

Lasse Thoresen © 2012:

**The Concrecence Project 2008-2010:
Ideas, processes, experiences, and musical works.**

**Extracts from a manuscript
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Introduction.

The *Concrecence Project* is an aesthetic research project oriented towards innovations in vocal practise and composition, through experiments with combining vocal techniques from different cultures. While all the singers involved have a thorough training in the Western classical approach to singing the project introduces Mongolian *overtone singing* (also called *Diphonic Chant*, or *Harmonic Chant*) and *Scandinavian traditional song styles* ("ethnic" techniques such as *kveding* and *kulning*). Both the overtone series and the ethnic models include pitches that are not found in the Western twelve tone equal temperament (hereafter referred to as 12-TET), and so *training in new interval classes* becomes integral to the project. A third approach to vocal music inspired by the French tradition of *Musique Concrète*, the *Jeux musicaux* was intended as a yet another component in the project, but was later removed for reasons to be later discussed.

The first phase of the Concrecence Project began around 2004. The performing vocal ensemble in this phase was the Norwegian sextet *Nordic Voices*. After two years of instruction and training, six new compositions were written for the ensemble and given a first performance during the *Ultima Festival* (Oslo) in 2006. A second phase of the project started in 2008, and ended autumn 2010. The present paper focuses on the second phase of the project, although a number of ideas evidently are in common for these two phases.

Opening new possibilities for vocal sound production would be meaningless without a concomitant development of compositional approaches. Not only singers, but a number of composers were involved. An important feature of the Concrecence Project was that the composers were not asked just to write new works; they were expected to attend a number of rehearsals and to some extent try out the new techniques with their own voices. Moreover, seminars for the composers were arranged after the choral rehearsals which the composers also attended. The lectures and discussions addressed issues such as the use of the overtone series, spectral chords, and the quasi modal structure and ornaments of the archaic Scandinavian music in modern composition. Questions of notation for overtone-singing, unusual voice qualities, and microtonality were also studied and discussed.

During the two Concrecence seminars a system of ear training aimed at increasing the singers' mastery of microtonality was being worked out and tested at the different sessions. To aid the work with intonation, a simple computer application realised in *Max Run Time (Mikropaletten)* was developed.

The seminars in Riga were often attended by additional students of composition, song, and choral conducting from the Jazeps Vitols Latvian Academy of Music in Riga. Moreover, seminars were arranged in Amsterdam during the TENS0 Days 2009.¹

The project was concluded with two public concerts with first performances given by the LRK. The first concert took place in Oslo September 2010 during the Ultima festival which for its last days had established collaboration with the TENS0 Days. During the festival the *Norwegian Academy of Music (Norges Musikkhøgskole, abbreviated as NMH)* arranged seminars for choristers and composers on Concrecence topics. The second concert took place in Riga October 2010 during the Arena Festival and presented more first performances by the other concrecence composers (Celma Liga, Kristaps Petersons, Gundega Smite).

¹ "Tenso is the European network for professional chamber choirs. It was founded in 2003 by conductors Laurence Equilbey and Daniel Reuss in order to reinforce, extend and promote choral practice in Europe and to contribute to the creation of new, innovative repertoire and ways to present it. In Tenso, the joint efforts and achievements of the most prominent European chamber choirs are combined and the results are made available within the context of a growing European network - thus actively contributing to the heritage and the scope of choral music in Europe."

The present papers will present ideas that animated the project, aesthetic preferences, musical materials, experiences, and a few glimpses of the works that were produced.

Organisation of the Project.

Lasse Thoresen, professor of composition at NMH, was the initiator and the artistic leader of the project. In addition to preparing the applications for financing of the project, and supervising the project, he was in responsible for the composition seminars and training of the composers involved. *Gro Shetelig*, Senior Lecturer at NMH, was in charge of the development of novel approaches to microtonal ear training. Dr. *Sven Ahlbäck* (professor at the Royal Swedish Academy of Music) and *Susanna Rosenberg* (Senior Lecturer at the Royal Music Academy of Sweden) were engaged as specialists in Swedish folk music. Professor Ahlbäck's research on tonality and modality in Swedish folk music is in the international forefront in ethnomusical research. Dr. Susanna Rosenberg is a singer who for years has been engaged in teaching folk singing to classically trained singers. *Christian Zehnder* (Swiss freelancer), one of the most sought after overtone singers of the international musical scene, was the main responsible teacher in overtone singing. Prof. *Valdis Muktupavels* (University of Riga) was engaged to give a first introduction to the subject. The singers of the *Latvian Radio Choir* (LRK) were the ones to be subjected to training by the above tutors. The choir was chosen mainly because it consisted of a stable group of professionally trained singers. (Excepting the Opera choir, Norway has got no professional choir with a full time employed crew; this was an essential reason why the LRK was selected as cooperation partner). The choir is one of world's leading chamber choirs consisting of 25 singers. The artistic leader of the process on the part of the Radio choir is one of the choir's two permanent conductors, maestro *Kaspars Putnins*.²

A number of composers from the Nordic/Baltic region were invited to compose for the LRK, availing themselves of the novel possibilities for vocal and choral writing. The composers were: *Celma Liga* (Latvia), *Kristaps Petersons* (Latvia), *Karen Rehnquist* (Sweden), *Lasse Thoresen* (Norway), *Toivo Tulev* (Estonia), *Martins Vilums* (Latvia/Lithuania), *Gundega Smite* (Latvia). Karen Rehnquist and Toivo Tulev, both professors of composition, were also engaged as lecturers for the composers' seminar.

