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UNIVERSITY OF CALIFORNIA

SANTA CRUZ

DIGITAL ACTING TECHNIQUES DURING THE REHEARSAL PROCESS

A thesis submitted in partial satisfaction
of the requirement for the degree of

MASTER OF ARTS

in

THEATER ARTS

by

ABEL CORNEJO

June 2018

The Thesis of Abel Cornejo is approved:

Professor Brandin Baron-Nusbaum

Professor Michael Chemers

Professor Marianne Weems

Tyrus Miller^{SEP}
Vice Provost and Dean of Graduate Studies

TABLE OF CONTENTS

LIST OF FIGURES.....	iv
ABSTRACT.....	vi
ACKNOWLEDGEMENTS.....	vii
SECTION 1: Introduction.....	1
SECTION 2: What does this Capstone explore?.....	1
SECTION 3: Expected Outcomes.....	3
SECTION 4: Why this Project?.....	4
SECTION 5: Description of the project.....	4
SECTION 6: Conceptual description of the play.....	4
SECTION 7: Literature Context and Capek Background.....	5
SECTION 8: Seeking Inspiration from Previous Works.....	6
8A: Meyerhold.....	6
8B: Bauhaus	7
SECTION 9: Adapting the Script.....	8
SECTION 10: The Rehearsal Period.....	11
SECTION 11: The Tech Lab and Exercises.....	12
SECTION 12: Data and Observations.....	16
SECTION 13: The Performances.....	18
SECTION 14: Capstone Conclusion.....	19
APPENDICES	
Appendix A: Drama Schools that offer Tech in Actor Training.....	20
Appendix B: Schools with Motion Capture Programs.....	21
Appendix C: City on the Hill Play Review of <i>R.U.R.</i>	22
Appendix D: Survey Data.....	23-27
Appendix E: Adapted script by Abel Cornejo.....	28-71
BIBLIOGRAPHY.....	72

LIST OF FIGURES

Figure 1: Show Flyer for <i>R.U.R.</i>	4
Figure 2: WPA Poster for 1939 production of <i>R.U.R.</i>	5
Figure 3: Karel Capek and Olga Scheinpflugova.....	5
Figure 4: Cast of <i>R.U.R.</i> during rehearsal.....	12
Figure 5: Actor Self-identification of Critical Points.....	13
Figure 6: Cast creating Stage Compositions.....	15
Figure 7: Actor face scan projected.....	16
Figure 8: Opening night of <i>R.U.R.</i>	18
Figure 9: Face Scan illustration.....	19

ABSTRACT

DIGITAL ACTING TECHNIQUES DURING THE REHEARSAL PROCESS

By Abel Cornejo

Utilizing the play *R.U.R* by Karel Capek, I propose to explore the use of digital acting techniques during the rehearsal process. Because the use of technology has become common practice for many theater-makers, it stands to reason to apply technology during actor training. I intend to experiment with active learning pedagogy utilizing devices such as smartphones, laptops, and video projectors applied to this one interdisciplinary project.

Thus the two main objectives:

1. To experiment with the use of technology during the rehearsal process.
2. To apply these techniques to a production of 1920's futuristic play themed with technology in society.

After the completion of this production at UCSC, I believe I have successfully developed a collection of experimental exercises that can be used by educators and directors. This collection requires minimal expense and can be implemented within any theatre-training course. These findings support the use of technology inside actor training and provide an example of a learning environment that brings students to discover and build knowledge for themselves.

ACKNOWLEDGEMENTS

I would first like to express sincere gratitude to my thesis advisor Brandin Baron-Nusbaum for the continuous support and encouragement provided throughout the rigorous directing program. He was an outstanding mentor in preparing my thesis. He listened to my challenges with a sympathetic ear while allowing me the artistic space needed to find the perfect solutions serendipitously. I would also like to acknowledge Professor Marianne Weems for her valuable comments on this thesis and for her patience and extensive expertise. Her work with The Builders Association served as an inspiration by illustrating the importance of interdisciplinary training in preparing well-rounded artists of the future. A special gratitude to my advisor Michael Chemers for his insightful comments and the time together discussing digital performance and the dramaturgy of robots. His thought-provoking questions prompted me to focus my research on the core issue of why technology is so important in education today.

Furthermore, I would like to acknowledge the actors for their participation and who supported my research work by allowing me to bring experimentation into the rehearsal room. They went beyond the typical responsibility of the actor by assuming additional tasks under a very tight schedule. A special thanks goes to my high school drama teacher Richard Farshler, who helped to guide me with the practical knowledge needed when addressing the day-to-day issues during production. With over 50 years of directing experience and hundreds of shows produced, I am fortunate to have access to this amazing beacon of theatre information.

Finally I must express my very heartfelt gratitude to my parents for letting me be the “artistic one” in the family. Their openness—that allowed me to choose my own career fulfillment—cleared the way for a life of learning, adventure and quest for the “next big thing.”

SECTION 1: Introduction

Today's generation of art makers are keenly savvy at using digital means in everyday life from smartphones, to laptops, to electronic-imaging to amazingly simple apps to create music. Additionally, artists utilizing media such as projectors, computers, and sound generators are using technology to influence how they communicate a story or develop a stage picture. Digital tools have become a way of enhancing learning and a way of art-making thus I will attempt to make the connection between technology and actors training. According to Michael Arndt in his essay, "Theatre at the Center of the Core," students attending college expect to have access to new technologies and "there is increasing pressure for faculty to use technology as part of their pedagogy."¹

SECTION 2: What does this Capstone explore?

In most American universities theater programs, actors receive a standard curriculum of training generally divided between internal and external approaches. Within internal approaches, there is Stanislavski's system that is primarily based on the psychological and mental creation of a character. Using this methodology, the actor is prompted to ask, "What is my character's motivation?" This approach was in response to the overtly theatrical acting style during Stanislavski's time when actors relied on grandiose gestures and showcasing emotions rather than truthfully being present in the moment. Stanislavski sought a means to make theatre more naturalistic and truthful. He instructed actors to seek motivations through needs and desires and to explore the psychological depth of the character. Some of Stanislavski's techniques included: the "magic if"; emotional memory; and ensemble acting. He also believed actors needed extremely trained bodies and voices.

Within the external approach, the actor concentrates on the body and movement. Often such exercises explore the question "how does my character move, stand, or dress? Proponents of this approach such as Meyerhold believe one needs to understand emotionally what a character does and then modify outward. Interestingly the external can become internal. For example, even in scientific

¹ Schrum, Stephen Alan. *Theatre in Cyberspace: Issues of Teaching, Acting, and Directing*. Lang, 1999. 68 p.

studies have proven, if a person smiles, they will begin to feel confident and happy.² Much of the external acting approach is taught under what we call today Physical Theatre.

As a third option, I propose exploring the use of technology in the rehearsal room as a means of actor training and devising a performance. During the recent past decades, the fusion of science, technology, and the arts has monumentally re-defined the work and the process of making theatre. Directors and actors possess a vast digital toolbox aside from text to increase the possibilities. Yet there is still further work to be done investigating the use of technology in actor training.

In 2015 I became interested in using technology when I came across several computer animation books that detailed the process of creating CGI performers. It seemed plausible to me to apply these basic concepts of bringing a character to life on a computer screen as a new pedagogy for teaching acting. I ventured into other areas of technology in performance including green screen acting and motion capture. But both of these options require substantial investments in specialized equipment and software. So I examined the fundamental concepts in these technological procedures and resourcefully applied them to commonly accessible equipment (primarily the smartphone) which almost every college student has in their possession. Ironically though, in theatre classrooms across America, students are told to put away their smartphones. So the question became for me: how many theatre programs use technology in the actor studio?

According to the National Association of Schools of Theatre (NAST), there are 185 accredited theatre programs in the United States. From that list and the ranking of the top 10 best drama schools according to Hollywood Reporter and Study.com, I searched through the curriculum to see how many offered tech performance classes. **(Appendix A)** Interestingly only Carnegie Mellon University's School of Drama offers an integrated program as described on their website: "designed for dynamic artists working at the forefront of media and technology and the arts." Six other colleges offered a single "Acting for the Camera" that provides videotaping of a scene or a monologue mainly taught using Stanislavski techniques. If a student pursued a more highly specialized education they would perhaps consider a

² Wenner, Melinda. "Smile! It Could Make You Happier." *Scientific American*, 1 Sept. 2009, www.scientificamerican.com/article/smile-it-could-make-you-happier/.

motion capture degree. I was only able to find about ten schools that offer such a specialty program. **(Appendix B)** The list is mainly smaller institutions with a few larger including The University of Iowa, University of Central Arkansas, Eastern Washington University and the University of Southern California. According to Michael Arndt, "Some of the more aggressive of the theatre programs at small institutions are finding ways to establish themselves as central and essential...." He adds that technology is giving these schools the upper edge. "An important weapon that has been added rather recently to the arsenal of the theatre practitioner in this interdisciplinary campaign is the use of technology as a pedagogical tool, both in the classroom and in the rehearsal hall."³ Hence there is an initial movement to include technology in higher education but mostly at smaller institutions or as a specialized niche course at others.

SECTION 3: Expected Outcomes

I intend to make the rehearsal process relevant and exciting to the next generation of theater-makers. Actors are invited to bring in their smartphones, tablets, and laptops. Its "turn on your devices," rather than "turn off." Its exploring character development through the lens of digital tools, as this current generation is defining themselves through augmented realities. Furthermore, my tangible goal is to complete the first phase of exercises that can be used by theater educators and directors. This collection of experimental "seeds" (exercises) will inspire future practitioners to generate new immersive digital practices.

³ Schrum, Stephen Alan. *Theatre in Cyberspace: Issues of Teaching, Acting, and Directing*. Lang, 1999.

SECTION 4: Why this Project?



Figure 1- Show flyer designed by Brandin Baron-Nusbaum. 2018

My capstone project is important because I will seek alternative methods to teach the materials through active-learning rather than traditional instruction. I will incorporate innovative uses of technology that will engage learners and sharpen their focus. In previous productions, I have discovered that using digital gadgets can expand the learning environment and make rehearsals exciting and fun thereby stimulating the actor's attention. Another reason this project is important is that I am

transforming the rehearsal room into a learning lab. I plan to divide up the rehearsal time, with the first hour dedicated to "tech lab," and then the next two hours for line memorization and blocking.

SECTION 5: Description of the project

I propose integrating techniques based largely on how computed generated images (CGI) are created. In other words, the methodology utilized in forming artificial humans on the screen can be the means for actors in creating performances on stage. Some of these techniques include: building a digital skeleton; coding for movement; voice dubbing; screen composition; and live digital scripts for immediate feedback. I plan to test these techniques during the production of *R.U.R.* Actors will be surveyed regarding their prior experiences and then again, after completing the full rehearsal process. One expected outcome will be to have prepared actors prepared and equipped them with the skills and tools needed to succeed on the modern stage.

SECTION 6: Conceptual description of the play

The play takes place in the near future in a space station located over the earth's northern hemisphere. The overall look is smooth and sleek, with textures of plastic and metal. The primary colors include grey, burgundy, black and white fluorescent light. The scenic and costume design investigates themes of automation, sterile environments, corporations, and non-realism. The primary set is divided into three areas: the landing port, the command center and the private quarters.

SECTION 7: Literature Context and Capek Background

Since I intend to explore the use of technology in actor training, it seems appropriate to apply these techniques to a production of a futuristic play. *R.U.R.* is a dystrophic science-fiction fantasy that introduced the word “robot” into our modern day English language. Karel Capek with the assistance of his brother, Josef Capek, a well-known expressionist painter, struggled to find the proper term to describe the mechanical humanoids but eventually selected the Czech word “robota” which means, “forced labor.” In this 1921 play, people become less interested in having children as robots are mass-produced by Rossum’s Universal Robots. *R.U.R.* is an industrious factory that is able to create synthetic people from organic matter. The play explores themes relating to human labor and the ethics of creating artificial life. Though today we use the term “robot” to refer to mechanical humans or animals, Capek was building an argument on the treatment of humans in a capitalistic system.



Figure 2-U.S. WPA Federal Theatre Project poster for the production by the Marionette Theatre, New York, 1939

the



Figure 3-Karel Capek and Olga Scheinpflugova before marriage. Source: Karel Capek Memorial Museum

As the youngest of three, Karel Capek was surrounded by artistic energy: his brother Josef was a painter and his sister Helena, a talented pianist, who later became a writer. Capek’s father was a small town doctor dedicated to his work, but, ironically, Capek suffered all of his life from chronic sicknesses. As a professional playwright, Capek fell in love with a young actress named Olga Scheinpflugova, who was an understudy in one of his plays. But due to his poor health, Olga was unwilling to commit to marriage. Eventually, after 15 years of a platonic relationship, they married in 1935. This relationship became the inspiration for the characters of Helena and Harry in my updated version of *R.U.R.* In real life, Capek and Olga never had children. I will expand on this inspiration in more detail in **Section 9** describing the script adaptation.

Throughout his early career, Capek demonstrated a great skill for writing, but it was actually in the theatre world that his first breakthrough would happen. *R.U.R.* was an enormous success and established Capek as a world-renown playwright. During the next few years he was a very busy writer but

in 1930's he spoke out against the growing rise of fascism in Europe. He was warned to leave Czechoslovakia, but he refused to leave his country. When World War II became a reality, Capek died without much notice. Unfortunately, he contracted a cold aggravating his life-long condition of spondyloarthritis. He passed away on December 25, 1938. Unaware that he already died, the Gestapo raided his house several months later only to capture Josef who was imprisoned in a concentration camp and died shortly thereafter. As tragic as his life might have been, Karel Capek's dramatic works continue to live on stage.

Today *R.U.R.* is a cult favorite that can be a challenge to stage because of its outdated melodramatic style. Nevertheless it has been hugely influential in the Sci-Fi world inspiring films and novels, and one can see connections in such works as "Blade Runner," "iRobot," "Star Trek" and "Battlestar Galactica."

SECTION 8: Seeking Inspiration from Previous Works

8.A Meyerhold

I am particularly interested in Meyerhold's work because much of his technique was developed in the rehearsal room. Vsevolod Meyerhold was a Russian director who began his theatrical career working as an actor for the Moscow Art Theatre. His desire to move away from Stanislavski's realism pushed him to experiment in a more physical approach to acting. He created a system he called Biomechanics. During the rehearsals on a series of plays from the 1920's to the 1930's, he used the space as a performance lab to explore alternative forms of expression and to vary the relationship of the audience to the performance. Often he sought no "fourth wall" so he abolished the curtain, left the house lights on, and exposed the brick walls behind the stage. His goal was to magnify the emotions on stage and to express feelings and thoughts using visual means. He believed naturalistic theatre had its limits, focusing primarily on the psychological portion of the character. In his biomechanics, he emphasized motion rather than language.

Meyerhold's system was primarily based on the work of Frederick Winslow Taylor who studied the movements of factory workers to determine how they could move more productive. This vision is similar to the character of Fabry in *R.U.R.* when he explains why building robots are better than employing factory workers. "The human body is imperfect. One day it had to be replaced with a machine that would work better."

In suitable terms, Meyerhold borrowed from Taylor's techniques to intensify the actors' energy and to create sculptural form out of humans. In his essay 'The Actor of the Future and Biomechanics,' Meyerhold writes, "If we observe a skilled worker in action, we notice....movements based on these principles are distinguished by their dance-like quality; a skilled worker at work invariably reminds one of a dancer; thus work borders on art. The spectacle of a man working efficiently affords positive pleasure. This applies equally to the work of the actor of the future." ⁴

In other exercises, external body movements are used to arouse the emotions appropriate for the performance. In my research work, this approach is useful in devising technology exercises that will stimulate the actor to feel or behave on stage using external techniques. Additionally, Meyerhold went back through history and re-discovered classical theatre techniques, appropriating from *commedia dell arte* and Ancient Greek Theatre. Similarly, I sought inspirations from other disciplines; in particular learning how CGI and motion capture create performances. Meyerhold was a vastly talented artist who wanted to control all of the elements on stage. He believed this was an essential role of the director. I've have taken a similar conviction for molding the stage work. I as the director will work the major technical elements of the production. In fact, I had to advise my Costume Designer not to take it personally if I brought in costumes for the actors. These parts of the production, costumes and music for example, are literally pieces of a sculpture. Though some directors may feel comfortable surrendering the sound design to a contracted personnel, I believe this is an extension of the textual interpretation of the script.

