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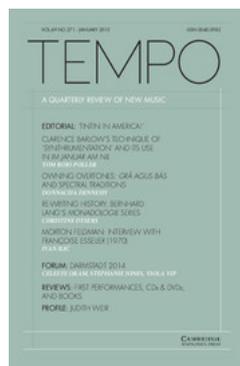
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## CLARENCE BARLOW'S TECHNIQUE OF 'SYNTHRUMENTATION' AND ITS USE IN *IM JANUAR AM NIL*

Tom Rojo Poller

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**Abstract:** 'Synthrummentation' is a technique for the resynthesis of speech with acoustic instruments developed by the composer Clarence Barlow in the early 1980s. Over the past decade instrumental speech synthesis has been thematised by a diverse range of composers (e.g. Peter Ablinger and Jonathan Harvey); however,



Clarence Barlow. Photo by Birgit Faustmann. Used by permission of Clarence Barlow.

Barlow's work is rarely accorded the credit it deserves for the pioneering role it played in this field. This article seeks to explain the basic mechanics of the synthrummentation technique and to demonstrate its practical application through an analysis of Barlow's ensemble piece *Im Januar am Nil* composed between 1981 and 1984. It should become apparent that Barlow never uses synthrummentation in its conceptually pure form, but rather its realisation is always integrated into an overarching musical context, which reflects Barlow's general approach to musical invention allowing different factors to interact.

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### Introduction

Clarence Barlow has always gone his own way. At the end of the 1960s he decided to leave his home town of Calcutta, India, where he was born in 1945 into the English speaking minority, and moved to Cologne to study with the many prominent figures of the new music scene who were working there at the time. He first studied with Bernd Alois Zimmermann and Mauricio Kagel, but later – together with composer friends such as Walter Zimmermann, Claude Vivier and Kevin Volans – began to position himself outside the new music mainstream, by adopting an increasingly critical, satirical and often ironic distance to accepted conventions. Almost on his own, he became a pioneer of algorithmic music, exploring the potential of computer-aided composition with the help of the many software tools he has been developing since the 1970s. And even though today Barlow is generally recognised as a groundbreaking figure in the field of computer music by his peers, many of his ideas and

concepts, which are for the most part inextricably linked to his software development and the numerous pieces (which were without exception the impetus for Barlow's programs), are still awaiting their due reception from the broader musical community. This is particularly true of the subject of this article: Barlow's technique of instrumental resynthesis of speech, which he has termed 'synthrummentation', and its use in the piece *Im Januar am Nil*.<sup>1</sup> Although the idea of instrumental speech synthesis has been effectively brought to a wide public in a diverse range of compositions (prominently in Peter Ablinger's series of works *Quadraturen III* for player piano from 2004<sup>2</sup> as well as Jonathan Harvey's orchestral work *Speakings* from 2008, which was based on advanced live-electronic techniques developed at IRCAM<sup>3</sup>), in most cases neither the creators of these works nor their audience referred back to Barlow's technique of synthrummentation, which had already been developed in the 1980s, and which can be seen as playing a pioneering role due to its comprehensive, systematic and computer-aided exploration of instrumental speech synthesis.<sup>4</sup> The large, almost 30-minute ensemble piece *Im Januar am Nil* has also – completely unjustifiably – not been heard live since the first performances in the 1980s, and it is known only by a few new music enthusiasts. The present article thus has two main goals: to highlight a technical process and compositional technique whose conceptual core still plays a pivotal role in contemporary compositional discourse – perhaps even more so today than ever before – and to come to terms with an important composition based on speech, the analysis of which will show how Barlow used the technique he developed in his own unique and original way.

### Synthrummentation

Barlow's coining of the term 'synthrummentation', a portmanteau that blends together the semantic fields of 'synthesis' or 'synthesizer' and 'instrumentation', does not only reflect his keen, subtle and indeed (self)-ironic inclination to language games of all sorts. Above all, it highlights the fact that a standard term for the particular phenomenon of instrumental speech synthesis is lacking in the general vocabulary of musical terms currently in use. Barlow's neologism calls up reference systems that already hint at the theoretical roots of the concept: both computer-aided sound synthesis and the theory and practice of instrumentation are determined to a great degree by technical aspects. It is therefore not surprising that when Barlow described his process of synthrummentation in an article from 1998, he chose to do so in explicitly technical terms as 'Additive Synthesis th[r]ough Musical Instruments' for the purpose of generating 'approximated reproduction of speech sounds solely by acoustic instruments'.<sup>5</sup> This definition

<sup>1</sup> The score of *Im Januar an Nil* was originally published by Feedback Studio Verlag in Cologne. The company was reluctantly closed by its owner, Johannes Fritsch, shortly before his death in 2010. The decision regarding a new distributor of Barlow's work is currently under discussion.