The project, engaging three institutions in the Nordic/Baltic region, was able to secure most of its finances for the seminars with the LRK and the composers through funds reserved for seminars by *Culture Point*,³ an institution under the auspices of the Nordic Council. NMH took the responsibility for coordinating the finances of the project. The project, all contributions of all institutions included, was budgeted to have a total cost of around 190.000 €. The Nordic Culture Point eventually contributed € 32.000, which covered the fees for the seminars, travels, board and lodging. NMH accepted the project as part of 'Innsatsområde C', along with other projects devoted to musical innovation. The contribution of the NMH to the project consisted in a reduction of Lasse Thoresen's and Gro Shetelig's teaching responsibilities during the year the project took place. Moreover, NMH financed the development of the *Mikropaletten*, the programming of which was done by Mr. Klaus Sandvik.⁴ The fees for commissions came partly from the Ultima Festival (for Karin Rehnquist and Lasse Thoresen), partly from the Arena Festival (the other composers). NMH also took the responsibility for the financial management of the Project.

Ethnomodernism: a planetary perspective on composition.

The development of musical modernism after the Second World War was driven by the desire to get away from romantic music; and the means for doing that was experiments with new techniques of musical

2 The other conductor is Sigvards Klava

3 *Nordic Culture Point* (Kulturkontakt Nord) is part of the Nordic organization for cultural cooperation (NORDEN). The Concrecence Project received financial support from the 'Module for capacity development', which aims at "the organization and implementation of projects that develop competence in the field of culture and art, sharing of knowledge and expertise".

4 The program can be freely downloaded from: <http://www.lassethorsesen.com/concrecence/index.htm>

construction: first the twelve tone series and its extension to other parameters, later the computer algorithm, eventually acoustic/mathematical models deduced from analyses of the sound spectrum. However, most of the great composers of this era of European avant-garde music also took inspiration from ethnic or non-European cultures: Stockhausen and Boulez from the Far East, Messiaen from India, Ligeti from African rhythms and East European oral traditions, Berio from oral tradition around the Mediterranean, Scelsi and Grisey from the Asian music, Gubaidulina from Russian folk music; beyond these well known figures one cannot omit mentioning the composer who made acculturation more or less his main message: Ton de Leeuw.⁵ Stockhausen was the first to integrate Mongolian overtone singing into a work in the modernist tradition in his *Stimmung*.⁶ One may legitimately speak of *Ethnomodernism* as an undercurrent in European post war music. The developmental line of this approach owes much to the way that Bartok and Stravinsky used ethnic music from their respective cultural backgrounds to create novel musical expressions.

The Concrecence Project has made this aesthetic undercurrent its main profile. During the opening of the Concrecence seminar in Ultima 2006, I made the following declaration:

Welcome to four days of study and reflection on the possibility of making syntheses of vocal sound resources that are found in different parts of the planet earth! These resources of voice and sound are like deposits of fossil energy: Under the light of the universal sun, the plants of people's minds and ears have synthesized organic forms and materials and crystallized them. However, only in our days have the planet become so small that we can start to experiment with composing new entities by recombination of these cultural resources that have originated in geographic isolation. The idea of the Concrecence project is to make this planetary synergy of sound and music a fact, taking the human voice as our focus and our instrument.

The idea of creating such a project has been my dream for a long time; and as a composer I have felt the necessity to find another kind of human voice than the one traditionally cultivated in the Western classic music circles. Moreover, it seems to me, that while during the last thirty years, a variety of new techniques for playing musical instruments have developed enabling a great richness of sonorities to emerge, a similar thing has not yet happened with regards to the voice. The Concrecence Project is of course not the first in its kind; after all 'fusion' music has become a huge trend outside the classic music and avant garde music contexts. The project introduces this challenge into traditional Western classical and modern music, which exists in a cultural context characterized by rationally defined compositional techniques, systematic research and experimentation, the use of conceptual reflection, and of notation. Simply, I hope we will produce a new and fresh approach to vocal music and vocal composition in our particular cultural context.

A number of conditions, specific to the Nordic/Baltic culture can contribute to the uniqueness of the project: the sense of intonation found in Scandinavian folk music, combined with a general openness for the value of ethnic music in general. One could add that there is in our region still a sense of time that is close to organic nature, which often gives music from our region a distinct flavour. Moreover, in the countries involved, there is an openness to explore musical areas that are as yet unexploited by continental, established modernism. My appeal at the end of the opening address mentioned above is expressive of the hopes that I have for this project – hopes that certainly may involve a century or two of evolution before they become generally accepted as an integral part to our culture:

I have the hope for this project that it shall be a small beginning of something that eventually can be a contribution to a future, planetary civilization. This is why we start so close to the sound, so close to the body, so much in a point zero with regard to structural assumptions. This is the reason

⁵ See e.g. de Groot, R.1991. *Compositie en intentie van Ton de Leeuws muziek: Van een evolutionair naar een cyclisch paradigma*. Doctoral dissertation University of Utrecht. Amsterdam: University of Amsterdam,.

