

WHEN HUMAN EMOTION MEETS TECHNOLOGY. A STUDY OF MACHOVER'S *DEATH AND THE POWERS, THE ROBOT OPERA*

Mihaela BUHAICIUC¹

Abstract: *A vast palette of artistic experiences remains purposely unexplored today by many performers of traditionally oriented opera companies. Ignorance is often the cause of statements such as: absence of melody, of emotions and difficulty in communicating with the audience in the new operatic repertoire. My study offers an assessment: that melody can be identified in the most unusual musical architecture of today's composed opera; and that emotional delivery and communication in the singing art occur still through text, audio-visual, and now, as never before, through technology. In order to demonstrate this I have chosen one single opera, perhaps the newest, but certainly the most innovating of the 21st century, a masterpiece, that has been in the spotlight since its premiere in 2010 and whose music, libretto and performing production may seem controversial to some of the traditional-oriented performers and audiences. It is Tod Machover's *Death and the Powers, the Robot opera*. The article also highlights the importance of sustaining innovation in the opera as a need to naturally adapt to the new conduct of life.*

Key words: *opera, human emotion, Tod Machover, technology, *Death and the Powers*.*

1. Introduction

The human being is designed to inherit mentally and emotionally the environment that is exposed to. In this context, the repertoire frequently performed shapes specific artistic behaviors and audience demands. Thus, it is comfortable to comprehend and connect among each other – as performers or audiences - when a musical tradition has been already genetically innate. This explains why

certain opera stages chose to remain very traditional and, in some aspects, too old.

Nonetheless, it also lays in the human being's design, - as a need to survival - to seek, internally and externally, for more data to be added to the inherited-existing one. For a performer or any artist, searching for the new should be just as indispensable as preserving the old. As a consequence, new forms of expression take place, and the human's creative nature continues to survive.

¹ Faculty of Music, *Transilvania* University of Braşov.

Deprived from awareness and in some cases, embraced by ignorance, many refuse to accept that a new artistic behavior is shaped and new manners of expression and communication are already explored – all from the need to align to the present.

Technology comes out to stand as a strong reality of our lives. It is used daily and represents almost a prerequisite for sustaining human connections and relationships. Technology is a technique that can be perfected to favor the human existence without altering the essence of the human soul. We are living the time when, the new artistic demeanor, which upholds human emotions, meets technology, which upkeeps human innovation. There is no other live-performing work that has portrayed and encompassed on the same platform today's human mind, heart, voice, dreams and technology as Tod Machover's opera *Death and the Powers*.

2. A science-fiction story: *Death and the Powers*

Commissioned by *Futurum* Association of Monaco, developed and produced by the Massachusetts Institute of Technology (M.I.T.)'s Media Lab as a project of the Opera of the Future Group, *Death and the Powers* [1] is a ninety-minute one-act opera on Tod Machover's music and Robert Pinsky's libretto. There are four main characters, whose drama is told in retrospective by a chorus of robots designed to sing, move and react.

Serving as a Greek chorus [2] a cluster of nine robots appears in the Prologue. Programmed by the 'Human Creator', the machines ask questions such as: what is death; what is suffering; what means to feel and be alive. Four of these robots identify in voice with the four main human characters, which will appear on stage,

when the robots finish downloading the data from their memory.

The human drama unfolds throughout eight scenes. The action develops in the house of the inventor, Simon Powers - the place where he works with his research assistant, Nicholas, and where his family resides: his third wife, Evvy and his daughter, Miranda.

Simon, who became in time very rich, built in his house computerized, moving walls, an enormous musical chandelier, robots - all shaping an artificial intelligent environment that he calls "the System". Being ill and obsessed with the idea of living forever, Simon invents the formula that allows him to download his mental and emotional data into the System. He believes that by doing so he will continue to live through the System. Helped by Nicholas, he accomplishes his dream leaving behind the mortal matter and of course, his family. After Simon's transformation, the objects in the house start moving, talking and reacting to the humans left in it. Now Simon is "the software of the System" as he states in Scene 6. He controls the computer-based objects of the house: he reconnects with Evvy through the Chandelier; he communicates with people's delegation through the three giant bookshelves, claiming to have no self anymore, and therefore he is not selfish; he enjoys his non-physical habitat reciting German poetry; and at last, he calls for his daughter to enter the System.

