Composer's Note

Music for Tárogató, Computer and Visuals: *Burren Wind*

Mara Helmuth
University of Cincinnati

Esther Lamneck
Performing Artist, New York

Abstract

This paper will present an overview of a series of collaborative compositions between Mara Helmuth and Esther Lamneck, and discuss the most recent work, *Burren Wind*, in more detail. Lamneck describes her research with the Hungarian Tárogató and compositional work as well as the collaboration with Alfonso Belfiore, who created the interactive video part for *Burren Wind*. Helmuth provides a summary of the collaborative projects and the computer music components of the works, including granular synthesis techniques.

1. Introduction

Mara Helmuth and Esther Lamneck have created a series of collaborations for instrument and computer, including Irresistible Flux (Tárogató and eight-channel live electronics, 2014), Breath of Water (clarinet and stereo audio, 2016), Sound Dunes (Tárogató and eight-channel audio, 2022), and Burren Wind (Tárogató, computer music and live video, 2023). The virtuosic and innovative performances of Esther were an inspiration in creating the computer music worlds in all of these pieces.

To understand the sound worlds used, a brief history of the Tárogató instrument is presented. A visit to the rocky landscape of the Burren on the coast of Ireland, following the 2022 International Computer Music Conference in Limerick, Ireland, inspired Helmuth, Lamneck and Alfonso Belfiore to create *Burren Wind.* Tárogató multiphonics, new granular synthesis tools and images of natural landscapes are components of the audiovisual composition.

2. Computer music composition and collaboration

In all of the collaborations, the instrumental sound was a generating idea for the computer music, and recorded samples were used to create much of the material for the pieces. Helmuth's granular synthesis techniques were used for processing many of the sounds, in the RTcmix music programming language and MaxMSP. Granular synthesis here involved creating complex sounds from tiny bits or grains of sound, using probability distributions to shape gestures and changing textures. Visual ideas often played a part in the composing process, from the rising and falling dune-like gestures of Sound Dunes, to landscape images from the Burren in Burren Wind, to abstract mental images Helmuth associates with particular timbres in her work. Esther would respond to material created, with new material, in an interactive back-and-forth exchange and mixes went through many iterations before being finalized. Esther's ability to respond on her instrument to almost any digitally created sound was astonishing and lead to explorations of timbral, textural and rhythmic constructions in each work.

3. Previous works

Irresistible Flux was based on an old folk song, which begins the piece in the Tárogató part. Processing of the folk song becomes more extreme throughout the piece, with many layers of granular sampling techniques creating polyrhythms and dense textures with the Tárogató. While a few of the computer music sounds were fixed, they were triggered in real time along with many processes unfolding live. This hybrid approach allowed for maximum complexity and diversity of sounds, while keeping a spontaneous aspect of the live performance. The short sound check times, however, required for many venues encouraged moving to fixed media electronics for subsequent compositions. *Breath of Water* was for clarinet and stereo audio. The work was based on subharmonic sounds and other gestures performed on the clarinet, and digital signal processing transformations to zoom into tiny bits of sound, to prolong various resonances within the sound, and finding ways to merge different types of sound. It was influenced by the sight and sounds of humpback whales experienced on Helmuth's windy boat ride from The Great Barrier Reef's Opal Reef to Port Douglas, Queensland, in July, 2016.

Sound Dunes marked a return to Tárogató for the duo, with the computer part in two- or eight-channel versions. The piece had resonances with the natural environment of a sand dune, with its curving contours and granular texture. An immersive forty-channel version was presented at the Sonic Arts Research Centre Sonic Laboratory for the 2022 Sonorities Festival.

4. The Tárogató, E. Lamneck

The Hungarian Tárogató has a unique and hauntingly beautiful sound. Although many centuries ago tarogato referred to a double reed instrument which originated in the Middle East and was at times called an Eastern oboe or a Turkish pipe, the current form of the Tárogató was built in the latter part of the nineteenth century in Budapest. Gustav Mahler required the Tárogató for the performances at Vienna and Budapest of the Shepherd Boy's tune in the third act of Wagner's Tristan and Isolde.

The Tárogató is a single reed woodwind instrument with a conical bore, (the shape of today's soprano saxophone) rather than the cylindrical bore of the clarinet family. The Hungarian Tárogató, which I play is an original Stowasser, which was manufactured in Budapest over one hundred years ago. Figure 1 shows Esther Lamneck's Tárogató.

Figure 1. The Tárogató.