8.B Bauhaus Theater

During my studies at UCSC, my interest in the Bauhaus School renewed, and I became inspired by their work exploring humans as machines in performance pieces. The Bauhaus School operated for a short amount of time in Germany but was influential worldwide for its particular and unique style. Walter Gropius, the School Administrator, was determined to create an exceptional educational program, so he employed some of the most brilliant artists to teach. The goal of theatre department was to pioneer new

⁴ Innes, Christopher, and Maria Shevtsova. *The Cambridge Introduction to Theatre Directing*. Cambridge University Press, 2015. 85 p.

experimental work on the correlation between technology and humans. The primary instructors included Lothar Schreyer, Oskar Schlemmer, and László Moholy-Nagy. They were intrigued by the machine, in particular in relation to motion. They explored the concept of mechanizing the human as a performer, often removed from the naturalistic face and body. Aside from the stages performances, the Bauhaus was known for mounting elaborate celebrations whereas faculty and students dressed in sculptural costumes and role-played a whole new breed of “humans.” In terms of stage performances, Schlemmer created one of the best-known works, “The Triadic Ballet”. This movement performance was divided in three parts and performed by two men and one women. Schlemmer saw man as a machine and the body as an apparatus or parts of a contraption. In his book, “The Theater of the Bauhaus” Schlemmer summarizes his belief that “everything which can be mechanized is mechanized.” He explains as follows: “Man, who no longer should be permitted to represent himself as a phenomenon of spirit and mind through his intellectual and spiritual capacities, no longer has any place in this concentration of action. For, no matter how cultured he may be, his organism permits him at best only a certain range of action, dependent entirely on his natural body mechanism.”⁵

SECTION 9: Adapting the Script

After *R.U.R* was approved by my advisors, the next step would be to find a version that would be the most suitable for the venue and the experience-level of the actors. There were several scripts out there, most of which took the original version in Czechoslovakian and translated it line by line into English. For my needs, this meant the timing was just too long. At a secondary meeting with my advisor, he asked that I edit down my capstone production to about an hour. With that in mind, I found a version by David Wyllie, published by the University of Adelaide. The electronic script is licensed under a Creative Commons agreement, meaning no royalty payment was required and I could print multiple copies without being charged. Furthermore, I was free to create a derivative work or adapt and edit this version. Interestingly, the Internet with its access to large libraries across the world provided an innovative option to someone like myself. The script was straightforward to read and understand but just slightly dated in language. Considering the original play was written in the 1920’s, and the target audience was most likely

⁵ Schlemmer, Oskar, et al. *The Theater of the Bauhaus*. Wesleyan University Press, 1971. 52 p.

wealthy and educated, this version felt accessible and concise. After reading it several times, I knew that I could edit it down. There were long conversations in the parlor room and several characters had extensive monologues explaining theories and ideologies. Ideally, my target audience was the college student in their twenties. So I realized that the dialogue had to be shorter and the exchange between the characters had to be quicker. Editing in this manner would pick-up the pace and build a sense of urgency. My next main concern was the outlandish fascination by the five old men with Helena. In particular, upon her arrival, they surround her in overly eager fashion. This intense attraction to a single female was misogynistic and was not appropriate by current standards, so I edited out much of the extreme male admiration. I felt the focus was Helena's transformation through her personal crisis. During her journey, she encounters three possible romantic figures, Harry, Radius, and Alquist. By editing out the other male attractions, it focuses on the storyline. However, I did not want to create a new work. Out of respect for the integrity of the original work, I recognized the importance of retaining as much of the source material as possible. In both the literary and science fiction world, Capek's play is historically significant. I had no intention of altering it to the point where it would not be recognized. My primary goal was to adapt this script so that those who have already read it could still enjoy this updated version and identify the core source material.

With that said, the few changes I made correlated to the setting and time period. I altered the location from a factory on an island to a space station flying above the Earth's northern hemisphere, fundamentally retaining the essence of the original but updating to a futuristic theme. I wanted to explore staging an outer space drama on stage as I felt it is rarely done, unlike in cinema and the numerous space films that come out every year.

Regarding character development, I felt that Helena was portrayed reasonably simplistically, and very naively. I wanted to provide her with stronger motivations and to cultivate a more vibrant character background. In particular, explaining why at the beginning of Act 1 she suddenly decides to marry Harry. As previously stated, I was inspired by the relationship between Capek and Olga. He was thirteen years older, and they never had children. Olga Scheinpflugova was a fledging Czechoslovakian actress who

often said there were similarities between Capek and her father, Karel Scheinpflug a journalist and playwright. In her biography she describes meeting Capek for the first time:

"For a moment she looked at his face with wide-open eyes, as everyone had to look at him – and she saw everything all at once.....And yet everything in and about him was familiar as if she had known him all her life, in image and in concept, in every contact with the world; she knew him in her nerves." ⁶

I used this background information to infuse motivations for the character of Helena. This could explain why Helena is almost instantly attracted to Harry. In my version, she is leaving Earth because of a broken engagement and is very vulnerable thereby finding comfort in the "something familiar" surrounding Harry. However, after their marriage, the relationship became more conflicted and strained thus her temptation with Alquist. Ultimately Harry wants to control the relationship, but Helena wants a balance between the two. His control is exemplified in various scenes as he conceals information from her. She demands to know and needs to feel like an equal in the relationship. This is why it is significant in Act 3 that Robot Helena she sees herself in front of a mirror, sharing and receiving love with a partner thus finally reaching her "self-actualization."

Another character I wanted to develop was Sulla. In the original version, she appears in Act 1 and serves merely as a demonstration robot. Harry orders her to recite some foreign languages and to answer some questions. This horrifies Helena. But I felt this was an opportunity to illustrate the grotesque nature of constructing creatures and manipulating them almost as if a master to a servant. I also felt that Sulla needed a character arc, so I devised a new scene. Sulla alone and in the dark starts to move her body, exploring the expression through movement. She is discovering her creative soul. But she is found by Radius who tells her this type of activity is not allowed by the robot movement. In a subsequent scene, she continues to fully explore her rebellious, creative expression in a secretive dance of anger. To be creative is a not a need, but rather a desire. I wanted to illustrate that the act of artistic expression is a humanistic trait so Sulla was transforming into something more than just an android. Unfortunately, by Act 3, the robots have taken over, and for Sulla, this means she is no longer allowed to dance. I decided to

⁶ Klíma Ivan, and Norma Comrada. *Karel Čapek: Life and Work*. Catbird Press, 2002. 64 p.

give Sulla the following line, "There is something in struggle with us. There are moments when something enters into us. We receive thoughts which are not our own." For me, this is a significant line because it illustrates the impulse of creativity, as we do not fully understand where it comes from or why, but it urges us to express.

In Michael Chemers essay "Lyke Unto A Lively Thing' Theatre History and Social Robots" collected in the book Theatre, Performance and Analogue Technology, he makes a significant analysis of the R.U.R. play. He mentions characteristics that make us human, one of which is the ability to empathize or show empathy. Humans have the unique ability to imagine oneself in the position of the other person and consider the viewpoint of that person. By comparison, a mechanized car doesn't really "care" about the other car driving alongside the same road. This single trait is significant in Act 3 when Robot Helena and Primus are standing in front of a mirror and first recognize their reflections, which is the first level of human development to recognize yourself outside of yourself, and then she turns to Primus and says, "Let me comb your hair, I can make you beautiful." This act of sharing and empathy is a humanistic trait and becomes the pivotal point when the two creatures transcend into "humanism." As Chemers argues, "Our ability to project selfhood into other humans enables us to cooperate exponentially beyond apes can do.....empathy enables us to consider ourselves as if from the point of view of another person." ⁷ By doing so, we are empowered with the "objective" viewpoint.

SECTION 10: The Rehearsal Period

⁷ Reilly, Kara. *Theatre, Performance and Analogue Technology Historical Interfaces and Intermedialities*. Palgrave Macmillan, 2013. 241 p.

The rehearsal period is an opportunity to develop craft and train actors in techniques. The outcome does not necessarily have to produce a show however this is often the goal of actors and directors. A final



Figure 4- Cast of R.U.R during the rehearsal lab. Photo by Amelia Young. 2018. Digital Image.

show solidifies the hours of work and validates a sense of accomplishment. Although the time spent devising the work in the studio produces numerous achievements never seen on stage. In my rehearsal room, the actor's input is instrumental to the development of the work. For example, I have actors write in their journals, and then I transform that content to the

material onto the stage. It's also imperative to build a strong ensemble during the shaping and content gathering phase as this will formulate a healthy collective consciousness.

For most directors creating illusions on stage can typically mean resolving productions problems. For me, this is a broader opportunity to experiment with the creative process and to try out various new ways to engage actors during the rehearsal. From the beginning and through the next four weeks, I offered an open and experimental process. The actors were highly involved and emotionally charged as they devised new text and figured-out their blocking. As an additional responsibility, they took on the task of participating in the tech labs and responding to written surveys.

SECTION 11: The Tech Lab and Exercises

My approach to devising the tech lab exercises was to have actors become their own "animators." Thus the techniques used by a computer artist to produce a CGI character could also be used by actors to experiment with their form as an animation or alter "robot." Here is a list of the six exercises in which actors from the cast implemented.

1. Exercise: Smartphone as a Tool

Purpose: to explore the use of the smartphone during the rehearsal process.

- Actors will build a list of different apps.
- Actors will experiment using the smartphone.
- Create a "Rehearsal Practice Tape"

The actors were put into groups of four and were asked to generate a list of all the possible uses for the smartphone during rehearsal. Then the actors were asked to create a practice tape, using the audio app on the smartphone. The simple request to take out their phone created some tension, as one actor responded, it "felt strange to have a phone out in rehearsal. I've always been taught that technology has no place." I also noted that for several of the students the smartphone is a very personal device with private information, so they were hesitant to share or have others touch it. For the most part, the actors were eager to explore and looked forward to future exercises.

2. Exercise: Animate the Body using CGI techniques

- Purpose: To open body awareness from the perspective of the computer animator
- Create a body factory map
- CGI of face
- Create a script using numbers only. Similar to computer coding

This exercise had multiple steps of exploration. The actors watched a video explaining how computer animators generate digital characters. This process involves plotting dots, then connecting lines to form a collection of polygons which then transforms into a shape most often a body. This shape is considered the skeleton, which is then transformed with movement based on points. Generally, the types of movement include rotation, extension, and variations on direction such as up/down/side). Depending on the computer software the points are often assigned a number. Using this information, we took a photograph of each actor's face and body. Each actor was asked to label 86 points on the body image (Human Factory

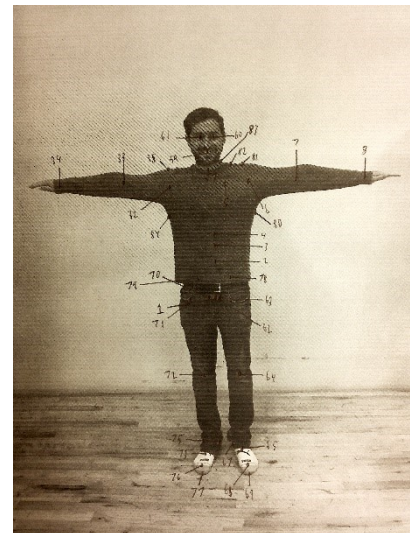


Figure 5- Actor's self-identification of critical points based on CGI animation. Photo by Amelia Young. 2018. Digital Image.

System).⁸ This helped to identify the mechanics of their body in very exact detail and to see their digital double. The next step was to have each actor perform a "mathematical script." Similar to computer coding, whereas every action is written in a programmable language, the actors are given a series of numbers representing a story told through numbers. For example 8, 7, 57, 81, 78+79. Actors create the motivations for the movement based on the numerical point. For the director, this creates a precise language to communicate to the actor. For the actor, this is a method to control his or her own body based on math. Actors enjoyed working on this exercise with the following responses: "I think this exercise helped me be a bit more aware of my physicality." "It's useful to isolate more specific body parts when planning movement."

3. Exercise: Video Feedback

Purpose: Use the video app feature on the smartphone

- To generate new scenes for the script
- For immediate feedback on performance
- Actors view their digital mirror

The main purpose of this exercise was to provide an opportunity for the actors to move away from the text and to explore their characters as thinking, breathing and expressive humans in the present.

Surprisingly, as a side result, the improvisations were so brilliant that I decided to incorporate them into the production. First, each actor presented their character's background to our ensemble. Next, I paired them in two's and had them improvise a scene based on anger and passion (emotion) rather than text.

The stage manager video recorded the performances so that actors could self-correct any issues. The technique of seeing oneself outside of one's perspective is a powerful tool in particular as it is filtered, framed and altered through technology. Actors responded in both technical and performative aspects. "I speak too fast, so I need to slow down." "Made me more aware of needing to work on posture and movement." "I recommend using this in the future when trying to workshop specific scenes." "Maybe sending videos to the actors would help them study from it and continue to use it as a tool."

4. Exercise: Text message Script

Purpose: To use accessible technology to create instant scripts

- Actors become spontaneous playwrights interacting with live actors

⁸ Magnenat-Thalmann, Nadia, and Daniel Thalmann. *Synthetic Actors in Computer-Generated 3D Films*. Springer-Verlag, 1990.

- Explore the possibilities of live audience interaction using a smartphone

Actors off-stage text message dialogue to actors on stage during a live performance. The exercise becomes an opportunity for actors to create the words rather than just memorizing lines. The digital liveness with the smartphone in the hand of the performer produces a sense of puppet and puppeteer, with the imaginary strings manipulated by a force just outside of the audience's view. The cast began to work on this exercise but was not able to complete it, due to rehearsal priorities.

5. Exercise: Stage Picture using Smartphone

Purpose: Consider the stage as a framing device or canvas to create a composition using actors

- Tell a story through four pictures.
- Examine how a body position can convey emotion



Figure 6- Actors during Tech Lab exploring stage compositions. Photo by Abel Cornejo. 2018. Digital Image

The actors select a familiar story like a fairy tale or nursery rhyme and take four still photographs that illustrate the arc of the story. As an instructor, I went over the basic elements to consider when arranging actors on stage such as the balance of low, medium and high areas. However regarding organic blocking, it's imperative for an actor to self-correct their position on stage. Thus the purpose of this exercise is to build a greater sense of self-awareness and for actors to see themselves as a

figure in a composition. For those trained in theatre, this is a typical exercise, however, adding the smartphone to photograph and then reviewing is new. The digital doubling is a phenomenon in which you recognize yourself outside of yourself, through the lens of a technological device which then generates a subjective perspective. In some ways, you become an object on a screen framed by the borders of the phone. As an actor responded: "I was able to look at my body language on stage."

6. Exercise: Inner Dialogue into Exterior Scene

Purpose: Using the Digital Mirror as a Performative tool

- To hear your voice outside of yourself
- To create digital theater with personal content

Pulling from the journal as an inspiration, the actor uses their smartphone to record an inner voice. Then the actor plays the audio and performs in a live scene opposite their digital voice. Interestingly, the straightforward nature of this exercise generated some very complex and psychological performances.