<sup>2</sup> See <http://ablinger.mur.at/docu11.html> (accessed 23 August 2014).

<sup>3</sup> See Gilbert Nouno, Arshia Cont and Grégoire Carpentier, 'Making an Orchestra Speak', <http://articles.ircam.fr/textes/Nouno09a/index.pdf> (accessed 23 August 2014).

<sup>4</sup> James Tenney's *Three Indigenous Songs* (1979) for two piccolos, alto flute, tuba (or bassoon) and two percussion must be mentioned here as an important predecessor. However, it is based on an approach that is conceptually clearly simpler and was moreover not realised with the help of a computer.

describes in a nutshell the entire process, which Barlow elaborates in the rest of the article by breaking the translation process down into individual compositional steps. In the first step, the spectrum of an audio signal, in this case spoken words, is analysed using a fast Fourier transform.<sup>6</sup> In the second step, the spectral analysis then serves as the basis for the resynthesis – the instrumentation or orchestration for any number of acoustical instruments. Depending on the complexity of the spectrum and the number of instruments available, a more or less representative selection of the source spectrum has to be made. Moreover, several general factors must be considered when selecting the speech source (avoiding noisy and therefore spectrally complex consonants) as well as when choosing the instrumental timbres (to correctly represent the spectrum the sounds used should have as few overtones as possible).

Although this summary may sound like a description of a compositional recipe, it cannot be divorced from its conceptual underpinning. The key idea is that, although the resynthesis principle could be easily applied to other acoustical phenomena, the focus here is placed explicitly on the reproduction of speech. The goal is to create a sonic likeness of the source material ('approximated reproduction') that has the potential to be recognisable as speech.

In Barlow's oeuvre, *Im Januar am Nil* is the composition in which synthrumentation is most fully realised, which is why Barlow himself continually returns to it as the first example to illustrate his synthrumentation concept. Its specific compositional realisation will be looked at in more detail the following analysis. This will demonstrate that on both the structural as well as perceptual levels of the composition, synthrumentation acts as *one* component among others, principally responsible for the parameter of timbre, while melody, rhythm and form are determined by other construction principles that are in no way derived from the synthrumentation technique.

### Analysis of *Im Januar am Nil*

#### *Basic elements: Spiral melody*

A bass melody, which represents a constructive level that is independent of the synthrumentation process, continues through the entire piece. [Example 1](#) shows its basic form, which enters for the first time a few minutes into the piece, but which, according to Barlow,<sup>7</sup> was the starting point of the melodic generation.

The D modality and prominence of small intervals (mainly seconds and some minor thirds) in the form quoted here lend the melody a quasi-vocal cantabile character. However, this particular incarnation of the melody is a mere snapshot, as it undergoes a prolonged development on several different levels over the course of the piece.

<sup>5</sup> Clarence Barlow, 'On the Spectral Analysis of Speech for Subsequent Resynthesis by Acoustic Instruments', in *Festschrift Georg Heike*, ed. Bernd J. Kröger (Frankfurt a. M.: Hector, 1998), pp. 183–90, here 184.

<sup>6</sup> A fast Fourier transform (FFT) calculates the spectral energy present at each partial of the fundamental frequency of the FFT, which is determined by dividing the sample rate by the FFT frame size in samples. This means that a single FFT only returns an accurate result when analysing exactly one cycle (or an integer multiple of cycles) of a tone, therefore most sound sources will produce a large amount of artefacts. To correct for this two or more overlapping FFTs are usually applied to the sample giving a much more accurate representation of the spectrum.

<sup>7</sup> Cf. unpublished transcript of a lecture held at Johannes Gutenberg University, Mainz, on 6 February 1998.



