Fl. II
 I Ob.
 II Ob.
 I Cl. in Bb
 II Cl. in Bb
 B. Cl. in Bb
 I Bsn.
 II Bsn.
 I, II Hn. in F
 III, IV Hn. in F
 Tpt. in Bb
 Tbn. I, II
 Tbn. III, B.
 Vln. I
 Vln. II
 Vla.
 Vc.
 Db.

Musical score for a symphony orchestra, page 24, measures 122-125. The score includes parts for Flutes I & II, Oboes I & II, Clarinets in Bb I & II, Bass Clarinet in Bb, Bassoons I & II, Horns in F I, II, III, IV, Trumpets in Bb, Trombones I & II, Trombone III & Bass, Violins I & II, Viola, Violoncello, and Double Bass. The music is in a key with two flats and a 4/4 time signature. Dynamics include piano (*p*) and non divisi markings.

I Fl.
 II Fl.
 I Ob.
 II Ob.
 I Cl. in Bb
 II Cl. in Bb
 B. Cl. in Bb
 I Bsn.
 II Bsn.
 I, II Hn. in F
 III, IV Hn. in F
 Tpt. in Bb
 Tbn. I, II
 Tbn. III, B.
 Bass
 Vln. I
 Vln. II
 Vla.
 Vc.
 Db.

Musical score for measures 130-134. The score includes parts for Flute (I, II), Oboe (I, II), Clarinet in Bb (I, II), Bassoon (I, II), Horn in F (I, II, III, IV), Trumpet in Bb, Trombone (I, II, III, Bass), Violin (I, II), Viola, Violoncello, and Double Bass. A 'M' rehearsal mark is present at the beginning of measure 130 and in the Bass line at measure 134. Dynamics include *pp* and *pp*.

Appendix D

Kreisleriana, movement 8

Orchestral score

Kreisleriana, movement 8

Score in C

Robert Schumann (orig. piano version)
Orch.: Jon Bang

Schnell und spielend $\text{♩} = 90$

The score is arranged in systems for various instruments. The woodwind section includes Flute I and II (both marked *p*), Oboe I and II, Clarinet in B \flat I and II, Bassoon I and II (both marked *pp*), Horn in F I and II, Trumpet I and II in B \flat , Trombone I and II, Trombone III, Bass Tbn., and Tuba. The string section includes Violin I and II (both marked *pp*), Viola, Violoncello (marked *p*), and Double Bass (marked *p*). The percussion section includes Timpani and Xylophone. The score is in 3/8 time and features a complex melodic line in the woodwinds and strings, with a steady bass line in the lower strings.

A

8

Fl. I

Fl. II

Ob. I

Ob. II

Cl. I *mp*

Cl. II *mp*

Bsn. I

Bsn. II

Hn. I, II *p*

Hn. III, IV *p*

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Timp.

Xyl.

Vln. I *p*

Vln. II

Vla. *p*

Vc. *mp*

Db. *mp*

14

15 **B**

Fl. I *p*

Fl. II *p*

Ob. I

Ob. II

Cl. I

Cl. II

Bsn. I *pp*

Bsn. II *pp*

Hn. I, II

Hn. III, IV

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Timp.

Xyl.

Vln. I *pp*

Vln. II *pp*

Vla.

Vc. *p*

Db. *p*

3

C

Fl. I
Fl. II
Ob. I
Ob. II
Cl. I
Cl. II
Bsn. I
Bsn. II
Hn. I, II
Hn. III, IV
Tpts. I, II
Tbn. I, II
Tbn. III, B.
Tba.
Timp.
Xyl.
Vln. I
Vln. II
Vla.
Vc.
Db.

mp
mp
mp
II
p
Bass p
III p
p
mp
mp
p
mp

30

D

Fl. I *p*

Fl. II *p*

Ob. I

Ob. II

Cl. I

Cl. II

Bsn. I *pp*

Bsn. II *pp*

Hn. I, II

Hn. III, IV

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Tim.

Xyl.

Vln. I *pp*

Vln. II *pp*

Vla.

Vc. *p*

Db. *p*

5

46

Fl. I, II

Ob. I, II

Cl. I, II

Bsn. I, II

Hn. I, II

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Timp.

Xyl.

Vln. I, II

Vla.

Vc.