⁶ *Stimmung* was composed 1968 for *Collegium Vocale Köln*. It is written in *Just Intonation*. See footnote 10.

why I did not simply want composers to rationally conceive of structures that should be set to sound by performers – I did not want the traditional rational categories to be dominant right at the beginning. I wanted to give music itself a new beginning through the exploration of the possibilities of the voice, by considering the energetic, bodily aspect of sound, by taking the time to carefully consider simple givens, like the quality of voice, the nature of overtones, and let musical thought begin from this reset to what is almost a point zero. I wanted the music found in cultures that does not rationalize music in the same way as we do to be allowed to enter into another stratum of unfolding history, that of the unfolding rational civilization; a civilization which now is in fact defining the doxa of urban organization and life all over the world. I hope we shall develop something new and beautiful, indeed something *strangely* beautiful...

Our search for deeper sonic and structural rationales that may join impulses from different ethnic and cultural contexts in an organic synthesis is a process of letting ideas materialise into concrete result. In cosmology the *process* of concretisation is called Concrecence. The word *concrecence*, originally coined by the philosopher Alfred North Whitehead, describes the process whereby different aspects come together to form a collection of properties that characterizes any concrete entity in the physical world. We found the concept to fit with our ideas. Creative interaction among diverse approaches to the harmonic and energetic basis of music leads directly to rich new fields of musical consciousness and practice ready for exploration.

Over all ideas on sound: Matter, energy, and shape.

The scientific exploration of sound and sound spectra that was opened so many exciting vistas for music during the last 60 years, has also suggested a new perspective on tonality - one not yet theoretically dealt with – namely that Western Tonality is but a special case of more extensive concept of spectral tonality.⁷ The spectrum is normally an essential constituent of timbre. When timbre is dissolved through a process of fission, individual spectral components appear. In this border between spectral fusion and fission, there are fleeting transitions between harmony and timbre, as demonstrated by the music called spectral. The triad that is the basis of Western tonality emerges from the harmonic spectrum as its most evident and perceptually evident component. The scene is set for the development of *Spectrotonality*, a new orientation that synthesises a number of elements from traditional tonality, spectral analysis, central tones, and potentially *spectromorphology* into a new constellation.⁸ This, however, is a subject that cannot be further developed in the context of this paper.

The harmonic spectrum is in our insides: it is found in the sonic matter of the voice, to which the whole body serves as resonance. The working with the overtones of the voice brings out an image of column of energy raising itself from the chest via the throat and head and beyond. By decomposing the timbre of our voice, the spectral components can be made to emerge. This is exactly what overtone singing does.

Tones, spectra: these are *sonic matter*. Matter is what is tangible, sensible in an obvious way. Matter is the prerequisite for forms to be observed. The sensation of *forms and shapes* is *founded* or *grounded* in sonic matter. Further, sonic matter is the result of *energetic processes*: without energy, there is no sound.

In acoustic music a human agent provides the energy. The traces of energy observed in the sound itself will necessarily bear the signature of the human agent causing the sound. Through the energetic link the human body the sound itself can speak out the musician's will, feelings, gestures and intentions. We could make analogies with the way in which an instrument provides sounds. In the case of a violin the right

⁷ The exploration of the sound spectrum acoustically was a conquest of musical knowledge made at the end of the 70ies and 80ies. Information about the internal microelements of a single sound was translated into instrumental textures, chords etc, creating what is called 'Spectral Music'. The most well known pioneers of this music was Tristan Murail and Gerard Grisey. For insight into spectral music generally, see e.g. Barrière, J-B. 1991. *Le Timbre: métaphore pour la composition*. C. Bourgeois. I have developed an approach to compositional technique called Spectrotonality, in which the tonal universe is organized around central notes as the structural background or spectrotonic, while the interval content of the surface chords is derived from the interval contents of the spectrotonic.

⁸ In Spectrotonality the tonal universe is organized around central notes as the structural background or spectrotonic, while the interval content of the surface chords is derived from the interval contents of the spectrotonic.

hand provides energy to the strings through the instrumentality of the bow which then is intimately connected to the larger gestures of the human body. The left hand on the finger boards provides the pitches; the movements of the left hand are not so evidently gesture related, but absolutely necessary to produce pitches and melodic movements. Interestingly, the only concern of traditional music theory is that information which guides the placement and timing of the left hand fingering of the violinist; questions of the right hand, the provider of energy, have generally been overlooked. With the left hand, the performer will make manifest the result of a *rational* kind of mental activity *imposing itself on the sonic* forms of matter and energy to produce pitches. Most attention to musical composition begins with this rational aspect.

In the Concrecence Project we intend to address both the energetic and the structural aspects of vocal sound production on a more equal and integrated basis. To concern oneself with overtone singing involves the singer in a work with energy, bodily resonance possibilities, and new voice timbres. It opens another universe of intervals and intonation. Moreover, another component in the Project, the gesture-led vocal improvisations of Guy Reibel had a central place in its first phase.⁹ See figure 1.