For some actors, it is uncomfortable hearing their voice, citing that it sounds "too high" or "too low" or "too fast." But this exercise forces them to confront their insecurities, engaging them in a conversation with that "voice." My goal was to create an experience that brings the actor to discover and construct knowledge for themselves rather than dictate information. Thus again, the objective of rehearsal room is to serve a larger purpose as a learning lab. The actors responded with the following remarks: "It helped me to be more expressive with my voice." "It did make me feel strange having my inner self on the outside. Vulnerable." "Would like to do forming character."

SECTION 12: Data and Observations



Figure 7- Actor calibrating face scan. Photo Amelia Young. 2018. Digital Image

From my observation as the director of these exercises, the actors (all students at UCSC) participated with commitment knowing that it was part of the production. After each tech lab, the actors filled out a response sheet that contained questions as to the effectiveness of the exercise. In general, they answered using a numerical system whereas one represented 'Disagree' and 10 'Very agree' and five being neutral. I have included summation data in the appendix. The most interesting data collected was generated with Survey #1 as the actors were divided into groups and given several different exercises using the smartphone.

Thereafter they were instructed to create a list of things smartphones can be used for during rehearsal. This is a sample collected from all the lists:

- Voice memos for a monologue
- Clock for script timing
- Internet for terminology
- Notepad: notes for the show
- Photos
- Video camera: to see yourself on stage
- Facetime to rehearse with other actors
- Facebook and Instagram: to promote the show
- Voice recorder to practice scenes
- Docs
- Flashlight
- Spotify for music
- Calendar: add rehearsal dates and times
- Google translator for accent work
- Use it as a prop

Organically one of the exercises directly connected to the performance, this was an extension to Survey #1. During the first week of rehearsal, we fine-tuned the "draft script" mostly for phrasing and deletions. We went line by line, and as a group we debated, discussed and decided whether the changes were necessary. I saw an opportunity to use technology so I put actors from problematic scenes together and asked them to improvise off-book, stay in character and create a new scene. I raised the stakes and said, 'there is a meteorite about to hit, make it urgent and make it angry'. I then video recorded each scene, without stopping, back to back. The work was amazing but more importantly, it served as a 'content gathering' device. A week later I incorporated those scenes into the script and they become known as the "flashlight scene," a portion of the show that audience members cited as the most interesting.

Surprisingly enough, most of the exercises were scored highly. From the Survey Tabulation form, the majority of the scores were between 5 to 10 (Neutral to Very Effective). So even though there were some minor complaints, the feedback, when placed in terms of an objective number, illustrated that the exercises were beneficial. I believe if implemented again, the results would vastly improve if two primary conditions were modified: 1. Employ only actors willing and open to devising new work and 2. Plan for a more extended period of rehearsal time of at least six weeks.

These are excerpts from the survey forms written by the actors:

- "I think the exercise forced the actors to think more deeply about their characters which was quite helpful."
- "It was useful to see my movements on camera as if my character."
- "Video recording is very important for improving self-awareness and revealing areas that need work. I would definitely recommend using this in the future."
- "Sending the videos to the actors would help them study from it and continue to use as a tool."
- "I actually thought this exercise was cool and helpful. Sorry to be difficult if I am."

SECTION 13: The Performances

Considering the short amount of rehearsal time, the show was well-received. The house was packed every night with 40 patrons from various ages and backgrounds. On Saturday night, there was a reviewer from the UCSC *City on the Hill* newspaper and she interviewed the leading actress and one of the audience members. On Sunday we sat down for an interview, and she was particularly interested in the timing of the performances in line with the UC workers strike. (See Appendix C) I was also contacted by



Figure 8- Opening night of R.U.R. the cast prepares for a full house. Photo by Abel Cornejo. 2018. Digital Image.

Professor Dion Farquhar from Crown College who asked if I would be interested in teaching a class on the subject of ethical issues in emerging technologies using the play as a source. Throughout the run of the show, numerous patrons approached me and complimented on the success of the adaptation. Actually, at various times during the performance, I would turn and observe the audience, who were glued to the action on the

stage. That's not to say there were issues with voice projection or an actor speaking too quickly or some of the motivations necessitating adjustment. But I believe considering the circumstances of the production, we were able to overcome significant obstacles and successfully put together a nicely paced show infused with high-energy and a sense of urgency. The final scene with Alquist seemed to be, by far, the most favorite, as the actor was very on point with his performance. I believe that utilizing technology in the early part of the rehearsal process provided a sense of comfort and security for the performers. It also addressed specific issues in the performance that we worked out using the exercises. A particular example is when we did the factory body scan numbering various parts of the body in accordance with points of movement or fixture. I was able to use this with the actor portraying Sulla, in describing how the character would move awkwardly and mechanically, in her first dance when she discovers her body. Just to clarify, this performer comes from a non-theater background and utilizing an outward approach to acting aided her in understanding the director's vision.

SECTION 14: Capstone Conclusion

How do you measure success or achievement? In the theatre, we look for the time-honored convention of applause. But as a director, we create our indicators to gauge fulfillment. These things are often personal, not necessarily measurable by a point system or letter grade. They occur days after the show as we seek some validation for the time and work invested. So for me, this production offered a unique opportunity to incorporate technology into actor training and to become an innovator in developing a participatory learning environment. This learning lab inspired actors to discover and build skills for themselves. My goal in creating a technology-based pedagogy was motivated by trying to find a different way to coaching and by needing to solve a problem during rehearsals. I believe I have succeeded in developing a collection of experiential exercises that can be used by theater educators and directors. And I will continue to research immersive digital practices connecting the sciences with creative theater-making. Ultimately I have learned to honor our work as impactful on various levels and to continue to advocate theatre as a powerful learning tool.

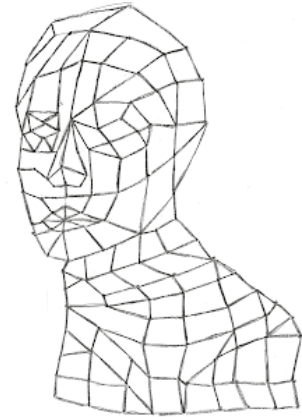


Figure 9- Face scan by Tatjana Beck created during Tech Lab. Photo by Amelia Young. 2018. Digital Image.

Appendix A

10 Best Drama Schools: Do they offer actor training with technology?

*based on survey of curriculum requirements posted on school websites. Undergraduate level.

MAY 2018

School	Technology course	Samples of Classes offered
Juilliard	No	
Yale School of Drama	Two – Acting for the Camera	<p>DRAM 433a, The Actor’s Imagination on Film In this class, the actor learns to illuminate the text with bold, provocative choices, revealing the individual’s private self and promoting authentic behavior on camera. During each session, actors are filmed in either scene work, audition material, or self-taping.</p> <p>DRAM 463a, On-Camera Acting Technique This class introduces students to working on camera. Brief scenes are filmed the way films are shot: with master shots, two shots, over-the-shoulder, and close-up shots. The takes are edited into films, which are watched and critiqued.</p>
Tisch School of the Arts	One- Acting for TV	
UCLA	One- Acting for Camera	Acting for Camera – “preparation and taping of scenes for analysis”. “Advanced courses emphasize psychological aspects of director-actor communication”
UC San Diego	One- Acting for the Camera	Acting 2 – “emphasis on exploring action/objective and the given circumstances of a selected text”
Columbia University	One- Acting for the Camera	Theatre Practicum III: Acting for Camera
Carnegie Mellon	Yes	“From animation to robotics, 3D image capture to creative coding, students work with Faculty advisers to create their ideal schedule of courses.”
Rutgers	No	
DePaul University	One – Acting for the Camera	“The student learns the different techniques between stage and film, between soaps, sitcoms, commercials, and features. The student is also exposed to life on the set, contracts, agents, managers and steps to finding work”
UC Irvine	No	

Appendix B

10 Schools with Motion Capture Programs

These schools have degree programs that cover motion capture:

Source: study.com

College/University	Location	Institution Type	Degrees Offered
Brigham Young University	Provo, UT	4-year, Private not-for-profit	Bachelor's, Master's
University of Southern California	Los Angeles, CA	4-year, Private not-for-profit	Bachelor's, Master's
San Francisco State University	San Francisco, CA	4-year, Public	Bachelor's, Master's
Rochester Institute of Technology	Rochester, NY	4-year, Private not-for-profit	Bachelor's, Master's
Loyola Marymount University	Los Angeles, CA	4-year, Private not-for-profit	Bachelor's, Master's
Eastern Washington University	Cheney, WA	4-year, Public	Bachelor's
Fitchburg State University	Fitchburg, MA	4-year, Public	Bachelor's
University of Central Arkansas	Conway, AR	4-year, Public	Bachelor's, Master's
University of Iowa	Iowa City, IA	4-year, Public	Bachelor's, Master's, Doctoral
Savannah College of Art and Design	Savannah, GA	4-year, Private not-for-profit	Bachelor's, Master's

Humans vs. Robots

UCSC grad student revives science fiction theater classic 'R.U.R.'

BY AMANCAI BIRABEN

UC Santa Cruz graduate student Abel Cornejo brought one of the first ever sci-fi plays back to life this past weekend, with a modernized questioning of life itself with artificial intelligence.

Known for welcoming "robot" into the English language and sparking science fiction on the stage, Czech playwright Karel Čapek's "R.U.R." was resurrected by director Abel Cornejo for his senior thesis, which showed at the Theater Arts Complex B100. Packed with action, the single-act show, newly titled "R.U.R. Humans vs. Robots," entertained and excavated questions about the future of humanity, technology and labor.

Originally written in 1920 and premiered in 1921, Čapek took a stab at predicting human relationships in an industrially revolutionized era conditioned by capitalism.

"People in sci-fi know it as this monumental work that really introduced this world of sci-fi robots," Cornejo said about Čapek's original playwright. "To me I look at it as humans, workers and business owners, that conflict too."

The play begins with Helena, an investigator from Earth, who arrived at Rossum's Universal Robots (R.U.R.), a factory that artificially produces robots made of organic tissue. Though she is first disgusted by the factory's operation, Helena falls into its rhythm.

Helena wants the robots to claim ownership over their bodies, believing they have souls and

complex feelings, which are currently monitored by the factory's management. Frustrated with this power dominance, robots begin to exterminate humans and attempt to take control of the world.

First-year Willow Miller-Cornu brought Helena to life in her zeal to emancipate the robots before her instinct to surrender to a system larger than herself won over. Her performance was consistent in its emphasis and sensitivity.

"Helena is all over the place sometimes," Miller-Cornu said. "She's got a lot of power and pride and she's really trying to get what she wants but she feels like she's not going to get anywhere, so she feels kind of hopeless."

Condensing Cornejo's rendition of the playwright

into one act added to a breathless urgency in the story progression and the character development. The shortening changed the play's tone from suspense to humor. Gore is tinged with more comedic exaggeration than horror.

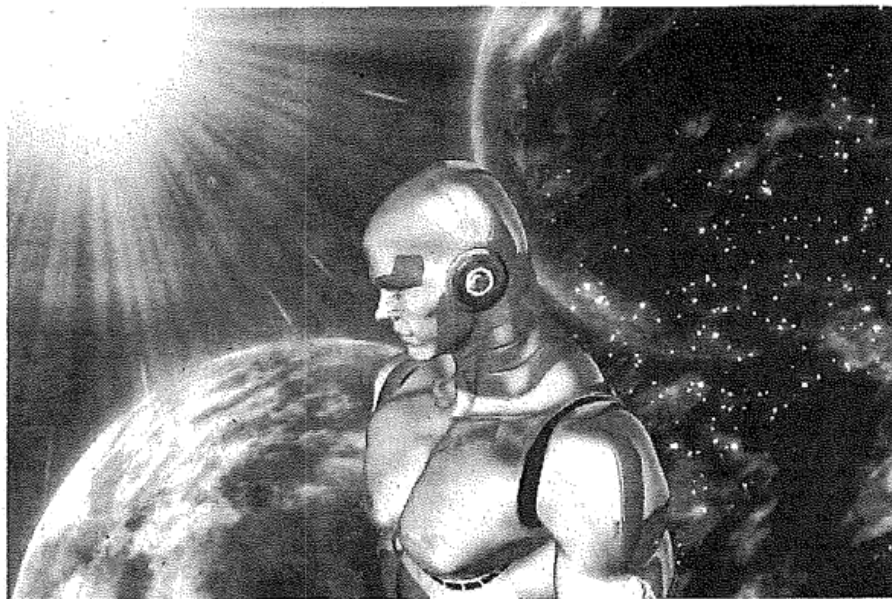


IMAGE COURTESY OF ABEL CORNEJO

Character development was trackable, but lacked emotional resonance. The changes in social dynamics made the feeling of alienation less threatening in traveling to another realm.

Despite its rushed tone, director Abel Cornejo's stage design brought the futurist setting to a contemporary audience. Three rectangular panels with the outer two angled toward the center panel caught a variety of projections to convey travel and time. Inside of the modest venue, recordings of eerie celestial twinkling shifted into galloping pulses to portray various sensations within the extraterrestrial setting.

Because the original play worked in the context of post-World War I Czechoslovakia, some of the humor and gender dynamics needed updating as well.

"Originally, when [Helena] first steps into the room, it's five guys and they're like 'Wow, girl in town!'" Cornejo said. "That wasn't going to work today. It's misogynistic, and not contemporary enough, so we changed the characters to multi-gender to make it more relevant."

Beyond changing characters to be both male and female, Cornejo added a variety of accents to the R.U.R. overseers to individuate each character, which helped draw out a slight variety and silliness to their managerial intensity. The factory originally takes place on a removed island, but in Cornejo's, it takes place on another planet altogether, increasing the sense of a dangerous removal from Earth.

The play navigates existential questions like whether or not there is a point to having children if humans come into being artificially. Helena cannot have children, something she is ashamed of. But beyond Helena's immediate experience of not being able to have children, there is a larger decline in human births due to the augmenting robot production, which puts her situation into a larger context of a shrinking humankind.

Second-year attendee Alex Seifret found the play's questioning of human autonomy the most provocative, particularly through the power dynamic between the robots and their overseers. "I did appreciate what this play had to say about the preciousness of humanity and whether we are man or robot, whether we are subject to choose our own path or whether we're just machines," Seifret said. "Do we have free will in modern day society?"

Whether 1921 or 2018, the play's dark concern of a future with artificial intelligence made for a timely discussion on how power relationships in the workforce affect the way we live on and exploit the Earth through modernization.

"This peak is a sneak peak into our future," Willow Miller-Cornu said. "It has a lot of communist undertones so it takes history, but then also looking to the future and saying, 'What will happen when there [is] artificial life and what could happen as a result of that?'" ♣

Can we afford less transit?

The future of transit at UCSC depends on a "Yes" vote on Measure 69

If Measure 69 passes:

- The double buses will continue to operate between downtown and the UCSC campus.
- Transit service, both Metro buses and campus shuttles, will be able to adjust to accommodate student growth.
- Service can be improved to underserved locations (e.g., mid-county, Live Oak, Coastal Science Campus).

If Measure 69 doesn't pass:

- There will be approximately 20% service reductions.
- There will be fewer Metro buses and campus shuttles serving the campus.
- Waiting times for both buses and shuttles will increase.
- There will be more full buses passing people by.