Nicholas, the assistant who becomes Simon's follower has a story of itself. Once saved from misery and pain by Simon, Nicholas became partially inorganic. Some of his body parts were artificially replaced in the past with components programmed to work for him. His physical structure is the proof that the human emotional and mental data can reside in both mortal body and human-built

apparatuses. Nicholas is the most convinced that consciousness could live on beyond the mortal matter and that the transition from organic to 'post organic' is the key for a new painless life. "We can save the world," he affirms. Simon is already "an Intelligence in the System and I am his creation". This process of data mutation is "like falling in love." [3] Nicholas choses to merge with the System, along with Evvy, once people's delegation has left Simon's house.

Living under the same roof and enjoying a life of luxury, Evvy Powers, Simon's current wife accepts too easily the decision that her husband takes, to transcend beyond matter. She is portrayed as a sensual and obeying woman, in search now for her loving moments with Simon. Although she questions his choice, Evvy decides to listen and follow.

The most human character of the entire opera is the one who continuously questions and fears the System: Simon's daughter, Miranda. Being her only blood-connected relative, Miranda remains tormented by her father's choice. She cannot decide whether the System is the solution or not, for saving the humanity. Her concerns are real: can love be possible out of the body, can she still help the world from the inside of the System, can she detach from the world and its miseries when humans are linked to each other through vibrations, how can she remain indifferent to the world left behind. The spectator is left with the impression that, until the end, Miranda does not find peace with the thought of entering the System, but, at her father's calling, she finally goes.

Pinsky and Weiner do not exclude from their story the traditional collective personage: *vox populis* represented by the three delegates and by the Miseries. Antagonist to the Powers, *vox populis* demands human help and support. Refused by Simon, the audience is driven to think

that, the collective character either died and/or entered later the System. Humanity has vanished. The nine robots appear on stage in the Epilogue. The four voices of the main characters are heard again through four of the machines moving on stage. The audience is left to answer itself those questions that wondered humanity since its birth.

Although of science-fiction nature, Pinsky's libretto [3] addresses in many aspects the human's concerns of today and anticipates the possible choices of tomorrow. Since antiquity humans wondered and searched for the Light – as Simon names it - the world of no pain and no suffering, as they are aware of its existence. But this awareness comes from a data memory, which resides in the human, and reaffirms that in fact we have been to the Light before human birth and we will return to it, after the human death. Simon fears the physical death. His technological dream represents - in a different era - the ultimate spiritual dream. But is he right? Could one accomplish emotional and mental growth once freed from the human condition?

Intermingled with super-futuristic concepts, the story has a profound philosophical and spiritual content. Identifying or not with either of the characters, the spectator is left to reflect on his own answers.



Fig. 1. *Miranda (Sara Heaton) and Nicholas (Hal Cazalet) listen for Simon, 2010, Monte Carlo performance, – photo by Paula Aguilera [4]*

3. Human emotions within a modern musical design

The human emotion occurs first on the heart's vibrational level and then, becomes objectified in the human mind [5]. Accordingly, the vibrational movement of the heart transpires into thought. The thought becomes a concrete representation of the soul motion, which we normally call *e-motion*. In the realm of musical consciousness, the objectified emotion, the thought, converts into a tune. This heart-mind behavior is a human blueprint, and it is hereditary.

In the past, the tune or the melody was of very simple structure. As human interactions and the environment expanded, the pallet of emotions increased and therefore the possible mental representations. Their musical correspondents, in the opera context, show today the human evolvement: from Handel, Mozart, Rossini, Verdi, Puccini, Wagner, Britten, Glass, Saariaho and, we get where we are now, to Machover.

However, occasionally, we can identify mental representations designed to align to the surroundings, which have no heart root. They do not harmonize internally and they are only mentally configured. These musical art works will temporary please or challenge the mind, but will never undertake profound changes in the context they are created, or impact lives. This is not the case for *Death and the Powers*.