Db.

mf

F

G

54

The musical score consists of the following parts and their characteristics:

- Flute (Fl.):** I and II parts, mostly silent.
- Oboe (Ob.):** I and II parts, playing a melodic line starting in measure 54.
- Clarinet (Cl.):** I and II parts, playing a melodic line starting in measure 54.
- Bassoon (Bsn.):** I and II parts, playing a melodic line starting in measure 54.
- Horn (Hn.):** I and II parts, playing a melodic line starting in measure 54, with dynamics *f* and *ppp*.
- Trumpet (Tpts.):** I and II parts, playing a melodic line starting in measure 54, with dynamics *mp* and *f*.
- Trombone (Tbn.):** I, II, III, and Bass parts, playing a melodic line starting in measure 54, with dynamics *f*.
- Tuba (Tba.):** Part, mostly silent.
- Timpani (Timp.):** Part, mostly silent.
- Xylophone (Xyl.):** Part, mostly silent.
- Violin (Vln.):** I and II parts, playing a rhythmic pattern starting in measure 54. A 'G' section marker is above the Violin I part at measure 57.
- Viola (Vla.):** Part, playing a melodic line starting in measure 54, with dynamics *f* and *sf*.
- Violoncello (Vc.):** Part, playing a melodic line starting in measure 54, with dynamics *f* and *sf*.
- Double Bass (Db.):** Part, playing a melodic line starting in measure 54, with dynamics *f* and *sf*.

61 H 9

Fl. I *p*

Fl. II *p*

Ob. I *f* *sf*

Ob. II *f* *sf*

Cl. I *p*

Cl. II *p*

Bsn. I *p*

Bsn. II *p*

Hn. I, II

Hn. III, IV

Tpts. I, II *f* *sf*

Tbn. I, II *f* *sf*

Tbn. III, B. *Bass* *mf* *sf*

Tbn. *mf* *sf*

Timp.

Xyl.

Vln. I *p*

Vln. II *p*

Vla. *sf* *divisi*

Vc. *sf* *p*

Db. *sf* *p*

68

I

Fl. I

Fl. II

Ob. I

Ob. II

Cl. I

Cl. II

Bsn. I

Bsn. II

Hn. I, II

Hn. III, IV

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Timp.

Xyl.

Vln. I

Vln. II

Vla.

Vc.

Db.

mp

p

non divisi

Fl. I, II

Ob. I, II

Cl. I, II

Bsn. I, II

Hn. I, II

III, IV

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Timp.

Xyl.

Vln. I

Vln. II

Vla.

Vc.

Db.

Fl. I *f*

Fl. II *f*

Ob. I *f*

Ob. II *f*

Cl. I *f*

Cl. II *f*

Bsn. I *f*

Bsn. II *f*

Hn. I, II *f*

Hn. III, IV *f*

Tpts. I, II *f*

Tbn. I, II *f*

Tbn. III, B. *f*

Tba. *f*

Timp.

Xyl.

Vln. I *f* *spiccato* *divisi*

Vln. II *f* *spiccato* *divisi*

Vla. *f* *spiccato* *divisi*

Vc. *f*

Db. *f*

96 **L**

Fl. I
Fl. II
Ob. I
Ob. II
Cl. I
Cl. II
Bsn. I
Bsn. II
Hn. I, II
Hn. III, IV
Tpts. I, II
Tbn. I, II
Tbn. III, B.
Tba.
Timp.
Xyl.

L

non divisi

divisi

f

divisi

arco

Il pizz

divisi

f

Vln. I
Vln. II
Vla.
Vc.
Db.

103

This page of a musical score, page 15, contains measures 103 through 108. The score is for a large orchestra and woodwind section. The instruments listed on the left are:

- Flute (Fl.) I and II
- Oboe (Ob.) I and II
- Clarinet (Cl.) I and II
- Bassoon (Bsn.) I and II
- Horn (Hn.) I, II, III, IV
- Trumpet (Tpts.) I, II
- Trombone (Tbn.) I, II, III, Bass Trombone (B.)
- Tuba (Tba.)
- Timpani (Timp.)
- Xylophone (Xyl.)
- Violin (Vln.) I and II
- Viola (Vla.)
- Violoncello (Vc.)
- Double Bass (Db.)

The score is in 2/4 time and features a variety of rhythmic patterns and dynamics. The dynamic marking *mf* (mezzo-forte) is used throughout. A section marked **M** begins at measure 103. The woodwinds and strings play complex rhythmic figures, while the brass instruments provide harmonic support. The score concludes with a final *mf* dynamic marking at the end of measure 108.