Musical Concepti on

Human
body
providin
g
energy

Bodily actions controlling
structurally pertinent aspects
of the Sonic Matter.

⁹ See Reibel, G. 1984. *Jeux Musicaux*. Vol.1. Ed. Salabert. Video: *Le Jeu Vocal*.
<ftp://trf.education.gouv.fr/pub/educnet/musique/neo/04infos/parutions/jeuxvocaux/jeuxvocaux01.htm>

for sound
producti
on:

**Sonic
Energy**

Sonic Matter

Figure 1. Concept, Sonic Energy, Sonic Matter

In sound based music, i.e. music without absolute intervals, the play with the sound to create musical structures has gone in the direction of manipulating the energetic part of the sound production, thus has shifted from the right hand side of the figure to the left hand sign.¹⁰ While it is important in sound-based music, it is not impossible to conceive of an interval based music that incorporate an extended consciousness of the energetic aspects of the music. This is the aesthetic orientation of the Concrecence Project.

Overtone singing

Overtone singing is a technique of sound production prevalent in the northern regions of the Far East (Mongolia, Tibet). However, in some form or other it may also be traced in traditional music from Corsica and Sardinia, and Papua New Guinea. In a Western context, the technique was adapted and refined notably by *David Hykes*,¹¹ who prefers to call this way of singing *Harmonic Chant*, as for him the overall objective with his musical activity is tuning in on the greater Harmony of the Universe. *Tran Quang Hai*¹², a French/Vietnamese singer and ethnomusic researcher at Musée de l'homme in Paris, is another great capacity on overtone singing; he prefers to call it *Diphonic Chant*. Both the two above mentioned have been connected to the Concrecence Project through the years. Beyond these two, the technique of over tone singing has been adapted and described by e.g. Wolfgang Saus.¹³

Eventually the project engaged the Swiss overtone singer *Christian Zehnder*, an outstanding overtone singer with great international acclaim.¹⁴ He has an education as a traditional Western singer (baritone), and knows therefore very well how to bridge the gap between the traditional Western voice and production of overtones. After a short introduction by professor Mukstupavels, an overtone singer from Riga, Christian Zehnder took over the work of instructing the choir singers in overtone song.

¹⁰ We define an 'absolute interval' as *an objectified, transposable difference between sounds. In addition, there is a culturally shared agreement about the perceptual criteria that define this differential quality.* The pitch classes of Western art music belong to this category, as well as rhythms based on (some kind of) periodicity. The difference between *f* and *ff*, however, does not form an interval, as this difference, although definable in acoustical terms (e.g. as 6 Db) is not *perceived* as having the same objectified quality as that between its *p* and *pp*.

¹¹ See: <http://www.harmonicworld.com/>

¹² See: <http://tranquanghai.info/>

¹³ Saus, W. 2006. *Oberton singen : das Geheimnis einer magischen Stimmkunst.* Battweiler: Traumzeit Verlag

¹⁴ See: http://www.zehndermusic.ch/cms/front_content.php?idcat=89

Christian Zehnder's basic approach to singing – corresponding to the two other persons mentioned – starts with defining two basic strategies for defining overtones. One he calls *ng* – technique, the other *birrd*-technique (the rr pronounced with a broad American accent). In both cases the singer uses a lowered soft palate, so that a considerable part of the sound and energy passes through the head/nose. In the case of *ng*-technique, the pitches are filtered out and separated through the oral cavity, shaping it in the same way as one pronounces different vowels. In the *birrd* technique, the tip of the tongue is raised and held up against the hard palate, so that the oral cavity is divided into two parts. Overtone pitches can then be separated by moving the position of the tip of the tongue. The *birrd* technique is best suited for the higher overtones. The singer when passing from lower to higher register may rehearse to combine the two techniques in a smooth way.

After having learnt to separate the individual overtones, the next step is learning to fix them, that is avoiding an uncontrolled slide from one harmonic to another. In this process the singer also has to learn their numbers of the harmonics; the numbering used in our project is that of the *partials*, i.e. the fundamental is counted as number one.¹⁵ The next step is starting to make melodies on a fixed fundamental. Beyond this, it is possible to start rehearsing parallel movements of fundamental, shifting fundamentals under a common overtone, making controlled leaps between different intervals in both fundamental and overtones in parallel or contrary motion, and eventually to create a mix of all these approaches. Figure 2 shows a summary of the steps:

Summary of steps in learning overtone singing	
1.	Learning to bring out the sound of the overtones, using either <i>ng</i> or <i>birrd</i> techniques. Gliding between overtones.
2.	Learning to separate the overtones distinctly and hold them fixed. Learning to identify the partials by their number.
3.	Learning to make simple melodies with overtones over a single fundamental,
4.	Learning to shift fundamental and overtones in parallel, with a fixed interval between them.
5.	Learning to shift fundamental under an overtone in common to the fundamentals. This involves singing subharmonic intervals, i.e. intervals that are the exact inverse of the intervals produced by the overtones
6.	Making leaps in overtones and fundamentals simultaneously, in parallel or contrary motion
7.	Changing between the above techniques in a controlled way