Example 1:  
Basic form of the bass melody from  
Barlow, *Im Januar am Nil*

**Table 1** illustrates the structure of the temporal-procedural level of the melodic generation.

In total the melody completes 24 cycles or 'generations', where each generation increases its duration by 24 beats or 12 seconds as the tempo of the 6/8 bars is 120 BPM for the dotted crotchet. At the same time, the number of notes increases in each generation according to the formula  $n^2$  where  $n$  stands for the cycle number, and this is designed so that the difference to the preceding generation becomes larger with each iteration. The difference between the number of notes and the generation's duration yields the number of empty beats.<sup>8</sup> At first the number of empty beats increases, although the difference to the previous generation decreases by 2 each time until – exactly in the middle, between the twelfth and thirteenth generation – the number of empty beats begins to decrease, until in the end there are no free beats left.

The durational structure of the melody generation therefore exhibits a chiasmic characteristic: the temporal expansion of each subsequent generation increases the melody's overall duration while the melody simultaneously becomes denser due to the increasing number of notes. In his analysis of the melodic construction in *Im Januar am Nil*, Diethelm Zuckmantel proposes the term 'spiral melody' to describe this basic dual trajectory.<sup>9</sup> Just like a spiral, the melody originates in a single point, a single note, and then grows cyclically by twisting ever tighter in on itself.

However, it is not only the temporal construction but also the pitch structure of the spiral melody that obeys a procedural, developmental logic. On a perceptual level this can be described quite easily. Starting from a single D, the basic modal-vocal gesture is established up to and including the ninth generation, where the melody quoted in **Example 1** appears in its entirety. Due to the increased rhythmic density and the changing intervallic structure, the melody begins to dissolve, gradually taking on the characteristics of amodal or atonal instrumental music with large intervallic leaps and a lack of a clear tonal centre. On a structural level this seemingly simple process is driven by a

<sup>8</sup> In this context the term 'empty beats' means beats on which no new note begins, and therefore is not equivalent to a rest. On the contrary, the notes of the melody are generally held until the entry of the next note.

<sup>9</sup> Cf. Diethelm Zuckmantel, *Der Riss in der Emailleurne: Über die strukturbildenden Prinzipien der Spiralmelodie in Klarenz Barlows "Im Januar am Nil"* (unpublished theoretical study submitted in support of a *Diplom* in Composition at the Robert Schumann Hochschule, Düsseldorf, 1987).

Table 1:  
Scheme of the spiral melody in Barlow, *Im Januar am Nil*

Generation	Beats	Number of notes	Increase in the number of notes	Empty beats	Increase/decrease in the number of empty beats
I	24	1	+1	23	+23
II	48	4	+3	4	+21
III	72	9	+5	63	+19
IV	96	16	+7	80	+17
V	120	25	+9	95	+15
VI	144	36	+11	108	+13
VII	168	49	+13	119	+11
VIII	192	64	+15	128	+9
IX	216	81	+17	135	+7
X	240	100	+19	140	+5
XI	264	121	+21	143	+3
XII	288	144	+23	144	+1
XIII	312	169	+25	143	-1
XIV	336	196	+27	140	-3
XV	360	225	+29	135	-5
XVI	384	256	+31	128	-7
XVII	408	289	+33	119	-9
XVIII	432	324	+35	108	-11
XIX	456	361	+37	95	-13
XX	480	400	+39	80	-15
XXI	504	441	+41	63	-17
XXII	528	484	+43	44	-19
XXIII	552	529	+45	23	-21
XXIV	576	576	+47	0	-23

complex set of rules, a detailed analysis of which would be beyond the scope of this article. Roughly speaking the process is based on three basic operations: setting, splitting and exchanging. In each generation a note of the melody could either appear as if coming out of nowhere (setting), or a note of the melody from the previous generation can branch into two notes over two beats (splitting) or a note could be replaced in the next generation with another note (exchange) and this will then be carried forward through the generations. The fact that these three basic operations are not applied in a free manner in the composition but are each based on a comprehensively formulated set of internal rules (which is, among other things, related to Barlow's theories of harmonicity) testifies to the precision and omnipresence of Barlow's constructive thinking. In terms of the musical effect, the process clearly serves a simple purpose in this case: the initial and final forms of the spiral melody should establish two contrasting poles, which – when seen in isolation – seem to bear no resemblance to one another, but this resemblance reveals itself on a subliminal level through the transformative coherence of the logic inherent to the process, suggesting that a single overarching principle of melodic construction is at play.