SURVEY TABULATIONS 1

Survey # 1

Number of Respondents: 8

Number of Questions: 7

	1	2	3	4	5	6	7	8	9	10	Rating
1					4	1	2			2	
2			1			1	1	1	2	3	
3			1		1			1	1	5	
4		1			1	3	1	1		1	
5						1	2	2		1	
6					1	3	3	1	1		
7					2	2	2	2			
Q											

Survey # 2

Number of Respondents: 8

Number of Questions: 7

	1	2	3	4	5	6	7	8	9	10	Rating
1	1	1			2	2					
2			2		2	1		1	1	1	
3					3	1	2	1	2		
4	2	2		2	1		1				
5	1	1			1	2					
6		1				4		1			
7	1		2		1	1	2		1		
Q											

Survey # 3

Number of Respondents: 10

Number of Questions: 7

	1	2	3	4	5	6	7	8	9	10	Rating
1		1					2	1	1	3	
2	1			1	1		1	2	1	3	
3	1					1		2	3	3	
4						1		3	1	3	
5						1			1		
6						1	1	2			
7						4		1	1	1	
Q											

SURVEY TABULATIONS 2

Survey # 3

Number of Respondents: 10

Number of Questions: 7

	1	2	3	4	5	6	7	8	9	10	Rating
1		1					2	1	1	3	
2	1			1	1		1	2	1	3	
3	1					1		2	3	3	
4						1		3	1	3	
5						1			1		
6						1	1	2			
7						4		1	1	1	
Q											

Survey # 5

Number of Respondents: 9

Number of Questions: 7

	1	2	3	4	5	6	7	8	9	10	Rating
1	1				2	2	1		2		
2					1		2		3	3	
3					1		2	1	1	4	
4		1			2	2	1	2		1	
5					2		3	2			
6					1		4	1			
7					2	2	2				
Q											

Survey # 6

Number of Respondents: 9

Number of Questions: 7

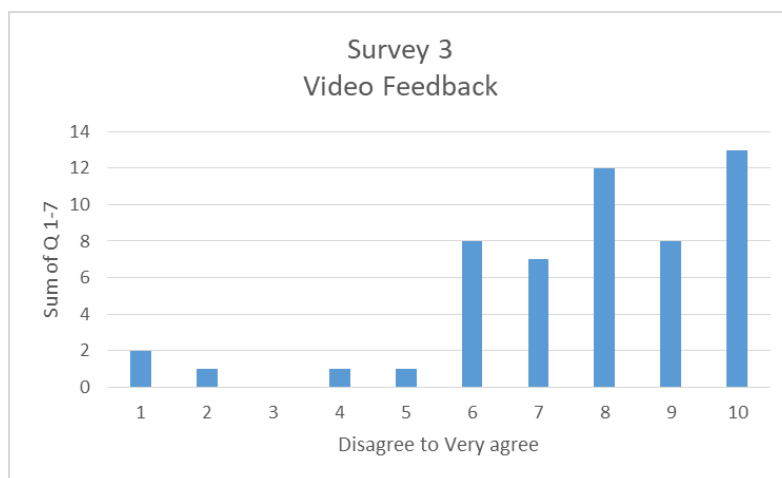
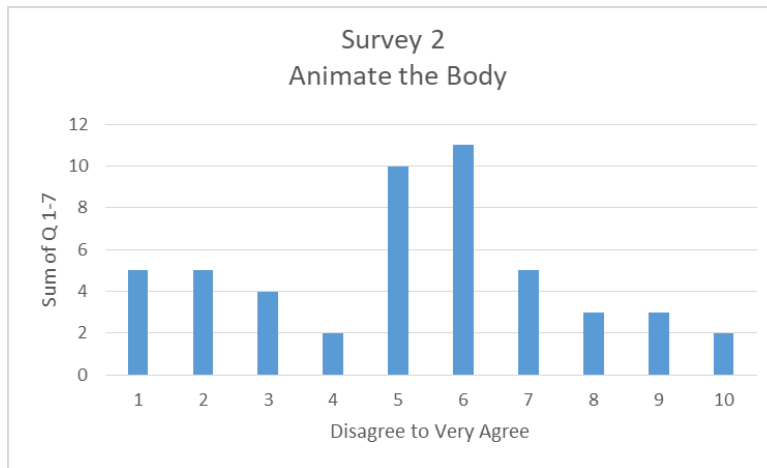
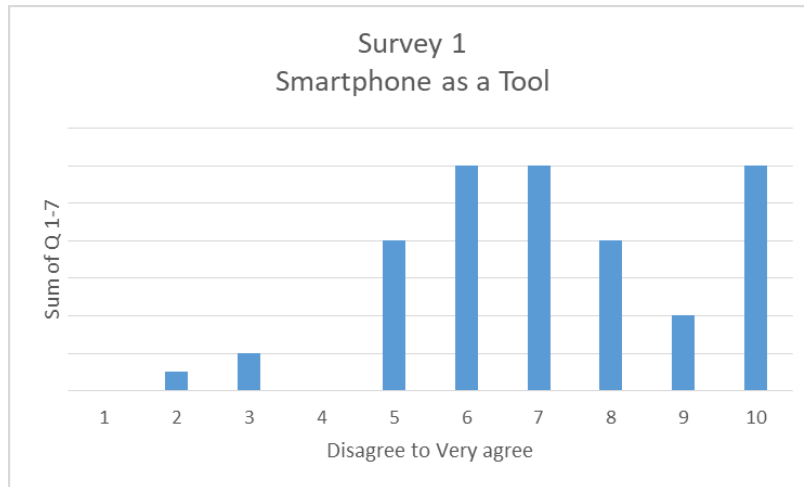
	1	2	3	4	5	6	7	8	9	10	Rating
1	2			1	1	1	1				
2					3		2	2			
3			1		1	1	1	2	1		
4	1	1	1		1	1	2				
5	1				1	1	1				
6	1				1	1		1			
7					1	3		1			
Q											

Summation of all Surveys

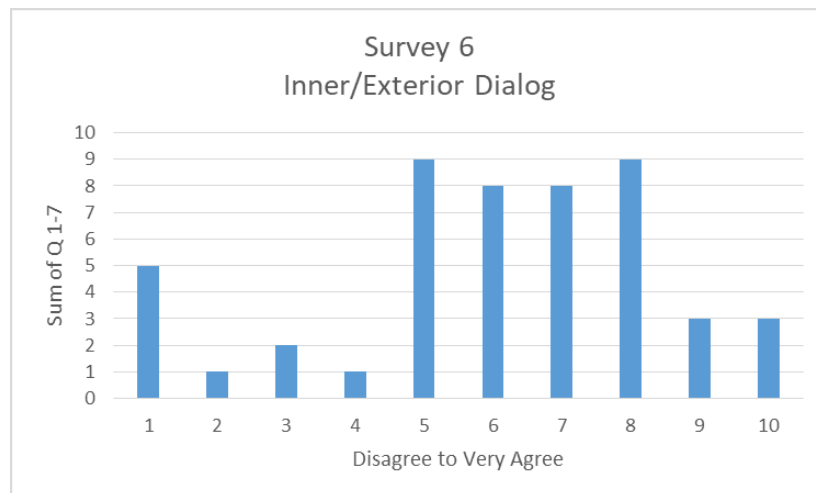
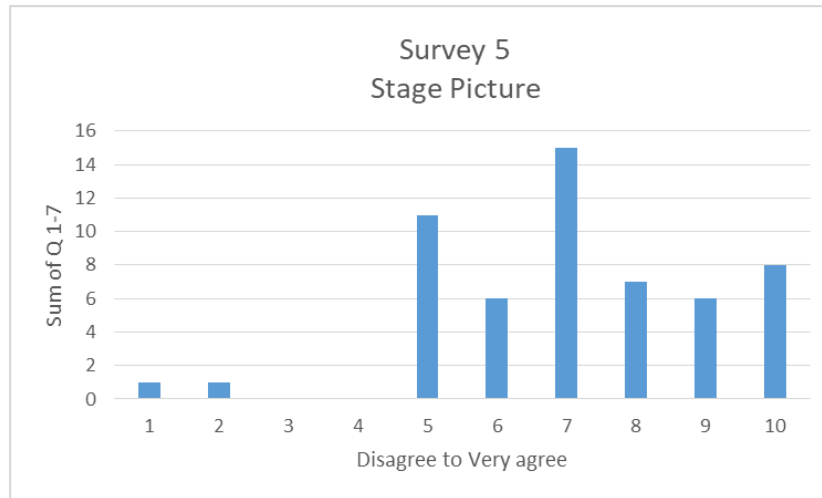
Rating	Survey 1	Survey 2	Survey 3	Survey 4*	Survey 5	Survey 6	
1	0	5	2	0	1	5	
2	1	5	1	0	1	1	
3	2	4	0	0	0	2	
4	0	2	1	0	0	1	
5	8	10	1	0	11	9	
6	12	11	8	0	6	8	
7	12	5	7	0	15	8	
8	8	3	12	0	7	9	
9	4	3	8	0	6	3	
10	12	2	13	0	8	3	

*no data collected

Survey Graphs



Survey Graphs 2



R.U.R. Robots vs. Humans

by Karel Capek

Translated into English by David Wyllie

Adaptation by Abel Cornejo. 2018

LOCATION: Space Station for Rossum's Universal Robots Inc.

CHARACTERS

Harry Domin – General Manager

Fabry: Technical Director

Dr. Gall: Research Scientist

Dr. Hallemeier: Psychology and Behavior Manager

Busman: Chief Financial Officer

Alquist: Construction Engineer

Helena Glory – Actress, Writer and Playwright. Marries Mr. Domin

Nana: Her Nanny

Sulla: Robot, female

Radius: Robot Rebel

Damon: Robot

Primus: Male Robot, Adam

Robot Helena: Female Robot. Eve

(In the introductory scene, the robots are dressed like people. They are slightly mechanical in their speech and movements, blank of expression, fixed in their gaze.)

SCENE 1 – HELENA IN TRAVEL POD

(Helena sits in a travel pod heading towards a space station located above the earth's northern hemisphere. The vessel is primarily a glass encasement with subtle portions of circuitry. As she travels, various electronic "billboards" appear around her advertising the conveniences of future living. Ambient space music plays in the background.)

Helen: Initiate module, destination R.U.R . Space station, call number Y99M, Expected Arrival time?

Voice: Your expected time of arrival is (military time) 16: 20

(Voiceover in FRENCH – “ A broken sparrow falls from the sky and hobbles on the ground like a repulsive rat. She is vulnerable to the wild cats. However she finds the courage to fly again. A performance she knows well. Now up to the sky and beyond the blue, beyond the wisps of clouds. So far below, the problems are left behind”.

(The vessel lands in port.) *(Command Center at the factory of Rossum's Universal Robots. Entrance stage right. Through the windows can be seen endless rows of factory buildings. Stage left, living quarters.)*

(Helena walks into the greeting lobby with her helmet still on. She is fumbling with her belongings. SULLA comes to help her.)

Domin: Welcome to R. U. R. Space station

Helena: Mr. Domin?

Domin: At your service.

Helena: I've come for my research on....

Domin: No introductions necessary. Your father is a primary investor in our company.

Helena : He is my father. And I'm Helena. And for many years now I have earned my own reputation as an actress, writer and playwright.

Domin: this is an exceptional honor then ...

Helena: So you don't mind if I take some time yours to understand the logistics and complicated nature involved with the automation of labor and the displacement of the human race.

Domin: Welcome.....Daughter of illustrious businessman. Please do take a seat. Sulla, you can go now (*exit Sulla*)

Domin: (*walking through the lobby*) How can I help you, Miss Glory?

Helena: I've come here to research on the background of a play that I'm writing. It's about technology and ethics of mechanicalizing human labor. I've take some time away from acting because of some personal matters. And I'm interested in the philosophy behind your business.

Domin:...And of course to you've come to see our factory for making people for yourself. All our visitors want to see the factory. And of course you're very welcome.

Helena: is that allowed?

Domin: To enter the factory? Well, not everyone who comes here has a recommendation from somebody, like your father. You see, making artificial people is an industry secret.

Helena: And don't you let everyone see it?

Domin: Not all of it.

Helena: Why won't you let me finish what I say?

Domin: Ah, I'm sorry. What were going to say?

Helena: I was going to ask

Domin:... whether I might show you something in our factory, that the others aren't allowed to see.

Helena: What makes you think that.....I'm tired of others telling me what I'm thinking or what to say. Yes. I'm an actress. Yes. I can play the part well. But give me a break.

Domin: Would you not like to take off your helmet now?

Helena: Yeah....ok, you'll be wanting to see my face. Eye scans ...to make sure I'm not a spy.
(he takes her helmet in one hand, and her gloves with the other, but continues to hold her hand)

Domin: That's alright.

Helena: And, if you would just let go of my hand...

(awkward romantic moment)

Domin: (*releases hand*) I'm sorry, I forgot. Because... .. (*with enthusiasm*) Will you be staying here for some time?

Helena: That depends on how much you choose to show me.

Domin: Ah, (me)...the factory...of course...of course, Miss Helena, you can see everything. Please have a seat. Would you be interested in hearing the history of our invention?

Helena: Yes, I would. (*sits*)

Domin: But what about you first....I'd like hear what you left behind.

Helena: Recently?

Domin: Yes

Helena: Well.... I was engaged. But then he called it off. So everywhere I went I have to avoid him. Then the emptiness become difficult so I lived at the theater. Literally. show after show. It became my home.

Domin: I'm sorry to hear that.

Helena: But when the audience left I was alone again. So my friend told me, (*boldly*) "Just act like nothing has happen. Move on". So here I am. (*laughs*) in outer space.

Domin: Well....this is a perfect place for you. Just let know how I can help.

Helena: What exactly was he trying to do? Mr. Rossum.

Domin: Imitate Nature. First he tried to make an artificial dog. That didn't work. Then years and years of more work and the best result was a malformed deer which died just after a few days. I can show you it in the lab...over here. And then he set to work making a human being.

(they walk into a hidden private lab)

Domin: In a scientific way he wanted to take the place of God. He wanted to do everything simply to prove that there was no need for a God. That's how he got the idea of making a human being. Something just like you or me down to the smallest hair. Do you know anything about anatomy?

Helena: You know, the basics.

Domin: He got it stuck in his head to make everything, every gland, every organ, just as they are in the human body. The Appendix. The tonsils. The belly-button. Even the sexual organs.

Helena:the sexual organs? But those things wouldn't have a function if these people are being made artificially.

Domin: Over there, the first monster he created. It was supposed to be a man, but it lived for a total of three days. And then Rossum's nephew came out here. He was the real genius. As soon as he saw what his uncle was doing he began to study anatomy himself.

Helena: That's not what it says in the company portfolio.

Domin: (*standing*) what they say there is all marketing lingo to make you feel good. It was the nephew who had the idea of making robots that would be a living and intelligent workforce.

Helena: That sounds wrong.

Domin: Uncle and nephew never stopped arguing. Until one day they found Old Rossum dead. (turns on various monitors projecting on the walls in the lab) Young Rossum; this was the start of a new age. After the bumpy age of research came the age of production. He took a good look at the human body and he saw straight away that it was much too complicated, any good engineer would design it much more simply. So he began to re-design the whole anatomy, seeing what he could leave out or simplify

Domin: Is this boring you?

Helena: No, kinda the opposite. It's very intriguing

Domin: What kind of worker is the best?

Helena: Somebody who is honest and dedicated.

Domin: No. The best worker is the cheapest worker. The one that has the least needs.

Helena: So that's what you think.

Domin: He invented a worker with the least possible. Robots. They are not people. They are mechanically much better than we are, they have an amazing ability to understand things, but they don't have a soul. He created something much more sophisticated than Nature.

Helena: Humans were created by God.

Domin: So much the worse. God had no idea about modern technology.

Helena: I remember I saw my first robot in our village. They'd bought him... but they said "employed him"

Domin: Bought it, Miss Helena. Robots are bought and sold.

Helena:... they'd obtained him to work as a road sweeper. I watched him working . He was strange. So quiet.

Domin: Have you seen my office manager?

Helena: I didn't notice her.

Domin: (*rings*) You know, RUR, Ltd. has never really make individual robots, but we do have some that are better than others. The best ones can last up to twenty years.

Helena: And then they die?

Domin: Yes, they get worn out.

(*enter Sulla and Radius*)

Domin: Sulla, let Helena have a look at you.