It is an unusual woodwind instrument in that it does not have an extensive role in western classical music. It is originally a folk instrument from the regions of Hungary and Romania. It uses fingerings which are similar to the oboe's and has a scale which is non-tempered. Since it was primarily a rustic instrument and taken up by folk or village musicians whose music is handed down aurally, there are few known works specifically written for the instrument from its past.

Sándor Burka, one of the Hungarian masters of the Tárogató, left us with a few tapes and recordings of his interpretations of Hungarian folk songs. My study of the folk music of Hungary and Eastern Europe, has provided me with a rich source of material for the instrument. While my style of improvisation has also been influenced by the great improvisers of our day, in jazz and new music, my sound and performance of the Tárogató remains reminiscent of its heritage.

Much of the new music for the Tárogató has been composed for me because of the freedom of the instrument and because of the magnificent sound of the Tárogató. The instrument's aural tradition has led me to perform it in new music improvisation and electronic sound environments which provide me with the freedom to explore the instrument's sonic potential. The Tárogató provides a rich sound, full of harmonics. This has allowed me to broaden the range of the instrument including another octave of high harmonic material above its standard range. Because of the key structure it is possible to explore glissandi throughout much of the body of the instrument. This provides the possibility of "new techniques" which are not possible to such an extent on the clarinet nor other woodwind instruments with extensive key mechanisms.

I have had the privilege of working with numerous composers throughout my career. I look forward to each new proposal as a joint adventure in sonic exploration towards the creation of new works for the Tárogató.

5. *Burren Wind*

5.1. *Burren Wind* computer part

Kieran McAuliffe and Helmuth created new versions of the StochGran software in 2023 (McAuliffe 2023). The RTcmix instrument STGRAN2() was used for the granular sampling processing in *Burren Wind*, which was an easier to use and more flexible tool for timbral control than its predecessors. In the computer parts in the first and last section granular synthesis materials were prominent, and allowed an intricate rhythmic interaction with Esther's live performance. In the middle or second section, spectral delay techniques and reverberation, also done in RTcmix, were used to extend sound into sometimes sparkling, sometimes richly dense environments to compliment the Tárogató multiphonic spectra.

5.2. The *Burren Wind* Tárogató collaboration, E. Lamneck

The second section of *Burren Wind* was designed around the use of low register Tárogató multi phonics. During the pandemic I was able to explore in depth, the harmonics of the Tárogató in all of its registers. I have always used the upper register harmonics, finding them by under blowing the high register fundamentals. I am able to isolate the high harmonics from the harmonic spectrum and

sonify them by hearing the harmonics, altering my breath flow and the intensity of expelling the air. The low register fundamentals are the most solid and have the richest sound on the instrument. It is full of harmonics which are pronounced in the upper registers using traditional fingerings. In order to produce multiphonics in the low register it was a matter of researching all of the possible alternate fingerings and an exploration of finger juxtaposition. The resulting low register multiphonics also produce an incredibly rich harmonic sound.

While Mara and I were performing at SARC in the spring of 2022, I was able to record many of the low register multiphonics for her which she later processed and incorporated them in the middle section of *Burren Wind*. We were impressed by The Burren which we visited during our ICMC stay in Limerick, Ireland and moved forward to create a work based on these influences. Having worked collaboratively with Mara for many years, I have always been struck by our shared use of energy.

In developing the Tárogató material for other sections of *Burren Wind*, I wanted to create material that was pulsing with energy. Working with staccato provides me with many options to generate energy and to propel the notes of a phrase. The speed of the staccato is important along with the amount of space that can be inserted between notes without dissipating energy. I work with the breath column and its intensity and pressure behind the staccato so the bounce of the sound produces energy. The register choices in staccato are perceived in different ways and maintaining a specific speed in order to maintain the sense of propulsion is vital. Dynamics also play a role in our perception of speed and energy. Since this is a collaborative work, I wanted to create phrases that could be exchanged with the electronic phrases and at the same time maintain energy throughout the spaces.

6. Multimedia collaboration, E. Lamneck

The video component of *Burren Wind*, which was designed by my longtime colleague, Alfonso Belfiore, is both interactive realtime and fixed video. It is always intriguing for me to generate sound or video, and react to it at the same time while I conceive of the overall composition at any point in time during the creation of the work. In this specific video I am sometimes able to produce the appearance of specific images or have them remain for longer than a glimpse of time, by the repetition of the same pitches or sustaining long notes and working with the intensity of the breath. The emphasis of my attacks and the frenzy of high velocity phases fracture the visuals, generating the same sense of energy that Mara and I have created in the sonic world of *Burren Wind*.