#### *The synthrummentation process*

The speech material that serves as the starting point for the synthrummentation process has nothing to do with the melodic construction detailed above, nor is it connected to any other semantic or structural elements in the composition; rather, the text was created solely with a view for its suitability for the synthrummentation process. Specifically it consists of sentences that Barlow himself formulated and recorded himself speaking. These sentences – in line with the aforementioned premise that phonemes with a harmonic spectrum are easier to resynthesize with instruments than inharmonic spectra – were built exclusively of vowels and labial or nasal consonants. Due to the phonetically restrictive selection criteria and the limited range of possible vocabulary, the sentences generated, which are without exception grammatically well formed, come across as decidedly Dadaistic or Surrealistic, as in 'Urahnen meiner Oma im Innern einer Emailleurne einleimen';<sup>10</sup> or, in a particular stroke of linguistic virtuosity, 'Ohne Ahnung nahm ein Urnormanne eine enorm anglomane Alemannin in eine Eheunion, amen alleluia'.<sup>11</sup> (Incidentally, the title of the piece is also derived from one of these source texts, namely 'Im Januar am Nil Mumien anmalen'.<sup>12</sup>) The composition of the speech source material therefore followed no semantic calculus; rather, it was primarily designed to yield an optimal acoustic transmission which allowed the linguistic form to be stripped of its conventional functionality.<sup>13</sup> Language is thus abstracted to a point where established linguistic usage begins to fade away. Its sound quality and grammaticality are the only clues that could potentially make it

<sup>10</sup> 'Glue my grandmother's earliest ancestors onto the inside of an enamel urn.'

<sup>11</sup> 'Unknowingly the prototypical Norman took a hugely anglomaniacal Alemanian to be his wife, amen alleluia.'

<sup>12</sup> 'In January on the Nile, painting mummies.'

<sup>13</sup> In terms of both the methods used as well as the obviously playful delight and inventiveness these linguistic games have unleashed, the generation of these sentences is reminiscent of the likewise self-imposed restrictions ('*contraintes*') seen in similar procedures associated with the literary group Oulipo (realised in its most radical form in Georges Perec's novel *La Disparition*, in which he deliberately avoided the letter 'e').

recognisable as speech, allowing it to be completely subservient to the musical composition. And just as with the semantic and functional dimensions of the speech source, the speaker and his voice are unimportant for the composition as the intonational and unique vocal characteristics are largely lost in the steps of the process, which come after the design and recoding of the text.

These individual steps in the working process are as follows: first Barlow performed a fast Fourier transform (FFT) on the recorded sentences, an analysis that maps the spectrum of the recording to the harmonics of a hypothetical fundamental (in this case 160 Hz). For the temporal resolution of the x-axis, he chose a window of 32 ms, and the frequency resolution on the y-axis was set to chromatic semitones. This visualisation of the spectrum in [Example 2](#) shows the FFT analysis of the sentence fragment 'Im Januar am Nil Mumien' and gives a quick overview of the structure of the formants (the darker areas represent frequencies that are more pronounced in the spectrum) and how they shift over time. Due to the absence of spectrally complex transients created by consonants, the division and assignment of syllables by hand is relatively easy to accomplish.

After processing the FFT data, which Barlow compiled for all the source material, the analysis part of the synthrumentation process is complete and is followed by the synthesis part, which consists of two steps. The starting point for the second step is the spiral melody, upon which the speech spectra will be projected. This process is not unlike conventional text setting, where individual syllables are assigned to notes without using any sort of predetermined system. The melody is set syllabically; of course, unlike traditional text setting, the intelligibility of the text plays no role here. After the analysed spectra have been assigned to notes, they are orchestrated for the 11–12-player ensemble (the exact ensemble used consisted of two soprano saxophones (one doubling on clarinet/bass clarinet), percussion (one or two players), piano, four violins, two cellos and contrabass). Considering the fact that the instrumental sounds used in the resynthesis need to be as close to pure sine tones as possible with few overtones in order to generate the best effect, Barlow made a general decision that the 'synthrummented' speech sounds would be orchestrated exclusively with string harmonics (as well as the occasional open strings). In order to accurately represent the spectral characteristics of the vocal formants, each string player is also assigned an individual *scordatura*, which allows the required partials to be executed as accurately as possible (the exact *scordatura* for each player with deviations of 10, 30 and 40 cents, shown in [Example 3](#), was painstakingly calculated with the help a computer program).