N

110

Fl. I
Fl. II
Ob. I
Ob. II
Cl. I
Cl. II
Bsn. I
Bsn. II
Hn. I, II
Hn. III, IV
Tpts. I, II
Tbn. I, II
Tbn. III, B.
Tba.
Timp.
Xyl.
Vln. I
Vln. II
Vla.
Vc.
Db.

The score is written for measures 110 through 113. It includes parts for Flutes (I and II), Oboes (I and II), Clarinets (I and II), Bassoons (I and II), Horns (I, II, III, IV), Trumpets (I, II), Trombones (I, II, III, Bass), Tuba, Timpani, Xylophone, Violins (I and II), Viola, Violoncello, and Double Bass. The key signature has two flats (B-flat and E-flat), and the time signature is 4/4. A rehearsal mark 'N' is placed above measure 111. Dynamics include *f* (forte) in measures 111 and 112. The Xylophone part has a melodic line in measures 110-111. The Trombone III, Bass part has a melodic line in measures 111-112. The Viola part has a melodic line in measures 110-111. The Violoncello and Double Bass parts have a melodic line in measures 110-111.

I Fl. *f*
 II Fl. *f*
 I Ob. *f*
 II Ob. *f*
 I Cl. *f*
 II Cl. *f*
 I Bsn. *f*
 II Bsn. *f*
 I, II Hn. *f*
 III, IV Hn. *f*
 Tpts. I, II *f*
 Tbn. I, II *f*
 Tbn. III, B. *f*
 Tba. *f*
 Timp.
 Xyl.
 Vln. I *f* *spiccato* *divisi*
 Vln. II *f* *spiccato* *divisi* *arco*
 Vla. *f* *spiccato* *divisi*
 Vc. *f* *divisi*
 Db. *f*

P

124

Fl. I, II *mf*

Ob. I, II *mf*

Cl. I, II *mf*

Bsn. I, II *mf*

Hn. I, II *mf*

III, IV *mf*

Tpts. I, II *f*

Tbn. I, II *mf*

Tbn. III, B. *mf*

Tba. *mf*

Timp. *mf*

Xyl. *mf*

Vln. I *mf* **P** *spiccato*

Vln. II *mf* *spiccato*

Vla. *mf* *spiccato*

Vc. *mf* *divisi*

Db. *mf*



Fl. I, II

Ob. I, II

Cl. I, II

Bsn. I, II

Hr. I, II

III, IV

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Timp.

Xyl.

Vln. I

Vln. II

Vla.

Vc.

Db.

divisi

p

pp

divisi a 2

Fl. I
Fl. II
Ob. I
Ob. II
Cl. I
Cl. II
Bsn. I
Bsn. II
Hn. I, II
Hn. III, IV
Tpts. I, II
Tbn. I, II
Tbn. III, B.
Tba.
Timp.
Xyl.
Vln. I
Vln. II
Vla.
Vc.
Db.

146

Fl. I, II
Ob. I, II
Cl. I, II
Bsn. I, II
Hn. I, II
Tpts. I, II
Tbn. I, II
Tbn. III, B.
Tba.
Timp.
Xyl.
Vln. I, II
Vla.
Vc.
Db.

Rehearsal mark **R** is located above measures 146 and 150.

Dynamic markings *p* (piano) are present in measures 146, 147, 149, 150, and 151.

rit.

S

The musical score is arranged in a standard orchestral format with staves for various instruments. The woodwind section includes Flute I and II, Oboe I and II, Clarinet I and II, Bassoon I and II, Horn I and II, Trumpets I and II, Trombones I, II, and Bass, and Tuba. The percussion section includes Timpani, Xylophone, Violin I and II, Viola, Violoncello, and Double Bass. The score begins with a *rit.* marking and a dynamic of *pp*. A section marked **S** starts in measure 154. The Flute I and II parts have melodic lines with *pp* dynamics. The Bassoon I and II parts have sustained notes with *pp* dynamics. The Violin I and II parts have melodic lines with *pp* dynamics. The Viola part has a melodic line with *pp* dynamics. The Violoncello and Double Bass parts have sustained notes with *pp* dynamics. The score ends in measure 161.

162

T

Fl. I, II

Ob. I, II

Cl. I, II

Bsn. I, II

Hn. I, II

III, IV

Tpts. I, II

Tbn. I, II

Tbn. III, B.

Tba.

Tim.

Xyl.

Vln. I, II

Vla.

Vc.

Db.

pp

ppp

ppp

pp

ppp

ppp

ppp

pp

ppp

divisi

pizz

ppp