The music of *Death and the Powers* is the combined result of a strong inner emotion with a multi-layered mental representation. Machover brings together the inherited musical data – the traditional – with the electronic-experimental datum, shaping this way a hybrid musical language through which, he communicates.

3.1. Fusion of tradition and innovation

Reflecting the natural order of things, a first indicative that captures attention is the choice for voices: the couple Simon-Evvy, baritone-mezzosoprano and the youngsters: Miranda and Nicholas, soprano-tenor. This musical component maintains timbral unity and balance.

In musical form, *Death and the Powers* is a succession of connecting scenes, which coherently support and develop the plot. The orchestra unit is formed of fifteen instruments precisely arranged in the pit: flute/piccolo, oboe/English horn, clarinet/bass clarinet, French horn, trumpet, trombone, tuba, percussion, keyboard 1 (with live electronics), keyboard 2 (with electronic triggers for sound and image), violin I, violin, II, cello, and bass [9]. In addition to these, we hear in Scenes 3 and 4 a robotic multi-stringed instrument, played on stage by plugging or dampening, the Chandelier.

The harmonies are complex, at times tonal. Breaking any conventional practice, Machover reveals a distinct personal style. Although the melody is not the guiding factor, is clearly there and it is harmonically sustained by instrumental layers and occasionally by electronic effects. The remarkable feature of Machover's music is the way the text, harmonies and melodic lines hold and convey the emotion.

The love scene, that any opera comprises, is exceptionally depicted here. Constructed in two sections, the Simon-Evvy duet (Scene 3) and Evvy's aria, *Touch me*, (Scene 4), have one character on stage and the other off-stage. Although Simon is personified in a computerized object, the duet is intense musically and dramatically.

Harmoniously balanced throughout the opera, individual musical parts are distributed to each of the characters:

Miranda's *I miss having a father*, Nicholas' *Still I wonder*, Simon's *I am a producer*, Evvy's *I will tell you*, just to mention a few. But not at last and nor the least, the Delegation's trio moments add a significant contribution to the melodic material. A people's drama, the music here – direct, and patterned rhythmically - echoes the torments of the outside world. The voices' *Fach* is not randomly picked: a *basso profundo* and a lyrical baritone at the opposite of a sharp countertenor timbre. Their musical language stands as an example of psychological insight and musical style in which, Machover is distinctive.

For the Operabots, Machover chooses to combine unaccompanied declamatory speech with lyrical lines sung on electronically produced sound. The structure of the melodic phrase is irregular but interconnected with the overall.

It is to be noted here Machover's personal statement on his music: "The musical language is as varied as in anything I have done, covering a range of expression from quizzical, comical robots, to heartfelt human conflict, to spiritual speculation, to technological transcendence. I have attempted to define these contrasting worlds through a mixture of acoustic and electronic sounds (musical, natural and sometimes un-natural), of jagged rhythms and soaring lyricism, and of spicy harmonies and enveloping textures, all flowing together and moving forward through eight uninterrupted Scenes, bookended by contrasting Prologue and Epilogue"[6]. The outcome is a style incapable of imitation, not heavily dramatic, but one, which attains perfect balance and benefits vocal expression.

The harmonies are complex, at times tonal. Breaking any conventional practice, Machover reveals a distinct personal style. Although the melody is not the guiding

factor, is clearly there and it is harmonically sustained by instrumental layers and occasionally by electronic effects. The remarkable feature of Machover's music is the way the text, harmonies and melodic lines hold and convey the emotion.

The love scene, that any opera comprises, is exceptionally depicted here. Constructed in two sections, the Simon-Evvy duet (Scene 3) and Evvy's aria, *Touch me*, (Scene 4), have one character on stage and the other off-stage. Although Simon is personified in a computerized object, the duet is intense musically and dramatically.

Harmoniously balanced throughout the opera, individual musical parts are distributed to each of the characters: Miranda's *I miss having a father*, Nicholas' *Still I wonder*, Simon's *I am a producer*, Evvy's *I will tell you*, just to mention a few. But not at last and nor the least, the Delegation's trio moments add a significant contribution to the melodic material. A people's drama, the music here – direct, and patterned rhythmically - echoes the torments of the outside world. The voices' *Fach* is not randomly picked: a *basso profundo* and a lyrical baritone at the opposite of a sharp countertenor timbre. Their musical language stands as an example of psychological insight and musical style in which, Machover is distinctive.