Now the actual instrumentation begins, in which the individual time windows of the speech spectra are transposed and projected onto the notes of the spiral melody (played by the bass clarinet at the beginning) according to the syllabic text setting and are divided among the seven strings rounding off all rhythmic changes to the nearest quaver. [Example 4](#) shows the synthrumentation of the words 'In Januar' in a two staff reduction without special indication of the *scordatura* tones. In contrast to the partially automated preliminary steps, this process, much in line with the traditional understanding of instrumentation, is wholly in the hands of the composer; nevertheless, Barlow did make use of a synthesizer to check that the resulting instrumental sounds did indeed approximate the speech spectra as intended.



Example 3: *Scordatura* of the strings in Barlow, *Im Januar am Nil*

Example 3:  
*Scordatura* of the strings in Barlow,  
*Im Januar am Nil*

### Form

The large-scale form of *Im Januar am Nil* is organised in a relatively simple and straightforward manner. Table 2 gives a structural overview.

Taken as a whole the composition is based on a ternary form (ABA), although the B section presents a sort of parenthetical interjection that breaks up the cohesive developmental logic of the A section. (The piece was originally designed as a long uninterrupted process that developed out of a single formal gesture. This original version was premiered at the Darmstädter Ferienkurse in 1982. However, Barlow subsequently withdrew this version and – clearly in an effort to break up the unidirectional procedural nature of the A section – composed the revised version from 1984 with the B section in the middle.)

### Melody

The construction of the spiral melody, which underpins the A sections with its cohesive developmental logic, as well as the main features of its spectral instrumentation in the strings, have already been presented. Another important melodic feature that has so far not been mentioned is the point where the spiral melody divides into two layers, which takes on such prominence that it is marked as the

♩. = 120

Im Ja - - - - nu - - - - ar

Example 4: Synthrumentation of the words 'In Januar'.

Table 2:  
Overview of large-scale form of *Im Januar am Nil*.

Bar	Melody Generation	Formal Divisions	Description
1	I	Aa	Spiral melody in the bass clarinet, speech spectra in the strings
5	II		
13	III		
25	IV		
41	V		
61	VI		
85	VI		
113	VIII		
145	IX		
163		Ab	Spiral melody is taken over by the piano (in 'ring modulation instrumentation'); melody in its 'basic form' switches to the bass and is from this point forward stretched to fill the length of each cycle; the speech spectra continue in the strings
181	X		
221	XI		
265	XII		
313	XIII		
365	XIV		
421	XV		
481	XVI		
545	XVII		
613	XVIII		
685	XIX		
713		Ba	'Six Quatrains': in 24 measures (ca. 40 seconds) 600 years back through the history of music
741		Bba	'Sachets de la famille'; pentatonic textures pentatonic textures + collage of quotations
776		Bbb	
791		A'	Return of the spiral melodic development; increase in density and new layers
839	XX		
919	XXI		
1003	XXII		
1091	XXIII		
1183	XXIV		

beginning of a subsection in the formal analysis above. At the beginning of the Ab section in bar 163, the spiral melody moves out of the bass clarinet and is taken over by the piano, following its developmental logic of expansion. Two homophonic accompanying voices are added to the piano melody. One voice is divided between the two saxophones, and the other pentatonic voice is allocated to the right hand of the piano. When taken together the frequencies of the two accompanying voices yield a difference tone that is equal to the frequency of the corresponding note in the main melody (the melody note and the accompanying voices are therefore in a ring modulator relationship: ring modulating the two voices produces the third).<sup>14</sup> Also at the same time as this change in instrumentation, the contrabass takes over the spiral melody, but in its basic form as quoted above – first in its original length and then progressively stretched to fit the expanding duration of the melodic cycles. The chiasmic structure of temporal layers made up of cyclic expansion and increasing density discussed above becomes more and more prominent from this point forward with the perceived tempo of the decelerating melodic layer, which is initially taken up by the rest of the strings in the spectral instrumentation, contrasted by the reverse process manifested in the accumulating density of notes in the spiral melody in the piano. The rhythmic difference between the two melodic layers logically becomes more and more pronounced. In the ninth generation, both layers are still tightly interlocked resulting in a clearly perceptible heterophony. They then begin to move further and further apart until in the last generation there are two divergent layers of completely different characters: the extremely fast, dense and atonal spiral melody in the piano and saxophones in the foreground and the slowly evolving homophonic spectral textures in the strings in the background.