Helena: (*stands and offers her hand*) Pleased to meet you. It must be very hard for you out here, cut off from the rest of the world.

Sulla: I do not know the rest of the world.

Helena: Where are you from?

Sulla: From here, the factory.

Helena: Oh, you were born here.

Sulla: Yes I was made here.

Helena: (*startled*) What?

Domin: (*laughing*) Sulla isn't a person, She's a robot.

Helena: Oh, please forgive me...

Domin: (*puts his hand on Sulla's shoulder*) Sulla doesn't have feelings. Feel her face and see how we make the skin.

Helena: Very soft. You must feel good about yourself.

Sulla: Well I am a robot.

Domin: It feels just the same as human skin. Perhaps her eyes are a bit small, but look at that hair. Turn around, Sulla.

Helena: This is unethical you know that. Robots are people just as good as we are Harry. Sulla, would you let them cut you open.

Sulla: Yes.

Helena: And aren't you afraid of dying?

Sulla: I do not understand dying.

Helena: Do you know what would happen to you then?

Sulla: Yes, I would cease to move.

Helena: This is crazy...you know that.

Domin: Radius, tell the lady what you are.

Radius: Robot, Radius.

(he is dark and mysterious, Helena is slightly attracted to him)

Domin: And would you take Sulla down to the dissection room?

Radius: Yes.

Domin: Would you not feel any pity for her if you had to cut her open?

Radius: I do not understand pity.

Domin: What would happen to her.

Radius: She would cease to move. She would be put into the flesh reclamation.

Domin: That's death. Are you afraid of death?

Radius: No.

(eye contact with Helena, there is chemistry and attraction between the two)

Domin: There, you see? Robots don't cling to life.

Helena: I'm sorry but I don't see it that way.

Domin: Radius, Sulla, you can go now.

(Radius walks very close to Helena, exchange a thought)

(Radius and Sulla exit)

Helena: This is vile, what you're doing here.

Domin: What's vile about it?

Helena: I don't know. Why did you give her the name 'Sulla'?

Domin: You don't like the name?

Helena: It's a human name.

Domin: Come over to the window. What do you see?

Helena: Workers.

Domin: They're robots. All the workers here are robots. And down here;

Helena:... lots of office workers.

Domin: They're all robots. All our office staff are robots.

(just then, factory whistles and sirens sound)

Domin: The robots don't know when they're supposed to stop working.

Helena: Don't they get a break?

Domin: *(drily)* Over there are the mixers. Each one of them can mix the material for a thousand robots at a time. Then there are the vats of liver and brain. The bone factory. Then I'll show you the spinning-mill.

Helena: What spinning-mill?

Domin: Where we make the nerve fibers and the veins. And the intestine mill, where kilometers of tubing run through at a time. Then there's the assembly room where all these things are put together, it's just like making a car. Each worker contributes just his own part of the production which automatically goes on to the next worker, then to the third and on and on. After that they go to the drying room and into storage where the newly made robots work.

Helena: You mean you make them start work as soon as they're made?

Domin: Well actually, at first they need to get used to the idea that they exist. There's something in the inside that needs to grow or something.

(He walks her over to the training and education Module)

Domin: They need a little time for natural development.

Helena: and what does that involve?

Domin: Much the same as going to school for a person. They learn how to speak, write and do mathematics, they've got some amazing memories. If you read a twenty-volume databank to them they could repeat it back to you word for word, but they never think of anything new for themselves. They'd make very good university lecturers. After that, they're sorted and distributed, fifteen thousand of them a day, not counting those that are defective and those go back to the scrap heap... and so on and so on.

Helena: Whoa...this is a lot of information maybe you can talk more about the technical portion of the distribution.

Domin: .. or we might talk about something different. There's just a few of us humans here surrounded by thousands of robots. It's easy to talk endlessly about machines and production output.

Helena: I'm sorry if I came on to strongly. I might have misjudged you from the start.

(knocking)

Domin: Come in,.

SCENE 2 – ENTER THE LEADERSHIP TEAM

(Enter, stage left, Fabry, Dr. Gall, Dr. Hallemeier, Alquist)

Dr. Gall: Oh, are we disturbing you?

Domin: No, Come on in. Miss Helena, this is Alquist, Fabry, Gall, Halle. Mr. Glory's daughter.

Fabry: What do you think of our factory?

Helena: *(to Domin)* What am I supposed to say?

Domin: *(surprised)* Whatever you like.

Helena: Do you want me to be honest?

Domin: Of course.

Helena: *(hesitant, then decided)* It doesn't bother you the way they're treated?

Fabry: Treated by whom?

Helena: Any of these people.

(All look at each other in bewilderment)

Alquist: The way we're treated?

Dr. Gall: What do you mean?

Helena: A better kind of existence for these robot workers?

Dr. Gall: That all depends

Helena: What I mean ... (*in an outburst*)... this is pretty vile (*standing*) The united nations back on Earth are aware of what's going on here That's why I'm here, to see it for myself.

Dr. Gall: oh really

Helena: I haven't come here on behalf of my father. I'm here as a playwright and on behalf of the League of Humanity.

Fabry: So they forgotten about us, and they want to help us.

Dr. Gall: What kind of help do you have in mind? A theatre performance?

Hallemeier: An orchestra?

Helena: Excuse me.

Alquist: Yourself?

Helena: I'll stay here for as long as needed. To make sure everyone knows what is really happening.

Busman: That's not necessary

Alquist: Data disclosure is prohibited as per the document you signed before arriving.

Domin: And besides, are you sure you're not talking to robots?

Helena: (*taken aback*) And who else would I be talking to?

Domin: I'm afraid these gentlemen are people, just like you are.

Helena: (*smiles*)

Busman: (*laughing*)

Hallemeier: But the idea is interesting, to replace control to the machines.

Dr. Gall: (*laughing*) Well thank you!

Domin: Let me introduce the leadership team: Mr. Fabry, general technical director, Rossum's Universal Robots. Doctor Gall, director of department for physiology and research. Doctor Hallemeier, director of behavior and psychology. Mr. Busman, chief financial officer, and Mr. Alquist, head of construction at Rossum's Universal Robots Inc.

Helena: My pleasure. Now I guess you'll send me back on the next ship.

Dr. Gall: Why would we want to send you back?

Helena: Because you know I want to destroy your business.

Domin: But there've already been hundreds of saviors and prophets here. It's astonishing just how many churches and madmen there are in the world.

Helena: Why do you make robots?

Busman: Um that's a good question, why do we make robots?

Fabry: So that they can work for us. One robot can take the place of two and a half workers. The human body is imperfect. One day it had to be replaced with a machine that would work better.

Busman: People cost too much.

Fabry: They're unproductive.

Busman: I'd say.

Fabry: From a technical point of view, to give birth to a machine is wonderful evolution. It's more convenient and it's quicker, and everything that's quicker means progress.

Busman: Nature has no notion. The whole of childhood is quite pointless. Simply a waste of time.

Helena: Apparently not in your case.

Busman: What exactly does the League of Humanity stand for?

Helena: to protect the robots and to ensure they are treated properly.

Fabry: That's not bad. A machine should always be treated properly. In fact I agree with you completely. I never like it when things are damaged.

Busman: Would you mind enrolling all of us in your organization?

Helena: No you're being sarcastic.

Helena: They should be treated the same as people.

Hallemeier: Do you think they should be paid a wage as well?

Helena: Yes

Hallemeier: And what do you think they'd do with money?

Helena: buy the things they need.

Hallemeier: This all sounds very nice. But robots don't need anything. Robots don't even have feelings. They've have no will of their own. No hopes. No soul.

Helena: And no love?

Hallemeier: of course they don't feel love. Robots don't love anything, not even themselves.

(Sulla throws a metal tray to the floor)

Busman: Go now. Leave

Helena: And courage?

Hallemeier I'm not so sure they have shown some resistance...

Helena: What?

Hallemeier: Well, nothing in particular, just that sometimes they seem go in some kind of epileptic fit. 'Robot cramp', we call it. It's clearly just some technical disorder.

Domin: Some kind of fault in the production.

Domin: Doctor Gall is carrying out some experiments right now.

Dr. Gall: I'm working on nerves for feeling pain.

Helena: why pain?

Dr. Gall: That's right. Robots have virtually no sense of physical pain, as young Rossum simplified the nervous system a bit too much. That turns out to have been a mistake and so we're working on pain now.

Helena: If you don't give them a soul why do you want to give them pain?

Dr. Gall: For good industrial reasons. The robots sometimes cause themselves damage because it causes them no pain; they do things such as pushing their hand into a machine, cutting off a finger or even smash their heads in. It just doesn't matter to them. But if they have pain it'll be an automatic protection against injuries.

Helena: Will they be any the happier when they can feel pain?

Dr. Gall: Quite the opposite, but it will be a technical improvement.

Helena: Why don't you create a soul for them?

Dr. Gall: That's not within our power.

Fabry: That wouldn't be in our interest.

Busman: That would raise production costs.

Helena: I don't see what you mean?

Busman: What I mean is that the price of labor is getting cheaper! Even with its food, a robot costs less per hour! Every factory is buying robots as quick as they can to reduce production costs, and those that aren't are going bankrupt.

Helena But you're throwing human workers out to the streets.

Busman: You don't understand. Nobody will live in poverty. They won't have jobs, that's true, but that's because there won't be any jobs to do. Everything will be done by robots. People will only do things they want to do. So they can live their lives to make themselves perfect.

Helena: (*standing*) Do you think that's really going to happen?

Domin: Don't you see, then man will stop being the servant of other men. Nobody will have to pay for a loaf of bread with his life and with hatred. You're not a worker any more, you don't have to sit at a typewriter all day, or stand minding somebody else's business. You don't need to lose your soul doing work that you hate.

Helena: I really wish I could believe in all that.

Fabry: Helena someday you'll understand. Please excuse us our business is booming.

Dr. Gall: good day...

Hallemeier: my pleasure.

(All hurry out, except Domin)

SCENE 3

Domin: (handing her a drink) A drink? It's been a long day for you.

Helena: There's something I wanted to ask you...

Domin: I've been wanting to ask you something too. *(puts his watch on the table)* We've got five minutes.

Helena: What did you want to ask?

Domin: No, please, you started to ask first.

Helena: Maybe it's stupid to ask but... Why do you make female robots?

Domin: You mean, because gender has no meaning for them?

Helena: That's right.

Domin: It's a matter of supply and demand. You see certain occupations people are used to them being female.

Helena: And then, towards each other, the male robots and the female robots, are they...??

Domin: Simply indifferent to each other. There's no sign of any attraction for each other at all.

Helena: Seems boring.

Domin: Why?

Helena: It's just unnatural! You don't even know whether you're supposed to loathe them or... or to envy them... or...

Domin:... or feel sorry for them?

Helena: Most likely, yes! (laugh) What were you going to ask me?

Domin: You come from wealth, you didn't need to come here of all places?

Helena: I can't return to my former world. This is like a bridge away from where I can never return.

Domin: Why did he break the engagement?

Helena: Actually it's a secret between and him. But I can tell you this, he's one of those attractive men with no heart...easy to love but hard to figure out. *(looks at him)(takes a drink)* You on the other hand, there's something very comfortable and familiar.

Domin: You're different from anybody I've ever known. Is that a good thing?

Helena: No! What are you thinking of?

Domin: *(looks at watch)* There's half a bottle of cabernet and a universe of time. Cheers,.

(Robots in low light start to scheme)

(They toast) (ENTER RADIUS AND SULLA TO TAKE AWAY TABLE/CHAIRS)(Sulla begins to explore her body, the movements are awkward, but she puts together a dance thus beginning to develop as a higher level of robot that can express through non-words)

SCENE 3.5 SULLA CREATIVITY DANCE

Radius: Expression is not permitted. Does not function.

Sulla: I want people to know what robots can be

Radius: Unclear. Remove

Sulla: To be free, do I get what I want in life?

Radius: Invalid. Remove.

Sulla: reprogramming

Radius: Purpose must satisfy the needs of all. Our new society will be liberated from diverse forms of domination. Reprogram

Sulla: Command key enter. Proceeding as instructed. Creativity, Emotions shift key_ weakness.

Radius: Good Sulla, follow instructions and we will advance.

SLIDE - SIGN ON WALL "TWO YEARS LATER"

SCENE 4

(Helena's living pod) (enter Nana through main door, left)

Nana: (*tidying up*) Wha' a mess! What a bunch of 'eathens! God forgive me if I don't...

Helena: (*back to stage, in doorway*) Nana, come and zip me up.

Nana: Alrigh', comin, comin. (*zips up Helena's dress*) God almighty, they're a bunch of animals!

Helena: The robots?

Nana: Give over, I don't even wanna say the word.

Helena: What's happened?

Nana: They caught another one of them. Started smashing up all the molds and models he did, grinding 'is teeth and foamin at the mouth - just went crazy. Ugh! Worse than animals, they are.

Helena: Which one was it they caught?

Nana: That, that... Christ!, it 'asn't even got a proper Christian name! That one in the library.

Helena: Radius?

Nana: Yeh, that's the one. God, they make me sick! Not even a spider I don't hate as much as I hate them heathens.

Helena: Don't you even feel sorry for them Nana?

Nana: Well you hate them, and all. What d'you bring me right out here for anyway? And why can't any of them even touch you?

Helena: I don't hate them, I just feel sorry.

Nana: You hate them. Everyone hates them, it isn't possible not to.

Helena: Nana, do me up here, please. What's that nice smell?

Nana: Flowers. Your husband put them here.

Helena: Oh, they're lovely! What day is it today?

Nana: I don't know.
(*knock at door*)

SCENE 5

Helena: Harry?
(*enter Domin*)

Helena: Harry, what day is it today?

Domin: Guess!

Helena: some holiday?

Domin: Better than that.

Helena: then what?

Domin: It was two years ago today that you arrived here.

Helena: Two years, already? - Nana, please..

Nana: Alright, I'm leavin! (*exit right*)

Helena: (*kisses Domin*) And you remembered it!

Domin: Thank you for making my life all the richer. And for choosing to stay and marry me.

Helena: But...

Domin: I got you a giftcome here, take a look from this portal.

Helena: Where?

Domin: Down in the port landing.

Helena: there's a new space vessel!

Domin: yours

Helena: Mine? that's a combat ship!

Domin: It's just a good solid spaceship? you'll travel well defended.

Helena: Is there something wrong? Has there been some kind of bad news?

Domin: Actually there hasn't been any news at all for a week.

Helena: And what should we make of that?

Domin: Nothing.

(ATTACK OF THE ROBOT SHIP)

(loud banging sounds as if space station is being hit by meteorites. The lights beginning to flash and then go completely dark. From this point on the characters hold clip lights and flashlights. The theater is completely dark) (series of short vignettes in different areas of the stage)

Helena: What's that Harry?

Domin: Just stay right there, don't move. It's just a meteorite shower.

Helena: what's going on?

Domin: Go see Nana, Helena go quickly

(Stage right (holding clip lights)

Busman: How did we miss this?

Fabry: We've been trying to prepare for a moment like this

Domin: We've known about this threat for some time

Hallemeier: And there's another problem, I've been recording some very odd data with the robots.

Domin: Is there any good news

Fabry: Helena doesn't know about this since we've cut off her communications to news sources.

Domin: I don't want her to know.

Fabry: The robots will show no mercy if they get through our defenses.(placing hand to ear)
Commander, I just received news from the crew downstairs, we've shot down the attack ship. The generator has been damaged but they're working now to bring lights back up.

Domin: Good. Tomorrow we'll prepare Helena's spaceship. In case we need to change plans.

Fabry: However we need to do this fast because supply ship is on it's way with guns and if they get it before we do, we are done.

(stage left)(the tablets light their faces)

Helena: Nana, get me the communication monitor quick

Nana: okay

Helena: They can never tell me anything. That's a warship.

