TCHAIKOVSKY'S CRY OF DESPAIR

(During a break in a new rehearsl of Beethoven's String Quartet Opus 18 number 5, Math (violin), List (violin), Perf (viola), and Comp (cello), discuss List's earlier remark that a certain fragment of Variation 4 in the third movement, Andante cantabile, reminded her of the beginning of the last movement of Tchaikovsky's Sixth Symphony. Math and Perf have done some homework in order to facilitate the discussion. Math has written the passages in a piano extract, whereas Perf has made copies of the score of the symphony.)

Beethoven, op. 18, no. 5

Tchaikovsky, op. 74

PERF. Your transcription of Tchaikovsky is closer to the opening bars of the Andante non tanto (letter G of the score) than to the first two bars of the Adagio lamentoso at the very beginning of the Finale, where the string instruments jump through the chords so to say (*He shows two copies of the relevant fragments*).

When I studied conducting at the Royal Conservatory of Music, I already wondered how different the two passages would sound, but that is another question. I also remember that I was once asked to give a harmonic analysis of these two bars. It was at a competition for young conductors, and we wondered what use it could have. Some of us even wondered if harmonic analyses could have any use at all …

MATH. This is strange, their teachers should have told them that a harmonic analysis can have many functions. such as:

- description of the 'structure' of the composition
- 'insight' into the compositional principles of the composer
- prescription of performance 'features'
- explanation of 'special reactions' by the experienced listener

However, I do not think that this list will convince music students. In my opinion, theory should not be presented apart from problems. I assume that even you as an experienced conductor are sometimes in doubt how to phrase or articulate a certain musical fragment. In such a situation a harmonic analysis may prescribe certain performance features. Tchaikovsky's opening bars of the Finale of his Sixth Symphony are perhaps an example. By the way, can you still analyze it?

PERF. The system of harmonic analysis that I learned makes use of degrees, and the first chord of Tchaikovsky's cry of despair can be analyzed as the seventh chord of the second degree in F sharp minor. But I understand that you are an opponent of this method. Why actually?

MATH. One of my grievances against the watch number system is that it does not account for comma differences.

LIST. What do you mean by that?

MATH. (*takes his violin*) Here is an example. (*He starts playing the beginning – (bars 132-137 – of the major middle part of Bach's Chaconne from the Second Partita for Violin Solo.*)

The first e^1, played together with a cis^1 – I still use the Dutch names – is higher than the second e^1 played together with the G-string, forming a consonant major sixth. The last two e^1's are the same as the first one. The difference is small, but still audible. This means that one cannot speak about 'the' so-called 'second degree' without blurring the distinction between these two tones.

It is even possible that a comma difference takes place between two successive tones. Listen, do you hear that the second c^2 is slightly higher than the first one? (*He gives each of the others a small piece of paper and he plays the following chords.*)

er-hör' mein Seuf-zen

LIST. I do! But the plus sign is new to me.

MATH. I will give a tone matrix in which all possible pitches of this example occur, abstracting from octave differences. Wait a minute (*he takes a piece of paper*):

c		g		d		a	
	es		bes		f		+c

You see, the first two chords come from the five tones on the left of the matrix, the following two chords come from the five tones on the right. If this is clear to you, I can easily explain the difference of the two c's in Tchaikofsky's example. Let us therefore return to his first chord,

First of all, when it is analyzed as a chord of the so-called second degree, the question which of the two tones *gis*[1] is meant remains unanswered.

COMP. I remember that a fellow sudent of mine analyzed the chord as I[6], that is, the tonic with an added sixt.

MATH. Allright, but did he or she tell which sixth?

COMP. We did not learn such things!

LIST. Enough about theory, what matters is the audible difference between the two tones *gis*[1]. Go ahead, Math!

MATH. Before becoming concrete, I will again give a tone matrix in which all possible pitches of the example occur:

	gis				ais		eis	
e		b		fis		cis		+gis
	g		d					

I added a plus sign to one of the gises, because its pitch is higher than the pitch of the other gis. How this comes about can best be seen from the corresponding frequency ratios of the tones. By fixing the b at 480, we can compute the frequencies of the tones cis, d, e, eis, fis, gis, +gis, and ais. I let them increase in height because of the scale. This results in the following frequency matrix:

	800				900		675	
640		480		720		540		810
	768		576					

You see, the frequency ratio of the gis and the +gis amounts to 80:81, a small, but audible difference, certainly in combination with other well-chosen tones, as we noticed in the Bach example.

LIST. It is time to hear the difference. Can't we play the beginning of the Finale ourselves?

PERF. Then I will give each of you the relevant part from the original score. I made enough copies in the rehearsal room of my orchestra.

COMP. It is indeed quite different from your piano score, Math!

MATH. Yes, but it is useful if we want to choose the right intonation.

PERF. True, so let us assume that the three upper voices have tuned their instruments with the same a^1, and the cello an exact octave lower a.

MATH. Suppose, moreover, that we tune our instruments in perfect fifths, and Perf takes the empty D-string for his first d^1. Then I can adapt my b^1 to the d^1 of Perf, and next List her fis^2 to my e b^1. (*This is all successfully carried out.*)

COMP. Now it is my turn! I will first play the gis^1 as the normal leading tone to the a^1, the +gis in the tone matrix. Our tone a does not occur in it, but it is clear that it must be put next to the d. (*She notes it down.*)

	gis				ais		eis	
e		b		fis		cis		+gis
	g		d		a			

MATH. There we go! (*They carefully play the first chord.*)

LIST. It sounds …

PERF. But now the alternative! Can you lower the *gis*[1] a little bit, Comp?