Fig. 2. Summary of steps, overtone singing

The vocal production of overtones has a certain absolute limit, approximately four octaves above the middle C. The higher the fundamental is placed in the tessitura, the fewer are the overtones that can be produced. Accordingly female voices can produce a smaller number of overtones than male voices. The melodic

¹⁵ By numbering the harmonics as partials, one obtains a numerical equivalence between the numbers of the harmonic and their frequency ratios. Eg. the frequency relationship between the fundamental and its first overtone is a 2:1 relationship – a ratio that defines the interval of the octave. In similar way all the successive intervals are defined by a frequency ratio, e.g. the fifth as a 3:2 ratio; the fourth as a 4:3 ratio; the major third as a 5:3 ratio etc. The knowledge of the ratios helps computing intervals, finding their difference tones, calculating new intervals that resulting from adding or subtracting intervals one to the other etc.

possibilities of the overtones are first of all between partials 6 to 12, then more exceptionally those from 12 to 16; however, female voices seldom reach above partial 10.

During the first Conrescence project I developed a notation of overtone singing that I consider as being clear and unambiguous. I proposed the approach also to the composers of the present project, but few adapted it. My proposal, anyway, would generally be to notate the fundamental and the overtone in two systems so that the first overtone over a (new) fundamental is connected to it by a vertical line going from the middle between the note-heads of the fundamental and the overtone. In addition, the overtone-part has a flageolet circle above it; and the first occurrence of an overtone is marked with its partial number (figure 3a). More compact representation in only one note system can also be used (figure 3b).

The image displays a musical score for six vocal parts: Soprano (S), Mezzo (M), Alto (A), Tenor (T), Baritone (Br), and Bass (Bs). Each part is written on a two-staff system (treble and bass clefs). The notation includes fundamental notes and overtone notes. The overtone notes are connected to the fundamental notes by vertical lines, and a small circle (flageolet circle) is placed above the overtone note. The first occurrence of an overtone in each part is marked with its partial number: 3 for Soprano, 4 for Mezzo, 6 for Alto, 7 for Tenor, 8 for Baritone, and 9 for Bass. The score is organized into measures, with a double bar line and repeat sign in the middle of each system.

Figure 3a. Examples of notation of overtone singing.



Fig 3 b Examples of notation of overtone singing.

Overtones and microtones: Choice of microtonal nuances.

The sound of a voice that produces a pure pitch has got a harmonic spectrum hidden in its timbre. The harmonic spectrum can be filtered out as a series of pitches; the intervals between these pitches do only to a certain extent correspond to the pitches defined by the equally tempered twelve tone scale. In fact, every successive interval in the overtone series is different. When the intervals of the overtones shall be projected back into the domain of fundamental pitches, a modification of the system of the twelve equally tempered tones (hereafter referred to as 12-TET) of Western classical music becomes a matter of consistency. Thus the definition of other interval classes than those found in a normally tuned key board becomes imperative. By the term microtonality, then, we refer to all interval classes that deviate from the 12-TET; the term does not by necessity imply the use of very small intervals. Given the primacy of the over-tone series in defining harmony, both in the context of Western classical music, and the context of the Concrecence Project, it is consistent, then, to take the pitch classes of the overtone series as defining categories.

However, since we in the context of Western classical music have got the 12-TET as the point of reference for notation, a set of accidentals that modify the temperature into the appropriate, new pitch classes will be used.

We have in general, then followed the Just Intonation pioneer, *Harry Partch*, and have used only the intonation deviations from 12-TET that occur among the first 11 partials as our reference (referred to by Partch as the 11-limit).¹⁶ The interval class that most evidently differ from Western intonation is the interval 12:11 (twelve is in fact the same pitch class as number three, only two octaves above, so we do not exceed the 11 limit by using the number twelve). This interval measures approximately 50 cents, i.e. the half of the distance between the normal, chromatic intervals and is notated as a quarter tone deviation from 12-TET. The next major deviation from the 12-TET is the 8:7 interval. It is 33 cents larger than the ordinary major second. The deviation of appr. 30 cents, then, will be defined by yet another accidental (an arrow attached to a normal accidental). The deviation of the 7th harmonic is lower, so the arrow will be pointed down, however, by turning the arrow upwards, we can define yet another set of new interval modifications. Finally, the 5th partial, the major third in relation to the fundamental, can be denoted by a small minus sign added to an accidental, since the 5:4 interval is approximately 15 cents lower than a 12-TET major third. The inverse modification would logically be a plus sign. Figure 4 shows the list of accidentals employed.

- # - Pitch lowered by 15 ct
- ♭↓ - Pitch lowered by appr. 33 ct
- ♯↑ - Pitch raised by appr. 50 ct
- ♭ - Pitch lowered by appr. 50 ct
- ♯ - Pitch raised by appr. 50 ct

¹⁶ Partch, H. 1949. *Genesis of a Music*. Madison: University of Wisconsin Press. Tuning systems based on the pure overtones such as that of H. Partch are often referred to as *Just Intonation*.