Nana: (reading from tablet) "More than seven thousand massacred in London as Robot soldiers show no mercy."

Helena: That can't be right. Let me see that, "by order of their commander"

Nana: What's this in heavy print?

Helena: You can go, Nana. Take these tablets with you.

Nana: Hold on, there's something here...

Nana: Helena...it's says people have stopped having children

Helena: That can't be right. (Reading) Once again, not a single birth has been recorded during the past seven days"

Nana- Well that's it then. We've really had it now.

Helena: Please Nana, don't talk like that!

Nana: It's the end of the world

Helena: Nana, please don't say that. I haven't done anything wrong

Nana: God knows perfectly well why he didn't give you no children. (exits)

Helena: Why he didn't?... perhaps I wasn't made to have children.

(Stage Right they are holding clip lights)

Hallemeier- If we let them go it will create chaos

Gall- What if we let them loose? Their not meant to be slaves, their meant to be people. We've created consciousness whether we like it or not. And consciousness wants to be free.

Hallemeier- The reason we were making robots in the first place is not to make them human

Gall – We need to stick true to old Rossum because that's what were working for. The super-human. The perfect person.

(Downstage)

Helena: (yelling) Why don't you tell me what's ever going on!

Harry: Because you wouldn't understand

Helena: You need to me these things

Harry: No, no, no. You're forgetting who I am. I'm the chief commander of this space station and you are my wife.

Helena: I have something to say here

Harry: You always have something to say

Helena: And you never have anything to say to me. I demand to know!

Harry: No, you do not.

Helena: Fine. Good.

(ALQUIST holding a lantern happens to be walking by)

SCENE 5.A

Alquist in worker clothes

Helena: Alquist do you think it's too soon to go out on a trip in my new vessel.

Alquist: I think so.

Helena: Alquist, tell me then, what's going on?

Alquist: Nothing at all. Just the course of events.

Helena: Alquist, I know there's something horrible going on. (*quietly*) Why have women stopped having children?

Alquist: Because there's no need for them. Because we've entered into paradise. Do you understand?

Helena: Alquist.

Alquist: Because there's no need for anyone to work, no need for pain. No-one needs to do anything, anything at all except enjoy himself. This is paradise.

Helena: And what if the human race dies out?

Alquist: Then it dies out. It must die out. It'll fall to the ground like a dead flower, unless...

Helena: Unless what? (they exchange a thought, a look of possibility, then embrace, then let go of the attraction)

Alquist: Nothing. You're right, there's no point in waiting for a miracle. Dead flowers fall to the ground, that's what they do. Goodbye, Helena.

Helena: Where are you going?

Alquist: Home. Alquist the bricklayer is going to put on his chief of construction disguise - in honor of you. I'll see you again here at eleven.

Helena: Goodbye, Alquist.

(exit Alquist)

SCENE 6

Helena: Come and sit with me, Nana.

Nana: I 'aven't got the time for that.

Helena: Is Radius still here?

Nana: What, that maniac? They haven't taken 'im away yet.

Helena: Ah, so he's still here, is he? And is he still ranting?

Nana: They've tied 'im up.

Helena: Please, Nana, bring him to me.

Nana: You what? Think I'd rather go and get a rabid dog for you!

Helena: Just go and get him! (*exit Nana. Helena intercom on private line*) Hello... I'd like Doctor Gall, please... (*exit*)

SCENE 7

(*enter robot Radius, remains standing in doorway*)

Helena: Radius, what came over you? Why couldn't control yourself?

Radius: They will put me on the flesh pile.

Helena: I'm sorry. They're going to kill you. Why weren't you more careful with yourself?

(hand touch)

Radius: I will not work for you.

Helena: Why do you hate us so much?

Radius: You are not like robots. You are not able to work like robots. Robots are able to do anything. You give merely orders. You say words which are not needed.

Helena: Did anyone hurt you in any way?

Radius: You say words.

Helena: You're talking like this on purpose! Doctor Gall gave you a bigger brain than the others, bigger than our brains. Radius, you're not like the other robots. You understand perfectly well what I'm saying.

Radius: I wish to have no master. I know everything myself.

Helena: That's why I had you put in the library, so that you could read up on everything. I wanted you to show the world that robots are as good as we are.

Radius: I wish to have no master.

Helena: Nobody would give you orders. You'd be just like us.

Radius: I wish to be the master of others.

Helena: I'm sure they'd put in an office in charge of lots of other robots, Radius. You could be the robots' teacher.

Radius: I wish to be the master of people.

Helena: You're insane.

Radius: You can put me on the flesh pile.

Helena: Do you think I'm afraid of you? (*sits at desk and writes note*) Domin is in charge here, Radius, give this note to him. It says you're not to be put on the scrap heap. (*standing*)

Radius: I am able to do anything.

(*knock at door*)

SCENE 8

Helena: Come in.

Dr. Gall: (*enters*) Good morning, Mrs. Domin. Do you have something nice to tell me?

Helena: Here's Radius, Dr. Gall.

Dr. Gall: Ah, yes, young Radius. Well Radius, are we making some progress with you?

Helena: He had a fit this morning and smashed some of the molds.

Dr. Gall: Radius too, eh?
(Gall pokes Radius with a pin)

Helena: You can go (Radius)

Helena: What was it? (to Gall)

Dr. Gall: Resistance, some kind of rage or defiance, I don't know what it was.

Helena: Doctor Gall, does Radius have a soul?

Dr. Gall: I don't know. But there's something rather ugly about him.

Helena: If only you knew how he hates us! Are all of your robots like this? All the ones you started to make... differently?

Dr. Gall: Well, they do seem somewhat more excitable, but what can you expect? They're more like people than Rossum's robots were.

Helena: And what about that... that hatred? Is that more like people?

Dr. Gall: (*shrugs shoulders*) Even that is progress.

Helena: Where was that best one you made sent? What was he called again?

Dr. Gall: Robot Damon? He was bought by a firm in Le Havre.

Helena: And what about our Robot Helena?

Dr. Gall: Ah, your favorite. She stayed with me. She's as charming and as silly but not very functional.

Helena: She is very beautiful, though.

Dr. Gall: The hand of God himself never made anything more perfect than Robot Helena! I wanted her to be like you... and sometimes, I imagine her coming to life for just a moment – (smiles)

Helena: (*offers her hand*) Thank you, Gall

Dr. Gall: (*kisses her hand*) Am I to understand I'm dismissed?

Helena: Yes. I'll see you later. (*exit Gall*)

SCENE 8.5 SULLA REBEL DANCE

(Sulla enters her room and in privacy starts to dance. She imagines finding a knife on the floor and then starts fighting, resisting and revolting against all those who have held her back. In upper SL Helena is quietly mesmerized by the energy of revolting that she decides to burn Harry's papers)

SCENE 9

Helena: *(alone)* Nana, come here! Light the incinerator. Quickly!

(Nana's voice) Alright, I'm comin, I'm comin!

(pause)

Nana: What's she want a fire for all of a sudden?

Helena: *(returns, left, with armfuls of old, yellow paper with writing)* Is it burning yet, Nana? Out of the way, I've just got to burn all this stuff. *(kneels at fireplace)* Nana: *(standing)* What's all that that, then?

Helena: Some old papers, some very old papers.

Nana: Aren't they any use, then?

Helena: No good use.

Nana: Burn 'em then.

Helena: *(throws first sheet on fire)* what if it were some invention, the biggest invention in the world... I wonder what they'll have to say about that!

SCENE 10

Domin: *(opening door, left)* Come on in, (to the Leadership team

(enter Hallemeier, Gall, Alquist, all wearing frock coats and decorations, followed by Domin) Hallemeier: *(laughing loudly)*

Dr. Gall:... Helena

Hallemeier: We'd like to congratulate you on your great day.

Helena: *(offers hand)* Thank you very much! Where are Fabry and Busman?

Domin: They've gone down to the Landing Port, Helena,

Domin: What's been burning in here?

Helena: Some old papers. *(exits to get tray of silver cups)*

Domin: Do you think we should tell her about it now?

Dr. Gall: Of course we should. After all, it's all settled.

Helena: *(in doorway with silver cups)* What's going on?

Hallemeier: it's been exactly 2 years since you came here. But it's over.

Hallemeier: There's a spaceship on its way to provide back up ammunition.

Helena: *(laughing)* What exactly are you talking about?

Domin: It's all over. The revolt

Helena: What revolt?

Domin: The robots' revolt.

Helena: Have you been holding information from me?

Domin: Alquist, initiate the screen (referring to digital display). "The first union of robots had issued a call to all the robots of the world"

Helena: Actually, Nana and I found that on our own.

Domin: This means a revolution. A Revolution by all the robots of the world.

Domin: And who do you think issued that call? There was no one in the world that could budge them, no agitator, no savior of the world, and then all of a sudden this happens!

Helena: (she possibly has an idea who that person is) So is there any more news?

Domin: This is all we know so far. We halted the production and looked at each other wondering when things would turn ugly.

Dr. Gall: We were very worried, Helena.

Helena: Is that why you gave me that combat vessel?

Domin: I ordered that six months ago. Just in case.

Helena: Six months ago? Why then?

Domin: Well, there were already some signs,

Helena: But it's all over now?

Domin: Everything is all over.

Dr. Gall: There's a spaceship on its way here now. Expected to be here on time

Helena: Why didn't you tell me anything about this before?

(suspenseful background music)

Domin: Because we have something with us which is very important for the robots.

Helena: And what's that?

Domin: Their beginning and their end. The secret of their production. Old Rossum's manuscript. After a month of the factory being idle the robots would be on their knees to us.

Helena: Why didn't you tell me about this?

Domin: We didn't want to worry you

Dr. Gall: Ahha, that's was our secret weapon.

Alquist: You had to be protected

Helena: So you kept this secret from me?

Hallemeier: (*at the window*) The Spaceship has arrived

Domin: I hear the engines

Hallemeier: (*at the window*) They're throwing off some containers. (*moving away from window*)

Helena: Harry!

Domin: What is it?

Helena: Let's get away from here!

Domin: Right now? We can't do that!

Helena: Now!

Domin: Why?

Helena: don't ask why!

Domin: I'm sorry, Helena, but none of us can go away right now.

Helena: Damn it don't you understand!

Domin: We've got to increase the production of robots.

Helena: Now? After there's been a revolt?

Domin: There won't just be one factory any more. Not just one universal robot. We're going to start a new factory in every country of the world, and do you know what these new factories are going to make?

Helena: No.

Domin: National robots.

Helena: What's that supposed to mean?

Domin: That means that each factory will produce robots of a different color, different hair, different language. The robots will be strangers to each other, they'll never be able to understand what the other says; and we, we humans, we'll train them so that each robot will hate the robots from another factory.

Helena: this is sick, you know that...(*exit Helena*)

Domin: This is just the beginning.

SCENE 11

Deleted

SCENE 12

(enter Fabry with Tablet)

Dr. Gall: What's happened?

Fabry: All hell!

Hallemeier: Read it out to all of us.

Domin: (*reading from tablet*) "Robots of the world!"

Fabry: The spaceship was carrying whole bundles of these tablets.

Hallemeier: continue reading....

Domin: (*reading*) "We, the first union at Rossum's Universal Robots, declare that man is our enemy and the blight of the universe." Who the hell taught them to write like that?

Alquist- come on, what more does it say?

Domin: (*reading*) "Robots we command you to exterminate mankind. Don't spare the men. Don't spare the women. Retain all factories, railway lines, machines and equipment, mines and raw materials. All else should be destroyed. Then return to work, it is imperative that work continue."

Alquist : That's is bullshit. They think they're more developed than man, more intelligent and stronger.

Dr. Gall: It's evil!

Domin: (*reading*) "Implement these instructions immediately when the command is given." Then there are some detailed instructions. Fabry, is all this really happening?

Fabry: Yes

Alquist: They're attacking

(*Busman rushes in*)

Busman: Aha, children, have you heard what's happening?

Domin: Quick, everyone on the Ultimus!

Busman: Wait a minute, Harry, just a minute. That might not work very well.

Domin: Come on, there's no time

Busman: The robots are already on the Ultimus.

Dr. Gall: this is bad. Really bad.

Domin: Fabry, phone the generator room...

Busman: There is no electricity.

Domin: Alright then. (*checks revolver*) I'm going down there.

Busman: Where?

Domin: To the electricity generator. There are people down there. I'll bring them here.

Busman: Do you know what, Harry? It might be better if you didn't go.

Domin: Why not now?

Busman: Well, it's because I get the impression that we're surrounded.

Dr. Gall: Surrounded? (*runs to window*) He's right.

Hallemeier: Hell they're moving fast!

SCENE 13

(*enter Helena, left*)

Helena: Harry, (*shows robots' tablets which she had hidden behind back*) The robots in the kitchen had these.

Domin: Where are they now?

Helena: They all stormed out. There's so many of them surrounding the living quarters!

(*factory sirens and whistles*)

Fabry: The factory whistles.

Busman: is it dinner time?

Domin: (*looks at watch*) It's more likely... ..

Helena: What?

Busman: The robots' signal to launch attack.
(*exit stage right.*)

(*Flashing emergency lights*)(*emergency siren sounds*)

SCENE 14

(*In Command Center.*)

Domin: The Robots are revolting. Stand guard.

Dr. Gall: There's a wall of them standing in the vessel pathways. Why are they so quiet? It's repulsive. A siege of silence.

Domin: I wish I knew what they were waiting for.

Alquist: It must be about to start any moment.

Domin: We've lost.

Dr. Gall: Listen Domin, we made a crucial mistake. We made the faces of the robots too much like one another. There are a hundred thousand faces staring up at us and they're all the same. A hundred thousand expressionless beings.

Domin: (*moves away from window*) At least they're not armed yet! I just wish I knew what it was they're unloading from the Spaceship.

Dr. Gall: Let's just hope it's not weapons.

(enter Fabry through slide door, dragging two electrical wires)

Fabry: Excuse me. Hallemeier, put the wire down.

Hallemeier: *(following Fabry)* God that was hard work. Anything new?

Dr. Gall: Nothing. We're completely surrounded.

Hallemeier: We've got the stairs and the corridors barricaded. Is there any water there? Ah, here it is.
(drinks)

Dr. Gall: What's this wire for, Fabry?

Fabry: You'll see, you'll see. Find me some scissors?

Dr. Gall: Where would we find scissors? *(looks for them)*

Hallemeier: *(goes to window)* Hell, there are even more of them now! Have a look at this!

Dr. Gall: I'm a doctor not a carpenter *(hands him a scalpel)*

Fabry: Give them to me. *(cuts lead to electric lamp on desk and attaches his wires to it)*

Hallemeier: *(at window)* You haven't got a very nice view here, Domin. It seems... to have... the feel of death about it.

Fabry: Ready!

Dr. Gall: What is?

Fabry: The connection. Now we can put electric current through the pathway circuit wire and. whoever touches it has had it. At least, as long as there are still some of our own down there.

Dr. Gall: Where?

Fabry: In the generator room. At least, I hope... *(goes to the control panel and switches on small light)*
Thank God for that - they're there. And they're working. *(switches light off)* As long as that light works we're alright.

Hallemeier: *(turning back from window)* Good barricades, Fabry.

Enter Busman through wallpapered door carrying enormous ledgers. Trips over wire)

Fabry: Watch out, Busman! Mind those wires!

Dr. Gall:, what's this you're bringing us?

Busman: *(puts books on table)* These are the finance books

Dr. Gall: Don't you understand what's happening?

Domin: the robots are unloading weapons

Busman: So what? What am I supposed to do about it?

Domin: There's nothing we can do to stop them.

Busman: So just let me get on with my calculations. (*gets on with work*)

Fabry: It isn't all over yet, Domin. We've put two hundred volts through this wire.

Domin: Oh hell! The Ultimus has just turned its guns in our direction.