For the Operabots, Machover chooses to combine unaccompanied declamatory speech with lyrical lines sung on electronically produced sound. The structure of the melodic phrase is irregular but interconnected with the overall.

It is to be noted here Machover's personal statement on his music: "The musical language is as varied as in anything I have done, covering a range of expression from quizzical, comical robots, to heartfelt human conflict, to spiritual

speculation, to technological transcendence. I have attempted to define these contrasting worlds through a mixture of acoustic and electronic sounds (musical, natural and sometimes un-natural), of jagged rhythms and soaring lyricism, and of spicy harmonies and enveloping textures, all flowing together and moving forward through eight uninterrupted Scenes, bookended by contrasting Prologue and Epilogue”[6]. The outcome is a style incapable of imitation, not heavily dramatic, but one, which attains perfect balance and benefits vocal expression.

4. Live equilibrium: music, theater and technology

Throughout the history, opera has changed in its configuration and modes of deliverance. The architecture of the audible-visual platform transmuted from the old “singer’s operas” [7] of *belcanto*, classics or romantics to the works of Grand tradition operas of Puccini or to complex music dramas of Wagner. Operas of the recent past explored new textual and musical languages or embraced non-Western traditions. New blueprints were captured later such as Britten’s, Messiaen’s, Bernstein’s, Glass’s or Saariaho’s. Machover’s *Death and the Powers*, not only comes next in the chain of contributions, but also lays the foundation of a new opera age and highlights a new concept: *digital opera*.

With the intention of creating a theatrical live performance following “the pacing of a movie” [6], the *Opera of the Future Group* from M.I.T. Media Lab, added to the *multimedia opera*’s characteristics, which incorporate “surround-sound technology, planetary data sonification, and precise synchronization between audio-video streams” [2], a complete set of innovative elements: “a distributed control

system, an off-stage performance translated into an expressive onstage presence, and a chorus of robotic characters”[2]. Consequently, a large number of technology and digital artists complement the technical crew in order to manage and synchronize: 40 computers, 143 speakers and the ambisonic environment, all on 7 running softwares: Digital Performer 7.24/8, MOTU ProVerb, MaxMSP 5, Kontakt 3.5, 3D Audio Scene, Custom Audio Units, Duran WinControls and Studer Vista Remote [8]. There is a light sound amplification in the orchestra and for the singers’ voices, the latest using “Sennheiser MKE 1 microphones hidden in the wigs, according to the standard Broadway practice”[8].

Credited for their contribution to the making of *Death and the Powers* the following crew personnel are to be named among many others: Peter Torpey - visual design and software; Elena Jessop - interaction design; Ben Bloomberg - sound technologies; Michael Miller - robotic systems; Bob Hsiung - technical development manager; Alex McDowell - set design; Diane Paulus – stage director and Simone Ovsey – opera’s producer.

4.1. Technology for vocal expression

An essential milestone in the history of opera is the development of a new Machover technique used to personify and amplify live human expression on stage with the use of technology while the performer is off-stage - a procedure defined by its author as the Disembodied Performance. The singer’s breath, voice and gesture are captured using body sensors, which convert the information and distribute it through the software to the triggered computerized objects, which manifest in real time on stage through movement, lighting and/or sound. Disembodied performance represents a

real-time voice transformation and interactive-body monitoring systems of the back-stage singer. Peter Torpey examines substantially in his theses [11] this technique, explaining its efficiency in the discussed opera and ultimately its prospective practices in any live theatrical performance.

There are three robotic components in the *Death and the Powers*, which are used to embody Simon's expression: the three-periaktoi wall set, the Chandelier and the robots. When coming alive on stage, this interactive set creates a sense of visual symmetry. The occurrence of color patterns becomes symbolic.