Figure 4. Microtonal accidentals

With the accidentals chosen (indicating deviations of approximately 50, 30 and 15 cents either up or down) we can notate with acceptable approximations a great number of harmonic partials. Figure 5 shows a list of the partials up to n. 48, and a specification of the number of cents that a partial notated by our accidentals differ from the theoretically pure overtones.

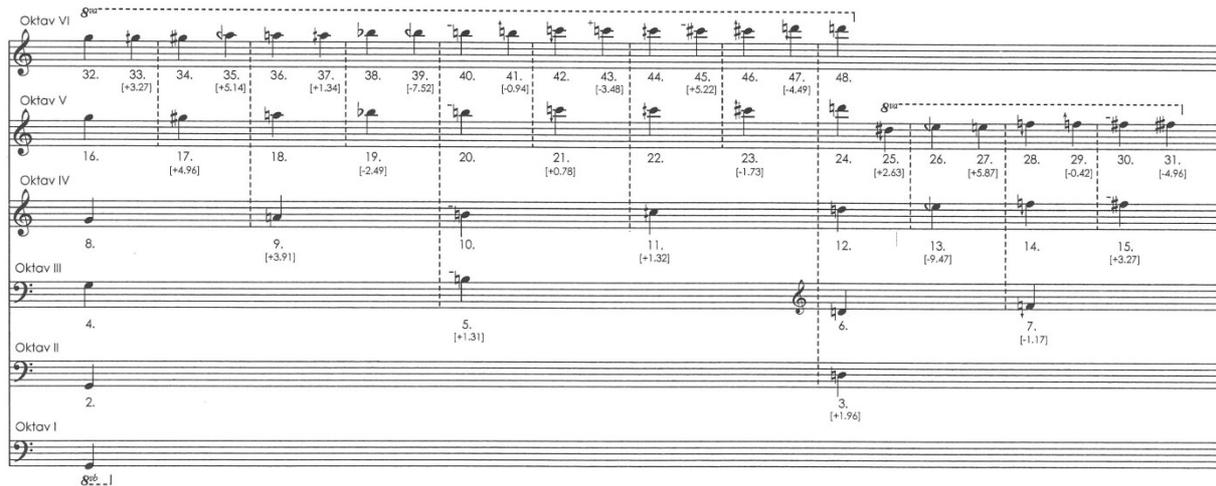


Figure 5.

The same accidentals will also be applied for the rendering of microtonal nuances in ‘ethnomusical’ modes. In Norwegian folk music, the fourth scale degree is often raised so as to correspond to the 11th harmonic (a quartertone deviation), the third scale degree may be neutral (exactly between major and minor, thus usually notated by a quarter tone lowering of the major third); in other cases the minor may be bright, but not as high as a neutral third, so the 30 cent up accidental will be used indicate the raising of the minor third. The normal position of the seventh scale degree, when used as a leading tone in the lower register, is one app. 30 cents above the 12-TET lowered seventh degree.

When microtonal intervals are used in clearly audible contexts, such as in folk music or in chords, the quarter-tone intervals stick out as a very distinct intervallic quality. In terms of musical perception, a number of new interval classes may be formed using the quarter tones. On the contrary, the lesser deviations, such as that of 30 cents, usually only creates the sensation of a brighter or darker nuance of the interval. This perception is reflected in the design of the accidentals in such a way that entirely new looking signs are used for the quarter tones, whereas minor nuances are indicated by arrows etc. that modify an existing accidental. The meaning of the slighter deviations in folk music is as a matter of fact not strictly bound to scales and fixed tuning standards; they are a context sensitive commodity with clearly expressive function¹⁷.

Aesthetic choices: Overtone intervals, modes.

While the music of ‘microtonal intervals’ is the normal situation for all music excepting Western classical music, in Western music the question of fine tuning of the intervals remained closed after the 12-TET-tuning became standard sometimes early in the 19th century. The field was opened again in the first half of

¹⁷ See: Sevåg, R. (1974). Neutral Tones and the Problem of Mode in Norwegian Folk Music. *Studia instrumentorum musicae popularis III. Festschrift Ernst Emsheimer*. Stockholm.

the 20th century by composers such as Wyschnegradsky, Haba, Partch, Groven, Carrillo. After the Second World War, uses of microtonal nuances have become much more common place in the avant-garde-music of e.g. Penderecki, Lutoslawski, Xenakis, Ligeti, Murail, and Grisey. On close scrutiny it turns out that the rationales for using microtones differ greatly. Some composers, such as Haba, simply expanded the number of degrees in the chromatic scale, and went on to compose in a rather traditional way with the new scales. For others, such as Penderecki and Lutoslawski and Carrillo, the quarter-tones were used to create dense clusters, or to give precise indications for the design of glissando textures, and also to create new chordal timbres. For composer making sound-based music (i.e. a music that avoided defined interval categories) the quarter tones gave a way to efface the sensation of specific interval relationships (e.g. Xenakis). For yet other composers, the interest was a return to a real pure intonation based on the harmonic series (Partch; Groven), or the introduction of ethnomusical modes (Groven). Composers like Murail and Grisey who worked with the acoustically defined spectrum, and also the Norwegian microtone pioneer Bjørn Fongaard, expanded the pitch space to a continuum while eliminating altogether the idea of having a fixed scale as a fundament for pitch construction. Accordingly, for them the choice of microtonal nuances became a question of finding suitable approximations to a pragmatically defined grid of microtonal nuances related to the 12-TET; in deciding the size of the grid the question of playability becomes a consideration.