### *Signals*

The percussion is characterised by the primarily signalling and semiotic role it plays throughout the piece (except for the Japanese temple bells section, A'). The most basic signal is performed by the finger cymbals, which provide a clearly audible demarcation for the beginning of each cycle of the spiral melody. In this way the listener, who would surely not be able to decode the cyclic construction of the spiral melody on a purely perceptual level, is able to experience the temporal structure of the spiral melody as a series of ever expanding sections. In addition to the finger cymbals, muted gongs can be heard from the fourth generation through to the end of section A. These mark, on the one hand, the beginning of a new twist in the spiral melody, and later on they also indicate when a string instrument leaves the beat-based speech-sound orchestration and becomes rhythmically aligned with the contrabass. Another signal that occurs only once in the whole piece is a shot from a toy pistol in the B section. In the same section towards the end (bar 746), the snare drum is introduced as a new element. It comes across as signal-like, due to its sonic qualities, and yet – and unlike the other signals described so far – it is not associated with other structural levels sonically or formally and therefore forms its own layer that is itself subject to its own

<sup>14</sup> In order to be able to approximate the heterodyne frequencies resulting from ring modulation that do not fit into the equal tempered tuning of the piano, the tuning of the two saxophones has to be adjusted: saxophone one is tuned a twelfth-tone lower and saxophone two a sixth-tone lower.

developmental process. The time between entrances first becomes progressively shorter and is then augmented by quavers in the bass drum so that, whether intentional or not, at the end the rhythm is a reference to the famous opening motive of Beethoven's Fifth Symphony. This principle of mediation between signals and processes introduced in the B section carries on into the A' section. Here it is the bass drum, gong and suspended cymbal that articulate an independent temporal layer. This layer triggers a process of acceleration, which helps to effectively create a gravitational pull towards the end of the A' section.

#### *Further procedural layers*

In addition to the fundamental processes of the spiral melody development and the somewhat non-systematic percussion layers just discussed, there are two additional layers that set large-scale processes in motion. The first of these is a layer consisting of distinctive string chords that, although they appear in different combinations of instruments, remain constant throughout the whole piece in terms of their basic structure and sound quality (each instrument plays between two and three open strings). This layer, which begins in the fourteenth cycle and continues for the rest of the piece, sets off a process of acceleration, with the time between entries becoming ever shorter. The process does not follow the same consistent, linear logic as the spiral melody's expansion and accumulation, but it does quite effectively create a similar gravitational pull. And the fact that – unlike the spiral melody, which is only present in the A sections – the string chord layer continues through the inserted B section helps to connect the large scale formal divisions that differ radically in their respective musical construction by providing a subtle element of structural coherence.

The string chord layer is quite similar in terms of its structure and musical effect to a further process that occurs in the two saxophones in the A' section. Periodically, the saxophones briefly abandon their role accompanying the spiral melody to interject shrill dyads in the high register (mostly seconds or sometimes minor thirds – additionally coloured by the microtonal tuning of the instrument). Here too the process is characterised by an acceleration that is structured in a similar manner as the string accents, although the additive effect of the process is not so much due to the acceleration of the rate of the entries as in the string layer, but rather it is more a result of the increasing density of attacks. This continues until the end, where a long sequence of closely spaced attacks – when performed accurately – establishes a clear tempo that stands in a 4:5 ratio with the tempo of the strings (the strings have 4 quavers, and the saxophones 5 quavers as the smallest unit). These two layers overlap creating a polymetric texture that can be heard as a kind of polyphony of two different tempos.

#### *Interludes*

The B section inserted approximately in the middle of the piece consists of two interludes, which present a radical contrast to the abstract procedural nature of the surrounding A and A' sections. After breaking off the A section, the first interlude titled 'Six Quatrains' establishes an utterly surprisingly musical reification by taking the listener on a tour de force journey backwards through music history ([Example 5](#) shows a separate version for string quartet).