Human emotion has been often associated with color. Through the disembodied performance, the audience acquires an abstract representation of the human emotion, both visually and audible. While Simon is communicating to the outside, the System is often red, blue or white, with few other color variations. In a research completed in 2005 through the Sensitive Artificial Listener project [12] it is showed that each color, except white, corresponds to two opposite traits: positive and negative. The spectrum of Simon's perceptions is varied from: love (red), calm (blue), frustration (red), confusion (blue) to no emotion (white). The staged operabots' movement of the Epilogue symbolizes Simon's final state in the System - as 'white' is considered caring only the positive trait - in this case, the Light - and has no emotion associated with it.

Machover states in an interview with Robbie Hudson [13] from 2010: "the technology we've developed for this opera is about transmitting human gesture through time and space, which has obvious implications for live entertainment". More than just a technical implementation, the disembodied performance technique, in particular and technology, in general become in *Death and the Powers*, a

complex and inspiring component, which brings growth theatrically and musically.



Fig. 2. *Some of the operabots chorus members, in front of one of the three periaktoi wall set, 2011, Boston performance* – photo by Jonathan Williams [4].



Fig. 4. *Evvy (Patricia Risley) in sensual communication with Simon embodied in the Musical Chandelier, 2011, Boston performance* – photo by Jill Steinberg [4].

5. Conclusions

There is no ingenuity in the business of the opera if we stop at the same manners of singing, staging and communicating. This is not to disfavor the traditions of the past, but to continue the chain of unveiling human emotions and enable communication. Through the discussed work, technology has proved to amplify communication and human emotion in

opera thus, enhancing the on-stage live and the live-experience of the audience. Heavily mingled with technical components, the production remains a human experience. The theatrical configuration complements the musical design.

Death and the Powers proves that the postmodernism in opera is worth of studying and performing, and that technology does not damage the community of human feeling.

The realism of Machover and his team justifies the success of the opera. *Death and the Powers* enjoyed already several productions in three cities and prepares for a unique experience in February of 2014, when Dallas Opera Company will simulcast globally the production.

Uniting two opposite streams: human emotion and technology, *Death and the Powers* holds the stage of the third millennium's digital opera.

Acknowledgements

I am thankful to Simone Ovsey, the producer of Machover's *Death and the Powers*, who has provided the material needed for my study.

References

1. *Death and the Powers* website. Available on: <http://powers.media.mit.edu>. Accessed: 22-10-2013
2. Jessop, E., Torpey, P., Bloomberg, B.: *Music and Technology in Death and the Powers*. In: Proceedings of NIME, 2011. Available on: http://web.media.mit.edu/~patorpey/publications/technology_technology_death_and_the_powers.pdf
3. *Death and the Powers Libretto*, made available by Simone Ovsey.
4. Ovsey, published with permission.
5. Buhaiciuc, M.: *The Art of Singing. The Science of Emotions*. Trafford Publishing, U.S.A., 2013, pp. 13-37.
6. Machover, T.: <http://opera.media.mit.edu/projects/deathandthepowers/production.php>. Accessed 24-10-2013.
7. Grout, D.J., Williams, H.W.: *A Short History of Opera*, 3rd Edition. New York. Columbia University Press, 1988, pp.7.
8. *Death and the Powers, Technical Rider* provided by Simone Ovsey.
9. *Futurum Association* website, www.associationfuturum.com. Accessed at: 29.10.2013
10. Torpey, P.: *Digital systems for live multimodal performance in Death and the Powers*. In: International Journal of Performance Arts and Digital Media, Vol.8, No. 1, 2012. Available on: http://web.media.mit.edu/~patorpey/publications/torpey_padm_8.1_2012_digital_systems_for_live_multimodal_performance.pdf. Accessed at: 15-10-2013.
11. Torpey, P.: *Disembodied Performance, Massachusetts Institute of Technology*, 2009 <http://web.media.mit.edu>. Last accessed: 25-10-2013.
12. Nijdam, N.: *Mapping Emotion to Color*, 2005. Available on: <http://hmi.ewi.utwente.nl/verslagen/capita-selecta/CS-Nijdan-Niels.pdf>. Last accessed: 2-11-2013.
13. Hudson, R.: *Opera gets a Machover*, 2010. In: The Sunday Times. Available on: <http://operaofthefuture.com>. Last accessed: 22-10-2013.