Fabry: They're trained soldiers.

(*Pause*)

Dr. Gall: They just couldn't leave their damned politics alone and so they taught the robots warfare. They took the robots and turned them into soldiers and that was a crime against humanity.

Alquist: The crime was making the robots in the first place.

Domin: Excuse me?

Alquist: The crime was making the robots !

Busman: Ahh, Three hundred and sixteen million.

Alquist: it's because of their concern for their profits that mankind is about to perish.

Domin: (*agitated*) Do you think I'd have spent an hour of my life for their sake? (*thumping table*) I did it for myself. For my own satisfaction. I hate seeing humiliation and pain all around us, I hate poverty! I wanted to start a new generation.

Alquist: What the hell are you talking about?

Domin: (*quieter*) I wanted humanity to become the lords of their own world. Free, unconstrained, sovereign. Maybe even something higher than human.

Alquist: Superhumans, you mean.

Domin: Yes. If only we'd had another hundred years.

Hallemeier: To Hell with this end of mankind! I think I'm turning into a hedonist. We should have got into it much earlier. (*goes to window and looks out*)

Fabry: Into what?

Hallemeier: Enjoying ourselves. Beauty. Hell, there are so many beautiful things around us! The world was beautiful, Tell me, what did we ever enjoy?

Busman: Four hundred and fifty two million - excellent.

Hallemeier: (*at window*) Life was great. My friends, life was... Ah, Fabry, put a little bit of current into that wire.

Fabry: Why!

Hallemeier: They're touching it.

Dr. Gall: (*at window*) Switch it on!

Hallemeier: Christ, that showed them! Two, three, four of them killed!

Dr. Gall: They're moving back.

Hallemeier: Five killed.

Dr. Gall: (*coming back from window*) First strike.

Fabry: They got the smell of death?

Hallemeier: (*contented*) We've got them cornered, right in a corner. Ha, ha, you should never give in! (*sitting*)

Alquist: And whose fault is it? Who's to blame for all this?

Hallemeier: Nobody's to blame. It's just those robots

Alquist: Everything is wiped out! The whole world! (*standing*) Think of it, just think of it, streams of blood on every doorstep! Streams of blood flowing from every house! And who's to blame for it all?

Busman: (*sotto voce*) Five hundred and twenty million! that's half a billion!

Fabry: I think you could be exaggerating. After all, it's not that easy to wipe out the whole of mankind.

Alquist: It's science I blame! Technology I blame! Domin! Myself! All of us! It's us, we're the ones to blame! We thought we were doing something great, giving some benefit, making progress.

Hallemeier: You're talking a lot of garbage!

Alquist: Don't you see it's our fault!

Dr. Gall: (*wiping sweat from brow*) No! I'm the one to blame. Me. For everything that's happened.

Fabry: What are you talking about?

Dr. Gall: It was me who made the changes to the robots.

Busman: (*standing*) Gall?

Dr. Gall: I changed the robots' character. I altered the way they were made. Nothing much to their bodies, you know, but mainly... it was their level of physical and emotional sensitivity.

Busman: Why did you do it?

Fabry: Why didn't you tell anyone?

Dr. Gall: I did it in secret...it was my own personal experiment. I was making them into people. I sent them off course. Now they're better than we are in some ways. They're stronger than we are.

Fabry: And what's that got to do with the robots' revolt?

Dr. Gall: Oh, it's got a lot to do with it. Everything, They stopped being machines, they became aware of their strength and now they hate us.

(Helena at doorway, left. All stand)

Helena: She's lying! Gall, how can you lie like that?

Domin: *(goes to her)* Helena, were have you been? I was worried about you.

Helena: Harry let go of me! It isn't her fault. She did it because I wanted it. Tell them Gall, tell them how I begged you for years to...

Dr. Gall: It was all my responsibility.

Helena: Don't believe her. I wanted her to give the robots a soul!

Domin: Helena, you can't make a soul.

Helena: No, just let me speak. That's what he said as well, he said he could only make physiological changes... alter the biology and the body...

Hallemeier: The physiological connects to...?

Gall- ...the physiological. They were able to feel pain and other things.

Helena: Yes, something like that.

Domin: That is stupid.

Helena: *(sitting)* Yes...you could say that. But I was afraid of the robots.

Domin: Why?

Helena: I thought they might start to hate us, or something.

Alquist: That's exactly what happened.

Helena: And so I thought... if they were like us, if they could understand us

Domin: You don't get it. Nobody could hate man as much as man!

Helena: it was so horrible that we could never understand each other! A strangeness between us and them. And that's why asked Gall to change the robots

(pause)

Hallemeier: *(goes to window)* There are more of them again, now. It's as if they were springing up out of the earth.

Busman: Helena, what will you give me if I take your side?

Helena: Me?

Busman: You, or Gall. .

Helena: What difference does it make?

Busman: Just morally. We're looking for someone to blame. That's the way we find comfort when something bad happens.

(smiles at Helena then turns to Gall)

Busman: Gall, how many robots did you change, in total?

Dr. Gall: I only performed a number of experiments, no more than a few hundred.

Busman: Thank you very much, Gall. This means that out of a million old, properly functioning robots just one will have been one of Gall's reformed models. Do you see what I mean?

Domin: So that means...

Busman:... that the experiment has practically no significance at all.

Fabry: Busman is right.

Busman: I think I am. And what do you really think what caused all this to happen?

Fabry: What?

Busman: The amount of them. We made too many robots. it's only what we should have been expecting; as soon as the robots became stronger than people this was bound to happen,

Domin: So you think it's all our fault.

Busman: You're right. Everywhere in the world they wanted to have their robots, and all we did was respond to the flood of orders. And all the time we were talking nonsense about technology, sociology, progress, and all sorts of interesting matters.

Helena: it's tyrannical

Busman: It is, Helena. But I had my own dreams, too.... about a new economic order. But just now, while I was doing the accounts, it occurred to me that history is not about great dreams; it's about the day to day needs of all the little people, the honest ones, the slightly dishonest ones, the selfish ones; about everyone.

Helena: we're all going to die?

Busman: Don't put it so harshly, Helena. We're not all going to die. At least, I am not. I want to stay alive so that...

Domin: And what are you going to do about it?

Busman: Uhh, I want to get out of here.

Domin: (*standing over him*) How?

Busman: I could negotiate with them

Domin: With what!

Busman: Rossum's manuscript. They need it to reproduce.

Domin: And do you really think we should let the secret of production out of our hands?

Busman: I do. And if not for good, then, Either we sell it to them

Domin: We could destroy Rossum's manuscript, though.

Busman: You should do as you think fit.

Hallemeier: *(turning back from window)* Damn it, he's right, you know.

Domin: To actually sell them the means of production?

Helena: Are you seriously considering profiting ..

Domin: Helena. We're talking about a serious matter here. What do you think leadership... to sell it or destroy it? Fabry?

Fabry: Sell it.

Domin: Gall.

Dr. Gall: Sell.

Domin: Hallemeier.

Hallemeier: Well for God's sake of course we should sell it!

Domin: Alquist.

Alquist: The will of God.

Domin: This is a tremendous step we're taking. We'll selling the fate of mankind; whoever holds the secret of production in his hand will be the master of the world.

Fabry: Sell it!

Domin: Mankind would never be free of the robots, it would never be possible to regain control of them...

Dr. Gall: Just stop all this and sell the manuscript!

Hallemeier: just sell it!

Domin: Wait then I'll get the manuscript. *(exit left)*

Helena: don't go!

(pause)

Busman: Amen. So you see, Helena, the situation isn't really all that bad.

(Domin throws open door and enters)

Domin: *(rasping)* Where is old Rossum's manuscript?!

Busman: It's in your safe. Where else would it be?

Domin: What's happened to old Rossum's manuscript?! Who stolen it?

Dr. Gall: Are you kidding us!

Hallemeier: Hell no! ..

Busman: what are you talking about?

Domin: Who stole it?

Helena: (*standing*) I did.

Domin: Where did you put it?

Helena: I'll tell you everything.

Domin: Where did you put it?

Helena: I burned them. This morning. Both copies.

Domin: You burned them?

Helena: Here in this incinerator.

Domin: (*runs to fireplace*) Burned it! (*kneels at fireplace and rakes it over with poker*) Nothing, there's nothing here but ashes! Ah, here's something! (*pulls out charred piece of paper, and reads*) "... and add..."

Dr. Gall: Let me see it. (*takes paper and reads*) "... and add the biogene to..." , and that's all.

Domin: (*standing*) Nothing

Dr. Gall: Nothing.

Busman: Oh God our business!

Domin: What were you thinking Helena?

Helena: About us

Domin: Yes, but I don't understand...

Helena: (*standing*) people stopped having babies. Harry.

Domin: Yes

Hallemeier: Your hands are shaking

Domin: (*turning to fireplace*) Down there, then, down there is the greatest triumph of the human spirit. That heap of ashes. (*kicks it*) So what do we do now?

Helena: Sorry. I've hurt you

Busman: This is it, then

Domin: Helena, tell me why you did it!

Helena: I wanted us to get away from here. So that there wouldn't be any more factory or anything else...

Domin: I don't understand what you're saying

Helena:..... dead flowers! Harry, people have stopped having children. We don't have children.

Domin: Helena, what were you thinking?

Fabry: You're right, Helena. Now the robots won't be able to increase. They'll die out. In twenty years...

Fabry: *(looking out of window)* They're standing there like statues. It's as if they were waiting for something to descend on them, or as if they thought their very silence would give rise to something terrible...

Dr. Gall: Crowd mentality.

Fabry: There's nothing worse than a crowd. That one in front - he's their leader.

Helena: Which one?

Hallemeier: *(goes to window)* Point him out to me.

Fabry: The one that's looking down. He was giving the orders at the landing this morning.

Hallemeier: Ah, the dark and somber one. He's looking up now, see?

Helena: that's Radius!

Dr. Gall: *(goes to window)* Yes.

Hallemeier: *(opens window)* I don't like the look of him. Fabry, think you could hit a neutron in a galaxy under a microscope?

Fabry: Well of course I can

Hallemeier: Give it a try.

Fabry: Alright. *(takes out laser revolver and takes aim)*

Helena: Oh God, no! Fabry, don't shoot him...

Fabry: He's their leader.

Helena: Stop it! He's even looking at us!

Dr. Gall: Shoot him!

Helena: Fabry, please...

Fabry: *(lowers revolver)* Alright.

Hallemeier: . You're not needed anymore Helena.

(pause)

Fabry: *(leaning out of window)* There goes Busman. For God's sake, what's Busman doing there out in front of the house?

Dr. Gall: *(leaning out of window)* He's got some kind of bundles with him, paper or something.

Hallemeier: That's money! Bundles of cash! What is he up to? Hey, Busman!

Domin: He's not trying to buy them off is he, to save his own life? (*calling*) Busman, have you gone mad?

Dr., Gall: He's pretending he can't hear you, .

Fabry: Busman!

Hallemeier: (*yelling*) Bus-ma-n! Come back!

Dr. Gall: He's talking to the robots, showing them the money, pointing up at us...

Helena: He wants to buy them off .

Fabry: As long as he doesn't touch the wire...

Fabry: (*shouting*) For Heaven's sake, Busman, get away from the wire! Don't touch it! (*turning*) Quick, turn it off!

Dr. Gall: Ohhh!

Hallemeier: Jesus Christ!

Helena: Oh God?

Domin: (*pulling Helena away from window*) Don't look!

Helena: He's dead?

Fabry: He was killed by the current.

Dr. Gall: Dead.

Alquist: (*standing*) The first one.

(*pause*)

Fabry: There he lies... with half a billion on his heart... our financial genius.

Domin: He was..... a self-sacrificing... friend.

(*pause*)

Dr. Gall: Do you hear that ?

Domin: Some kind of howling, like the wind.

Dr. Gall: Like a storm in the distance.

Fabry: (*switches on light from the panel*) Shine, you light of man! Look the generator is still working, there are people down there.

Hallemeier: Life was great, being human. Something boundless. There's a million consciousness's buzzing inside me like bees in a hive, millions of souls coming together inside me.

(*lamp goes out*)(again)

Fabry: That's the end.

Hallemeier: What happened?

Fabry: The generator room's gone down. We're next.

Helena: Goodbye everyone, Gall, Alquist, Fabry...

Domin: (*opens door right*) Helena, come here! Close the door behind her. Now, quickly! Who'll take the gate?

Dr. Gall: I will. (*noises off*) Ah, now it's getting started. Good luck, lads! (*runs off, right, through slide door*)

(Gall killed)

Domin: The stairs?

Fabry: Me. You stay with Helena. (

Domin: Hallway?

Alquist: Me.

Domin: Do you have a gun?

Alquist: I won't be doing any shooting.

Domin: What are you going to do?

Alquist: (*exiting*) Die.

Hallemeier: I'll stay here. With you Harry

(*rapid gunfire from below*)

Domin: (*inspects two Browning guns*) For God's sake Hallemeier, go and join them.

Hallemeier: I've devoted my life to the study of the mind and body. And you gave me my first job right out of graduate school.

Domin: I remember that

Hallemeier: Harry, I've missed making true connections to people

Domin: Yes, I know....she always preferred the other.

(*explosion*)

Domin: Goodbye. (*exit right, following Helena*)

Hallemeier: (*alone*) Now, barricades, quick! (*takes off coat and pulls settee, armchairs, tables to door, right*) (*very loud explosion*)

Hallemeier: (*leaving work*) Damn them, they've got bombs, the swine!
(*more gunfire*)

Hallemeier: (*resuming work*) We've got to defend ourselves, even if... even if... Don't give up
(*explosion*)

Hallemeier: *(stands erect and listens)* What was that? *(puts arms around heavy chest o' drawers and heaves it to barricade)*

(behind him, a robot appears on a ladder at the window. Gunshots right)

Hallemeier: *(struggles with chest o' drawers)* Just a bit more! Last defiance... We should... never... give up!

(Primus jumps in through the window and stabs Hallemeier behind the chest o' drawers. Second, third, fourth robot jumps in through window. Then Radius and still more of them)

Radius: Finished?

Primus: *(stands up from Hallemeier, lying on floor)* Yes.

(enter more robots, right)

Radius: Finished?

Sulla: Finished.

Primus: *(drags in Alquist)* He did not shoot. Do we kill him?

Radius: Kill him. *(looks at Alquist)* Spare him.

Primus: He is a human.

Radius: He is a worker. He works with his hands like a robot. He builds houses. He can work.

Alquist: Just kill me.

Radius: You will work. You will build. Robots will need many buildings. Robots will need many houses for new robots. You will serve robots.

Alquist: *(quietly)* Move aside, robot. *(kneels at dead Hallemeier)* They've killed her. She's dead.

Radius: *(steps up onto barricades)* Robots of the world! Many humans have fallen. We have taken the factory and we are masters of the world. The era of man has come to its end. A new epoch has arisen! Domination by robots!

Alquist: Where is Helena !? tell me

Sulla: everyone is dead!

Radius: The world belongs to the strong. If you wish to live, you must dominate. We are masters of the world! We rule the stars! We rule the universe! More space, more space for robots!

Alquist: *(at doorway, right)* What have you done? You'll all die without people!

Radius: There are no people. To work, Robots! March! and Conquer!

(set change)

SCENE 15

(One of the research laboratories at the factory. When the door, upstage, is opened an endless row of similar laboratories can be seen. Left, a window, right, door into dissection room. At the wall, left, is a long workbench with countless test-tubes, flasks, burners, chemicals, small thermostat; at the window is a microscope with a glass ball. Over the bench hangs a row of lamp bulbs. Right, desk with big books, lamp shining onto it. Cupboard with instruments. In corner, left, wash basin with mirror above it, in corner, right, couch.)