## Six Quatrains

arranged for string quartet

Clarence Barlow  
(1984)

*sempre ritardando*  $\text{♩} = 180$   $\text{♩} = 144$   $\text{♩} = 132$  *molto espressivo*  $\text{♩} = 126$   $\text{♩} = 120$

Violin I  
Violin II  
Viola  
Violoncello

*f* *mf* *p* *f* *mf* *f*

*f* *fp* *mf* *f*

7 *tutti sempre meno forte e con meno vibrato..*  $\text{♩} = 116$   $\text{♩} = 112$   $\text{♩} = 108$

13 *..tutti mezzo forte..*  $\text{♩} = 102$   $\text{♩} = 100$  *..tutti piano e senza vibrato..*  $\text{♩} = 98$   $\text{♩} = 96$

19  $\text{♩} = 94$  *..tutti pianissimo*  $\text{♩} = 92$   $\text{♩} = 90$

Example 5:  
String quartet version of Barlow, 'Six  
Quatrains'.

According to Barlow<sup>15</sup> each bar of the music progresses back through 25 years of the history of western art music, which with six phrases of four bars each (this is also a reference to the four line strophic structure of a 'quatrain' alluded to in the title), gives a total of 600 years which are traversed (counting backwards from ca. 1980). And the trip back in time – even though it might not always be possible to date its course as exactly as it is laid out in the compositional plan – is really quite easy for the listener to follow. Although no concrete quotations are used, and all of the musical material is of Barlow's own invention, very clear stylistic elements are indeed recognisable in the pseudo-historical counterpoint exercise. The dramatic arch of the historical journey is made clear through syntactic turns and twists that segment the dense stream of information such as the authentic cadence (in bars 12 and 13 in the excerpt given) and the phrygian cadence four bars later.

The second interlude, 'Sachets de la famille', which immediately follows the 'Six Quatrains', clearly sets itself apart from the preceding interlude as well as the A section. On the one hand this has to do with the fact that, in contrast to the procedural directionality of the previous sections (the structurally motivated A section and the referential dramatic arch of the first interlude), a static character dominates in this section because of the proliferation of a pentatonic sound field. On the other hand this simple pentatonic texture presents a significant contrast to the previously dominant complex intervallic relationships. Only in the second part of the interlude does the pace of events pick up when, in an almost theatrical effect, a shot fired from a toy pistol<sup>16</sup> startles one of the clarinets, who begins playing a quotation of a completely pentatonic passage from the overture to Smetana's *The Bartered Bride*. Then the play on historical references started in the first interlude is taken even further when three famous pentatonic melodies from Russian composers (from Stravinsky's *The Rite of Spring*, Mussorgsky's *Pictures at an Exhibition* and Tchaikovsky's *Sixth Symphony*) are quoted dovetailed into one another in the clarinet part.

The dramatic function of the musical reification achieved in the interludes is immediately clear: the strict logic of the self-imposed rules and the automatic, mechanical generation of music they imply needs to be put into perspective. The relentless character of a forward-driving process is broken by a moment of playful comedy. Nevertheless, the interludes are more than a postmodern gag inserted after the fact, as evidenced by the subtle structural integration into the rest of the piece. We have already seen how the procedural layers in the A section are continued or in some cases anticipated in the interludes. Moreover, a structural connection is established in the pentatonic pitch content that dominates the second interlude and was already latently present in the A section, namely as a part of the 'ring modulation instrumentation' of the spiral melody in the right hand of the piano. As a formal consequence of the B section, this returns once more in an even clearer form in the A' section when the right hand of the piano is replaced with the pentatonic Japanese temple blocks.

<sup>15</sup> In an unpublished transcript of a lecture held at Johannes Gutenberg University, Mainz, on 6 February 1998.

<sup>16</sup> This event relates to the title of the interlude (English: 'The family bags'), which according to Barlow is a veiled reference to a not very well-liked colleague who was always carrying plastic bags around with him. At this point in the piece he is symbolically shot dead.