In contrast to intonation aesthetics that aim at the elimination of specific intervals qualities, the basis for the use of microtonality in the Conrescence Project was an interest in preserving the interval as a pertinent element of music; instead of we would like to work with new interval classes, or with microtonal colorations of existing interval classes. For intervals to be pertinent in a structural context constraint is necessary.¹⁸ Our models for microtonal intervals and compositional strategies, then, have mostly been taken from Just Intonation, Spectral Algorithms, and Ethnic Modes, often attempting syntheses between these three approaches.

Since it is mostly the quartertone based intervals that form perceptually new interval classes, a particular focus on which of these intervals can be internalized both with performers and listeners becomes important. Our conclusion so far has been that the intervals one could categorize as *neutral*, i.e. the intervals that fall exactly between the intervals usually named major or minor (neutral seconds, neutral thirds, neutral sixths, neutral sevenths) are particularly approachable. To this list, we would moreover add the quartertone high fourth (11:8) and the quarter-augmented second (appr. 7:6 or 8:7). Excepting the quarter-augmented second, the other intervals are the ones that most often occur in the folk music of Norway and Sweden.

Reflections on microtonal intervals and choral singing: constraints and possibilities

Microtonal intervals pose a particular challenge to singers, one which they to some degree shared with other instruments with a flexible intonation such as string instruments, flutes, saxophones, trombones. For an interval to be intoned exactly, it is necessary that the singer/performer has got a precise *aural conception* of the interval they are about to perform. If on the contrary a performer aims 'a little higher' or 'a little lower' than what they are used to, the result will often give an impression of uncertainty since more often than not, the singer will adjust the intonation of her pitch shortly after it has been reached. A prerequisite then, for a new performer standard is an ear training program directed towards the mastery of new interval classes. In the Conrescence Project, asst. professor Gro Shetelig took upon herself to work out a system of microtonal ear training; this will be the subject of a separate paper written by her.

The fact that a performer's, and in particular a singer's capability of performing an exact microtonal nuance is limited, will have to be taken into account by the composer. Seen in a musical context it is evident that the faster a musical passage moves through a certain pitch, the less exactly can its nuance be performed, or aurally appreciated. Thus the application and choice of microtonal accidentals will to some degree be a function of the musical context. The finer the adjustments are (e.g. the adjustment for the pure major or minor thirds as opposed to their 12-TET versions), the less they should be used in quick tempi. The accidentals, then, are in accordance with the applied nature of our project almost always to be regarded

¹⁸ For a discussion of the constraints of the human brain in processing information in real time, see Snyder, B. 2000. *Music and Memory. An Introduction*. Cambridge, MA: The MIT Press

approximations, not as absolutes. Their absolute definition remains a theoretical ideal, which hardly ever is attainable in the world of musical praxis.

Moreover, since a microtonal nuance is usually not part of the (Western) listener's repertoire of interval categories, a microtonal nuance of importance need to be repeated (preferably in the same octave register), so as to confirm the intended interval category and avoid the sensation of a sloppy performance. In the melodic domain, such an insistence on the quality of an intonation nuance favors a modal approach to composition, i.e. one in which a particular scale degree always has the same microtonal nuance when occurring within the same melodic formula. In accordance with modal logic the nuance of the scale degree may vary depending on the melodic context, while the microtonal nuances of the scale degree would never occur one after the other as in a 'chromatic' setting. The idea of 'tone-places' in Scandinavian folk music gives an adequate model explaining the modal logic that underlies much archaic Scandinavian folk music – a model conception that anyway does not define exactly intoned scales as the fundament from which pitches are selected.¹⁹ The fluidity of this approach to pitch and interval formation comes actually in some respect closer to the spectral conception of the continuous pitch space.²⁰

While singing microtonal intervals is generally difficult, the unison singing of microtonal intervals is a particular challenge. In order to test the possibilities for microtonal unison singing I wrote an etude with neutral thirds, sevenths and sixths.²¹ LRK had earlier managed to perform frightfully difficult microtonal scores. But since it is a chamber choir, the microtones usually have been given to solo singers, a procedure that provides a greater leeway for a slightly aberrant intonation, and avoids the unpleasant sound of false unisons. The tests with LRK concluded that with considerable rehearsal time, unison singing of neutral intervals in a rather conservative, modal melody (only neutral intervals) with no big interval leaps could be within reach. However, the singers begged – after having got accustomed to this highly unusual interval atmosphere - that music in this style should not be performed shortly before or after music with 'normal' intonation. In the end none of the composers ventured into writing extensively unison melodies with quartertone intervals.

Changing vocal timbre

If microtonal intervals are to be appreciated for their special qualities, the tone supporting the pitch must be very precise in intonation; this implies that practically no vibrato can be used. For many singers this means an obstacle; fortunately, the pedagogues teaching modern classical singers today seem generally to have advised their student to a degree of caution in this respect. Neither the singers involved in the first Conrescence Project, the Nordic Voices, nor the singers of LRK, seemed to have difficulties in controlling the extent of their vibrato.