Figure 2. The Burren.

Figure 3. The Cliffs of Moher.

7. Video composition

Figures 2 and 3 show the natural landscape at the Burren and the Cliffs of Moher. Alfonso Belfiore writes about creating the interactive video part: ”The visual contribution of Burren Wind develops an elaboration of a flow of images collected from the original photographic and video materials produced during the trip to Ireland in July 2022 for participation in the ICMC held in Limerick. Photos and videos that testify and tell the magic of a place whose history is lost in the past millennia. Traces that emerge from memory, signs and symbols, still strong, left by ancient events that, intertwining human destinies and natural phenomena, appear again, constantly reflected in the interactive counterpoint with the music. The live visual is performed in real time and interacts with the music using digital technologies and software specifically created with MaxMSP and Jitter. A fixed video flow constitutes the basis on which the elaborate images appear, recalled and controlled by the sounds of the Tárogató, in an increasingly dizzying choreography of fragments and colors. The work can be performed live even with pre-established interaction.”

8. Conclusion

Burren Wind extended the Helmuth/Lamneck collaboration into a multimedia realm with composer Alfonso Belfiore, working in multimedia, who was similarly inspired by the natural landscape. The interactive video part responds to the performer's playing. Figure 4 shows the video at 0:54 seconds, when the Tárogató is playing, and the natural image is processed. In Figure 5, the image is closer to the actual Burren landscape, since the Tárogató has stopped playing, and the processing of the image has lessened, revealing the stone structure. Some of the video processing resulted in specks of color distorting a natural image, which could be perceived as a process analogous to granular sampling in the audio realm.

Figure 4. Burren Wind at 0:54: Image processing occurs while Tárogató plays.

Figure 5. Burren Wind at 0:56: Landscape returns when Tárogató not playing.

Video processing of natural images added an exciting element to the composition, and brought the listener closer to the experience of the sonic environment and the Burren.

References

McAuliffe, Kieran and M. Helmuth. 2023. "The New StochGran: Stochastic Granular Synthesis in RTcmix" in *the Proceedings of The International Computer Music Conference 2023*, International Computer Music Assoc. Shenzhen, China.

9. Author's Profile

Mara HELMUTH

Mara Helmuth has been enthusiastically involved with electronic and computer music composition and research for decades. Recent works include *Burren Wind, Sound Dunes, Opening Spaces* (video), *Onsen: Hot Springs*, for vibraphone and fixed media,and *Water Birds*, for clarinet and live electronics. Her music has been performed internationally at conferences, festivals and arts spaces, exhibited as installations, and is on recordings from PARMA, INNOVA, Fundamental Sounds, Centaur (CDCM), Open Space, Electronic Music Foundation and Everglade. She has collaborated with performers including Esther Lamneck, Joseph Van Hassel and Andrea Vos-Rochefort. Her research has involved granular synthesis, wireless sensor networks and music, Internet2 improvisation and performance, analysis of electroacoustic music and the RTcmix music programming language. She is currently Professor of Composition at College-Conservatory of Music, University of Cincinnati and director of its Center for Computer Music. She received the George J. Rieveschl Award for Scholarly and/or Creative Works at UC in 2023. She was on the International Computer Music Association board of directors for a decade and served as its President. She holds a D.M.A. from Columbia University and earlier degrees from the University of Illinois at Urbana-Champaign.

Esther LAMNECK, Clarinet and Tárogató

The New York Times calls Esther Lamneck, "an astonishing virtuoso". She has appeared as a soloist with major orchestras, with conductors such as Pierre Boulez, with renowned chamber music artists and an international roster of musicians from the new music improvisation scene. A versatile performer and an advocate of contemporary music, she is known for her work with electronic media including interactive arts, movement, dance and improvisation. Dr. Lamneck served for more than three decades, as full professor and artistic director of the NYUNME at NYU, Steinhardt. She makes frequent solo appearances on clarinet and the tárogató at music festivals worldwide. Many of her solo and Duo CDs feature improvisation and electronic music and include "Cigar Smoke"; " Tárogató "; "Winds Of The Heart"; "Genoa Sound Cards"; "Stato Liquido"; "Trasfigurzioni"; "Sky Rings"; "Small Parts of a Garden" , etc. Computer Music Journal calls her "The consummate improvisor." New York Music Daily, "Surrealistically Captivating.."; "Esther Lamneck has fascinating chops and ideas" jazzweekly.com; "È eccezionale la microtonale ricchezza di suono del tárogató" ["the microtonal richness of the sound of the tárogató is exceptional']

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