### Speech as conceptual model

The analysis has shown how the realisation of the synthstrumentation process in *Im Januar am Nil* serves to 'clothe' a purely musically conceived melody with a characteristic speech sound and thus forms only one aspect among many in the overall structural context of the composition. The acoustic recognisability, not to mention the ability to decode the phonetic features of the underlying speech material, which is certainly implicit in the concept of synthstrumentation as a musical approximation of speech, no longer plays any role in the compositional result. This is a crucial difference between Barlow's composition and other comparable approaches, seen in pieces based on instrumental speech synthesis where the speech source is recognisable as a concrete reproduction audible on the surface level. Peter Ablinger's pieces *Quadraturen III* for player piano, mentioned at the beginning of this article, function like a reversible image. They can be heard as either complex abstract music or as a 'phonorealistic' reproduction of concrete speech material. The pieces thematise the mode of perception of the human auditory system at times in a striking way (just providing some additional text material is enough to tip the scales so that the listener is suddenly able to hear a dense cluster of notes as an unambiguous linguistic utterance). Barlow's work is different. Not only for *Im Januar am Nil*, but for his works in general, the process of synthstrumentation is never employed in its pure form as a means of reproducing speech; rather, it is only just one aspect of an explicitly musical context, and speech always remains a conceptual model never becoming an unambiguous perceptual reproduction. This is also the case when the reproduction of speech is much more clearly resynthesized than in the present piece. In one passage in Barlow's orchestra piece *Orchideæ Ordinariæ*, the words 'Why me? No money. My way' appear, synthstrumentized in high resolution with strings divided into 27 parts plus piano allowing the words to emerge in an almost intelligible form. However, this passage is just a short moment in a larger work, and the addition of a pulsating figure in the percussion which is completely unrelated to the speech material serves to establish an explicitly musical layer. In another piece that uses his synthstrumentation technique, *Felle Hymnus van Verre*, listeners who are not familiar with the conceptual background of the piece would never guess they were actually listening to the Dutch national anthem. Instead they hear a fanfare-like music that is clearly spectral in character but otherwise abstract with air sounds and noises interjected into the mix. Only when the piece is heard in a version 16 times faster does it become clear that the original is an extremely slowed down version of the national anthem in which the sung text has been synthstrumentized. It is not just the melody that is reproduced but also the spectral sound structure of the sung voice. This is the origin of the instrumental noises, which in the spectral texture of the original seem to be foreign bodies but integrate seamlessly into the vocal textures of the accelerated version. Of course, as it is hardly possible for the audience in a concert to flip back and forth between the abstract and the concrete mode of auditory perception, decoding the abstract acoustical structures as a concrete musical representation remains a sort of conceptual surplus. In this as in other examples it appears therefore as if Barlow consciously avoids applying the conceptually pure form of his synthstrumentation process in his compositions. This could be seen as indicative of a fundamental scepticism towards the obvious imitation of the extramusical reality (a position that is not

uncommon in the history of music) and to the same degree as an aversion to a type of conceptual thinking that places a higher value on the underlying idea than on the actual sound result. Barlow's goal in all his works – as the labour-intensive compositional process of *Im Januar am Nil* shows – is to integrate the compositional techniques into a structurally coherent, musically conceived whole. Ironically, in the case of *Im Januar am Nil*, the parts of the composition based on the synthrumentation of speech – the A sections – seem to be utterly unspeech-like, due to their strict procedural nature, while on the other hand the sections that are in no way derived from a speech source – the two interludes of the B section – do at least evoke a speech-like mode of hearing as they clearly bring a semantic dimension into play through stylistic allusions and quotations. It is not the conceptual potential implicit in the synthrumentation process that is the main focus; rather, it is the musical composition and – in the case of *Im Januar am Nil* especially – the dramatic structure of the piece, which fundamentally determine the ultimate effect of the sound result. Indeed the procedural generation mechanism of the spiral melody in the A sections lends it a sort of unrelenting mechanical quality, which is briefly interrupted by a burlesque and comical B section, only to be drawn back into the ever intensifying teleological pull, which the listener is hardly able to resist.

In summary it can be said that the overall effect of the piece is not reducible to the individual components of its generation; rather, it emerges from the interaction of these elements. And this is exactly what I believe to be not only the real strength of *Im Januar am Nil* but also the source of the exemplary quality of Barlow's compositional imagination in general. Technical processes and conceptual ideas just like individual musical ideas and passages are not sufficient to be an end in itself. On the contrary it is the way that all these elements interact with and are connected to one another that creates a musical result which – transcending stylistic conventions – is in the position to cultivate its own physiognomy, while at the same time remaining ever versatile and – as *Im Januar am Nil* still shows 30 years later – surprisingly original and new.