The two ethnic techniques of overtone singing and *kulning* posed more serious challenges. The latter song style (called *kulning* in Sweden, *Ku-lokk* in Norway) was used in rural district to call domestic animals roaming in the mountains or the woods back home; so it is a manner of singing designed to be heard of very long distances and is done with an extremely shrill voice timbre. The vocal timbre in the high tessitura differ very much from that of the lower tessitura, and the position of the larynx moves from very high to very low - quite in contrast to the Western singing technique that favors a homogenous timbre produced by low larynx. Susanne Rosenberg's turned out to have a number of useful pedagogical approaches for the singers to appropriate this style of singing.²²

19 The model of 'tone places' is elaborated by dr. Sven Ahlbäck who presented it to the composers at the Conrescence Seminar in Riga. See Ahlbäck, S. 1995. *Karaktäristiska egenskaper för låttyper i svensk folkmusiktradition*. Stockholm. (Information on publisher not available.)

20 See e.g. Thoresen.L.2002. *Fliessende Töne, fliessende Zeit*. Program book for the MAGMA2002BERLIN Festival.

21 See Conrescence Web Page: <http://www.conrescence.no>

22 See <http://www.susannerosenberg.com/> for further references to her work.

The Norwegian kveding style usually employs chest-voice²³. A Western singer will also use this voice in the lower register, but it does not extend to higher tessitura. It is considered anatomically impossible to extend the chest voice in high register; however, there is evidence this is humanly possible.²⁴ The chest voice sound can also be realized in higher middle register by a slightly different technique called 'belting'.

The process of learning to produce overtones also puts a new focus on vocal timbre. Before the vocal sound breaks into two aurally separate strata, there is a phase in which vowel formants resonate more loudly; this is brought about through nasal resonance (lowering the soft palate). With higher sub glottal pressure, the position of the larynx also has got a tendency to rise, which produces a sharper sound (in the direction of an oboe, if one would compare the normal position of the larynx lies close to a flute).

The changing of the brightness of the spectrum of the vocal tone can be compared to the changing of the bowing position on a string instrument (*sul tasto* i.e. placing the bow close to the finger board: producing a soft timbre with few overtones; *ordinario*, i.e. placing the bow in the middle between the finger board and the bridge, producing the normal string sound; and *sul ponticello*, i.e. placing the bow close to the bridge, producing a very sharp and spectrally saturated timbre). Contemporary composers have increasingly wanted to have control of the timbral aspect of music, and today the ability of the performer to change between these positions is a standard technical requirement. This is in a certain contrast to the classical ideal that taught that only one specific position was beautiful, hence acceptable.

Similar considerations apply to the choice of timbre of the human voice. The *Bel Canto* ideal that we all know from the romantic opera has set one specific ideal as the 'natural' way to sing. Timbres from folk music (non vibrato chest voice, belting) are often considered not only ugly, but even harmful. There is therefore considerable reluctance among classically trained singers to change their voice timbre beyond the accepted standard. A flexible approach to vocal timbres would e.g. mean that the singer should be able to control the height of the larynx in the vocal tract.

Despite considerable skepticism I have chosen nevertheless to encourage singers to acquiring the capacity of changing the vocal timbres of the singing (apart from other timbre productions such as whispering, whistling etc.). I defined voice-timbres of three kinds: chest-sound, high larynx; normal voice; very low larynx, somehow fluffy sound.²⁵

Compositions.

The project resulted in 6 compositions written for LRK, here listed in alphabetical order:

Liga Celma: *Desbesu seta*. (11'); Kristaps Petersons: *Beauties (6'40") I. Red-haired beauty. II Blonde beauty*; Karin Rehnquist: *Tenebrae (9'35")*; Lasse Thoresen: *Mythes étoilées (27') : I: Voici l'heure II: Ombres et Images III. Une miraculeuse Présence*; Toivo Tulev: *Tanto gentile*. (11'41"); Gundega Smite: *Qots (Dzelknis) (Thistle) (4'44")*; Martins Vilums: *Gaw ek dad kard (12'18")*

Excerpts of these compositions and scores are uploaded to the Concrecence web page:

<http://www.lasethoresen.com/concrecence/index.htm>

Ending Note

The challenge of the Concrecence Project is its continuation. The more singers that acquire the new capacities involved and the more composers that write for these vocal possibilities, the more will the project influence the future course of vocal music. One step towards this would be the development of a high quality website that documents systematically the voice pedagogic and ear training that lead towards such a

²³ The chest voice is a very general term for the sound and muscular functions of the speaking voice, singing in the lower range, and the voice used to shout.

²⁴ I refer in particular to the singer Berit Opheim Versto, as documented by the recording of my composition *Chases, Cattle Calls and Charts*. Aurora ACD 5042.

²⁵ The signs that were developed for timbres and sound production, both in my piece and that of Martins Vilums, are displayed on the Concrecence Web Page.

result. This will be a possible next phase in the development of the project, provided that the Project obtains sufficient financial and administrative support.