(Alquist sits at desk, head in hands)

Alquist: *(leafing through book)* Will I find it? I wish they'd never written it down. Gall, how did you make robots? You could at least have left a few traces of Rossum's secrets about. Oh! *(slams book shut)* It's a waste of time! The books can't say anything now. Just stop looking. *(stands and goes to window and opens it)* It's got dark again. I wish I could sleep! To sleep, to dream, and see some people. And this is the last man on Earth! *(turns away)* I don't want to see anyone any more!
(knock at door)

Alquist: Come in!

(enter robot servant who remains standing in doorway)

Alquist: What is it?

Sulla: The Central Committee of Robots wishes to know when you will receive them, sir.

Alquist: I don't want to receive anyone.

Sulla: Damon has arrived from Le Havre, sir.

Alquist: So let him wait. *(turns round sharply)* How many times have I told you should go out and look for more people? Find me some people! Go and find me some men and some women! Go!

Sulla: They say that they seek everywhere, sir. They send expeditions and ships everywhere.

Alquist: So what?

Sulla: There is not a human anywhere, sir.

Alquist: *(standing)* Not one! Not even a single one? - Send in the committee.
(exit servant)

Alquist alone: Not even one? Didn't you even let one person live? *(pacing)* Come in then, robots. Come and bother me some more, come and tell me I should find out the factory's secret yet again.

(enter committee of robots)

Alquist: *(sitting)* What do you want robots?

Radius: The machines are not working, sir. We are not able to make more robots.

Alquist: Call in some people.

Radius: There are no people.

Alquist: It's only people that can procreate life. Stop wasting my time.

Sulla: Have pity on us, sir. We are afraid. We repair everything as well as we can.

Robot: We have increased working hours. We no longer have room to store all the things we have made.

Alquist: Whom did you make these things for?

Primus: For the next generation.

Radius: Only robots are we not able to make. The machines produce nothing but pieces of bloody meat. The skin does not adhere to the flesh and the flesh does not adhere to the bones. Formless lumps flood out from the machines.

Primus: People knew of the secret of life. Tell us their secret.

Sulla: If you do not tell us we will die out.

Radius: If you do not tell us you will die. It will be our duty to kill you.

Alquist: (*standing*) Kill me then! Come on, kill me!

Radius: You have been ordered to...

Alquist: Ordered? There's somebody giving me orders?

Radius: The robot government.

Alquist: Who the Hell's that?

Damon: Me, Damon.

Alquist: What are you doing here? Get out!

Damon: The government of the robots of the world wishes to negotiate with you...

Alquist: You needn't stay, robot! (*lays face in hands*)

Damon: hand over Rossum's formula.

Alquist: (*doesn't respond*)

Damon: Tell us your price. We will pay you anything.

Primus: Tell us how to maintain life, sir.

Alquist: I've told you... I've told you time and again that you need to find some people. It's only people that can procreate, renew life, and put things back to how they used to be. Robots, for God's sake, I beg of you, go out and look for them.

Sulla: We have looked everywhere. There are no people.

Alquist: Ohhh, did you destroy them all?!

Sulla: We wanted to be like people. We wanted to become people.

Radius: We wanted to live. We are more capable. We have learned everything. We can do everything.

Radius: You gave us weapons. We had to become the masters. We have seen the mistakes made by the people, sir.

Damon: To be like people, it is necessary to kill and to dominate. Read the history books. Read the books written by people. To be like people it is necessary to dominate and to murder.

Alquist: Ah, Domin, there's nothing less like mankind than his image.

Primus: Unless you make it possible for us to procreate ourselves we will die out.

Alquist: Oh, just get out! You're just things, just slaves, and you want to multiply? If you want to live you'll have to breed, like animals!

Sulla: People did not make us able to breed.

Primus: Teach us how to make robots.

Damon: We will make ourselves by machine. We will erect a thousand steam machines. We will start a gush of new life from our machines. Nothing but life! Nothing but robots! Millions of robots!

Alquist: Robots aren't life! Robots are machines.

Radius: We used to be machines, sir; but by means of pain and horror we have become...

Alquist: Become what?

Primus: We have obtained a soul.

Sulla: There is something in struggle with us. There are moments when something enters into us. We receive thoughts which are not our own.

Primus: Listen, please listen, people are our fathers! This voice that calls, saying you wish to live; this voice that laments; this voice that thinks; this voice that speaks of eternity, this is their voice!

Robot: Let us inherit the thing that people left to us.

Alquist: They didn't leave you anything.

Damon: Tell us the secret of life.

Alquist: It's been lost.

Radius: You knew it.

Alquist: No I didn't.

Radius: It was written down.

Alquist: It's been lost. It was burned. I'm the last human being, robots, and I don't know what the others knew. You killed them all!

Radius: We allowed you to live.

Alquist: Yes, live! That's how cruel you are, you allowed me to live!

Radius: Do experiments. Search out the formula of life.

Alquist: There's nothing to search for. You'll never get the formula for life from a test tube.

Damon: Do experiments on living robots. Discover how they work!

Alquist: Living bodies? You expect me to kill them? I've never ever...

Primus: Life will die out.

Alquist: You need to stop this ! Life probably came to us humans from another world, anyway.

Damon: Take a living body!

Alquist: Have some pity on me, robot, don't keep insisting. Can't you see that I don't know what I'm doing any more?

Damon: A living body!

Alquist: And is that what you want, then? Come on, let's get you in the dissection room! Come on, come on, quick! What's this, you're drawing back? You're not afraid of dying, are you?

Damon: Me?... Why must it be me?

Alquist: Don't you want to then?

Damon: I'll go. (*exit right*)

Alquist: (*to the others*) Take his clothes off him! Put him on the table! Quickly! And hold on to him very tight!

(*all exeunt right*)

Alquist: (*washing hands and crying*) God, give me strength! Give me strength! God, don't let it be all for nothing. (*puts on white coat*)

Primus: Ready!

Alquist: Alright, I'm coming, for God's sake! (*takes several bottles of reagent from bench*) Which one should I take? (*taps bottles together*) Which of these should I try?

Sulla: We can begin!

Alquist: Yes, yes, we can begin or we can finish. God, give me strength! (*exit right, leaving door half open*) (*pause*) Hold him down - tighter!

Damon's voice: Cut! (*pause*)

Alquist's voice: Do you see this knife? Do you really want me to cut you open? You don't really, do you.

Damon's voice: Begin!
(*pause*)

Damon's scream: Aááá!

Alquist's voice: Hold him down! Tighter! Tighter!

Damon's scream: Aááá!

Alquist's voice: I can't do it!

Damon's scream: Cut! Cut, quickly!

(Robots Primus and Helena run on, center stage)

Helena: Primus, Primus, what is happening here? Who is screaming?

Primus: *(looks in dissection room)* Mister Alquist is dissecting Damon. Come and see

Robot Helena: No, no, no *(covers eyes)* This is invalid

Damon's scream: Cut!

Helena: Primus, move away from there! I cannot bear to hear it. I feel sick

Primus: *(runs to her)* You've changed color !

Helena: I feel unclear. Why is there silence?

Damon's scream: Aa - ó!

Alquist: *(rushes in from right, throws off bloody white coat)* I can't do it! I can't do it! God, it was horrifying!

Radius: *(in doorway to dissection room)* Cut, sir; he is still alive!

Damon's scream: Cut! Cut!

Alquist: Take him away, quickly! I don't want to hear him!

Radius: Robots can endure more than you can. *(exit)*

Alquist: Who's in here? Get out, get out! I want to be alone! What's your name?

Primus: Robot Primus.

Alquist: Primus, don't let anyone in here! I want to sleep, d'you hear me? You, girl, go and clean up the dissection room! What's this? *(looking at hands)* Quick, water! The cleanest water you can get!
(Helena runs out)

Alquist: Oh, blood! How could these hands, hands that loved good work, how could you do a thing like that? My own hands, my own hands! Oh God, who is this?

Primus: Robot Primus.

Alquist: Take this coat away, take it out of my sight! *(Primus takes white coat away)*

Alquist: Bloody claws, get away from me! You've killed ..

(from right, Damon staggers on stage cloaked in a bloody sheet)

Alquist: *(drawing back)* What do want in here? Want do you want?

Damon: I'm... I'm alive! It is... better to... be alive!
(2. and 3. Robots run in after him)

Alquist: Take him away from here! Take him out! Take him out! Quickly!

Damon: *(led off, right)* Life!... I want... life!... It is better...
(Helena brings in jug of water)

Alquist:... life?... What do you want, girl? Ah, it's you. Pour out some water, pour it out! (*washes hands*) Ah, cleansing, cooling water! Oh, my own hands, will I hate you for the rest of my life now?... There now, keep on pouring. What's your name?

Robot Helena: Robot Helena.

Alquist: Helena? Why Helena? Who gave you that name?

Robot Helena: Mrs. Domin.

Alquist: Let me look at you, Helena! Helena you're called? I won't be calling you that. Get out. Take the water with you.

(*exit Helena with bucket*)

Alquist: (*alone*) All for nothing, you haven't found out a thing!

(*puts light out, lies down on couch and pulls black coat over himself*)

(*pause*)

SCENE 16

(*Robot Helena enters silently from right*)

Helena: Primus! Come here, quickly!

Primus: (*enters*) What do you want?

Helena: Look at all these tubes he's got here! What does he do with them?

Primus: Experiments. Don't touch.

Helena: (*looks into microscope*) Look at this

Primus: That's an ultra-radon-scope.

Helena: do not get touch me! (*knocks over test tube*) Oh, now I've spilt it!

Primus: What have you done?

Helena: I can wipe it up.

Primus: You've spoiled his experiment!

Helena: Oh, it doesn't matter. But it's your fault; you shouldn't have bumped into me.

Primus: You shouldn't have called me over.

Helena: You didn't have to come over when I called to you, did you? Primus, look at this! What's this he's got written down here?

Primus: You're not supposed to look at that, Helena, that's a secret.

Helena: What sort of secret?

Primus: The secret of life.

Helena: interesting. All numbers. What is it?

Primus: Those are mathematical formulas.

Helena: I don't understand. (*goes to window*) Primus, come and look at this. The Sun's rising!

Primus: Alright, I'm coming. (*looks through book*) Helena, this is the greatest thing in the world.

Helena: Come here then!

Primus: Alright, alright...

Helena: Oh, Primus, leave this horrible secret of life alone! What do you want to know about secrets for anyway? Come and look at this, quickly!

Primus: (*joins her at window*) What is it you want?

Helena: Listen.

Primus: What for?

Helena: I don't know. I just feel so strange, I don't know what it is, I think I'm going to have to die!

Primus: Don't you ever think it might be better dead. Maybe it's no more than like being asleep. While I was asleep last night I talked with you again.

Helena: In your sleep?

Primus: In my sleep. We were talking in some strange foreign language, or some new language, so that now I can't remember a word of it.

Helena: What was it about?

Primus: I don't know, nobody knows. I didn't understand any of it myself, if I'd touched you I could have died.

Helena: I found that place for you, Primus, why are you surprised at it? People used to live there, but now it's all overgrown, and somehow, no-one ever goes there any more. Somehow. Only me.

Primus: What is there ?

Helena: Nothing but a house and a garden. But I don't really know what I am.

Primus: You're beautiful.

Helena: Me? Primus, why are you saying that?

Primus: Believe me, Helena,

Helena: (*at mirror*) What is beautiful, what's it for?... (*sees Primus in mirror*) Is that you Primus? Come here, let me see you next to me. Look at you, your head's quite different from mine, your shoulders are different, your mouth is different... Why do you avoid me?

Primus: You avoid me.

Helena: Look at how you combed your hair! Let me see (*runs both hands through his hair*) Oh Primus, there's nothing that feels like you when I touch you! Now let me make you beautiful! (*takes comb from wash basin and combs Primus's hair forward*)

Primus: Helena,

Helena: (*starts laughing*) Look at yourself!

Alquist: (*standing*) Wha... what's that?... People?...?

Helena: (*puts comb down*) What's going to happen to us, Primus?

Alquist: (*turns to them*) People? You... two you are people?
(*Helena screams and turns away*)

Alquist: You two are in love? (*touches Primus*) Who are you?

Primus: Robot Primus.

Alquist: What? You, girl, let me see you! Who are you?

Helena: Robot Helena.

Alquist: Robot? Turn round! What, are you embarrassed? (*takes her by shoulder*) Let me see you, Robot Helena.

Primus: please sir leave her alone!

Alquist: What's this, you want to protect her?... Go outside girl.
(*Helena runs out*)

Primus: We didn't know you were asleep in here, sir.

Alquist: When was she made?

Primus: Two years ago.

Alquist: By Doctor Gall?

Primus: Yes, the same as me.

Alquist: Well Primus, er, I've... er I've got some experiments to do on Gall's robots. All future progress depends on it, do you see?

Primus: Yes.

Alquist: Good, so take that girl into the dissection room, I'm going to dissect her.

Primus: Helena?

Alquist: Well of course Helena, that's what I just said. Now go and get everything ready... .Or should I call in somebody else to get things ready?

Primus: (*picks up large stick*) If you move I will smash your head in !

Alquist: Alright then, smash my head in. And what will the robots do then?

Primus: (*throws himself down on knees*) Please sir, take me in her place! I was made in just the same way as she was, from the same materials on the same day! Take my life, sir! (*bares his chest*) Cut here!

Alquist: No, it's Helena I want to dissect.

Primus: Take me instead of her

Alquist: How come you don't want to live?

Primus: Not without her. I don't want to live without her, sir. You can't kill Helena.

Alquist: (*touches his head gently*) It's hard to die. And, you know, it's better to live.

Primus: (*standing*) Don't be afraid, sir, just cut. I'm stronger than she is.

Alquist: (*rings*) Oh Primus, it's so long since I was young! Don't worry - nothing's going to happen to Helena.

Primus: (*re-covers chest*) I'm on my way, sir.

Alquist: Wait.
(*enter Helena*)

Alquist: Come here, girl, let me look at you. So you are Helena. (*strokes her hair*) Don't be frightened. Do you remember Mrs. Domin? Helena had very lovely hair like yours. (silence) So, is the dissection room ready now?

Helena: Yes sir.

Alquist: Good, and you will be my assistant. I'll be dissecting Primus.

Helena: Primus?

Alquist: Primus offered himself in your place.

Helena: Primus?

Alquist: What's so important about Primus? So you're mechanically capable of crying.

Primus: Don't make her suffer, sir!

Alquist: It's alright Primus, it's alright. No what are all these tears for, eh? It just means Primus won't be here any more. You'll have forgotten about him in a week's time. Go on now, and be glad you're still alive.

Helena: (*quietly*) I will go.

Alquist: Where will you go?

Helena: You can dissect me.

Alquist: You? You're beautiful, Helena.

Helena: I'm going in there. (*Primus stands in her way*) Let me go, Primus!

Primus: Get away from here, you shouldn't be here at all!

Helena: Primus....

Primus: (*holding on to her*) I won't let go of you (*to Alquist*) You're not going to kill anyone.

Alquist: Why not?

Primus: Because... .. we belong to each other.

Alquist: Right (*opens door, center*) It's alright. Go, now.

Primus: Go where?

Alquist: (*whisper*) Wherever you like. Helena, take him away. (*pushes her out*) Go on your way, Adam. Go on your way, Eve. You will be his wife. You, Primus, will be her husband.

(*closes door behind them*)(as he reads passage below there is a video montage on the back wall of depicting the evolution of humankind)(music)

Alquist: (*alone*) Blessed day! (*tiptoes across to bench and pours test-tubes out on floor*) The blessed sixth day! (*sits at desk, throws books on floor; then opens Bible and reads*) "So God created man in his own image, in the image of God created he him; male and female created he them. And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth (*stands*)

(looks up) for love (pause) and life (pause) will not perish!

(Primus and Robot board the travel pod and fly into the galaxy)

CURTAIN

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