COMP. I can do it, when Math plays his *b*[1] by himself. Then I can adjust my *gis*[1] to it. (*This is done.*)

MATH. Please, List and Perf, join in! (*So they do.*)

LIST. This chord sounds mellower to me. Is it because it contains four consonant intervals, whereas the first chord contains only three?

MATH. Or, the former chord contains three dissonant intervals, and the latter two. This may also explain your and mine impression.

COMP. Can the difference in tension between the first and the second chord be derived from their frequency ratios?

MATH. Perhaps, but then we must calculate the relative positions of the tones, taking octave differences into account:

$$
\begin{array}{cc}
1440 & 1440 \\
960 & 960 \\
810 & 800 \\
576 & 576
\end{array}
$$

The excentric position of the *gis*[1] (810) in the corresponding tone matrix remains crucial, I think:

	800							
		960		1440				810
			576					

In fact, the difference of the two chords is not new to me, on the contrary. In earlier studies I showed that chords with connected tones such as the second chord, may serve as transient or transition chords, whereas chords with a separated tone, such as the first, are used in cadences. The idea is that the added tone belongs to another function, either the dominant, or the subdominant.

COMP. The second chord of Tchaikofsky is a chord of the seventh, but it is not resolved, on the contrary. I assume thatMath will regard it as a transient or transition chord!

LIST. This is all well and good, but I want to hear it first! Let's play the whole phrase! (*So they do.*)

COMP. In my opinion, the first, fourth and sixth chord are the main elements of the phrase, so let us consider these chords and omit the others. There are some alternatives for the last chord. (*She plays them on the piano.*)

LIST. The last version reminds me of Beethoven!

PERF. Maybe we can learn from the analysis of his phrase? (*He takes out the transcription for piano.*)
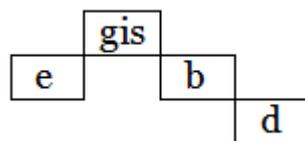
Can you give the corresponding tone matrix, Math?

MATH. The only problem that I see concerns the *gis* and the *gis*[1] in the first bar. Therefore the matrix contains two gises:

	-gis						eis		bis
e		b		fis		cis		gis	
			d		a				

In my opinion, he second chord has the following form:

	gis	
e		b
		d

It seems that the piece begins in B minor, but the transient chord and the following preparatory chord open the door to Fis minor as the tonic. Notice the voice leading, resulting in a higher gis:

	-gis						**eis**		
e		**b**						**gis**	
			d						

The preparatory chord consists of two harmonic minor thirds, separated by a major and minor triad:

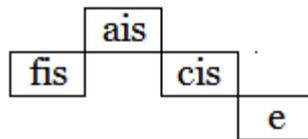|			ais		eis	
b		fis		cis		**gis**
	d		a			

COMP. Why not analyzing the beginning of Tchaikofsky also in Fis minor, as if it would proceed analogously to Beethoven? (*She plays the following on the piano.*)

MATH. Then the tone matrix is simple:

			ais		eis	
b		fis		cis		gis
	d		a		e	

COMP. It follows that the second chord is a transient chord of the same form as the second chord of Beethoven:

Then the *gis¹* in the first chord can be regarded as an anticipation of the third chord, as if the second chord is not essential. (*She plays the following on the piano.*)

MATH. Or even

COMP. This is more suited for the end of a movement, certainly not for the beginning. There a closure on a chord of the seventh is appropriate.

LIST. It reminds me of the beginning of the Tristan-Vorspiel. The first phrase ends also in a chord of the seventh.

COMP. I see what you mean (*She plays the following*.):

MATH. There are indeed musicologists who hear reminiscenses of Wagner in the beginning of the fourth movement of the 'Pathétique'.
   By the way, I do not call the last chord of this fragment a chord of the seventh, but a major dominant chord with a characteristic dissonant. The same holds for the last chord of Tchaikofsky's phrase

PERF. I am afraid that your preoccupation with theorizing went too far. Until now, the practice of performing the beginning of the Finale has not even been dealt with. We are inclined to agree that the violoncelli should intonate their *gis*[1] high, because we ourselves were in the position that we

could fine-tune the crucial chord. In practice, this is out of question if the last movement follows the third movement without a break, apart from the rests in the last bar.

LIST. Unless the audience begins to applaud after the G major violence , as I experienced more than once …

PERF. What do we know about the concert practice of the late nineteenth century? Was it, perhaps, a custom to applaud after each movement? Or was it necessary to retune the instruments, notably the string instrumemts, assuming that gut strings were used?

COMP. In our time it is possible and perhaps desirable to start the last movement immediately after the third movement. Then the end of the third movement is so impressive, that listeners will still have the G major chord in their ears.

LIST. And the fate motive ta-ta-ta-tam in G in the last two bars.

PERF. In that case, the appearance of the *gis*[1] is the more impressive.

COMP. All right, but the chord to which it is added, is very close to the G major chord, as we can see from the matrix:

	gis				ais		eis	
e		b		fis		cis		+gis
	g		d		a			

Doesn't this make it plausible that the celli choose for the lower *gis*[1], although the chord becomes a transient chord in that case, and loses its substantial character? What must the conductor tell them at the reheasals? A theoretical analysis in the way of Math?

PERF. I am now convinced that conductors should have a thorough theoretical knowledge. But in this case the conductor can tell the celloists at the rehearsals that the chord comes on the strong part of the measure and requires a higher gis in order to sound as surprising as possible! Perhaps this is sufficient, and he does not have to bother the orchestra with a deeper theoretical analysis.

MATH. Nevertheless I am glad that you acknowledge the function of music theory to prescribe 'performance 'features'.

LIST. That's fine! Shall we now continue with Beethoven?

(*After retuning their instruments, they turn to opus 18 number 5.*)[1]