

Treatment and Synopsis for *Clockwork Child*

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Historical Background

In the middle of the 19th century two English mathematicians, Charles Babbage and Ada Lovelace, needed to secure funding to create a powerful calculating machine. If successful, their computer would be built one-hundred years before the first computer was actually invented.

The way to secure the funding was simple: Babbage had created a prototype which was reviewed by scientist Luigi Menabrea, and published in French. To officially introduce Babbage's machine in England, Ada translated Menabrea's paper. In the process of translation, she doubled its original length with mathematics and notes of her own.

What started as a simple translation project, blossomed into a treatise on the capabilities of the machine, with additional diagrams, figurative examples, and the world's first *computer program* to run on the as-yet realized machine, called the *Analytical Engine*.

Ada's paper popularized the Engine, and elevated her own status as female scientist. Ada had been a scientist since she was young: endeavoring to create a flying machine, and marveling those around her with determination and a keen scientific mind. With the publication of these notes, Ada's introduction to the serious scientific community was ideal, and the future for the Analytical Engine looked more possible than ever.

After the landmark work, Ada never published a scientific or mathematical paper again, and Babbage broke their partnership, and shortly thereafter abandoned his Engine. The two rarely spoke until weeks before Ada's death when she called Babbage to her side one last time.

Though Ada didn't achieve success in her life, she has become a symbol of female achievement in science, with March 24th being declared *Ada Lovelace Day* by the blogosphere¹. The Department of Defense created a programming language after her, *Ada*, and since 1998, the British Computer Society has awarded a medal in her name and initiated an annual competition for women students of computer science.²

Ada Lovelace is the protagonist of this piece, and rightly so. Her life was full of promise and controversy during an exciting historical time where mechanical engineering's potential could solve any problem.

¹TechnoPhobia. Finding Ada. 2010. <<http://findingada.com/>>.

² British Computer Society. About the Medal. 2010. <<http://www.bcs.org/server.php?show=nav.7305>>.

Synopsis

Note: When Ada loses consciousness the first time, she moves backwards to the pivotal moments in either her path as a scientist, or the creation of their *son* (the paper and Analytical Engine). The problem comes when Ada moves backwards, she becomes everyone but herself, and she has to try and deter her own unstoppable, unflappable younger self.

The play opens with Ada Lovelace on her deathbed. She had been struggling with cervical cancer for years, but these are her final moments. She is talking to Babbage about their son, and he is trying to make her last moments as comfortable as possible. Ada wants to see her son. If she can do that, then she will take the medicine that will make her transition from life to death more peaceful.

Babbage reveals that their son is dead, making it impossible to ever see him again. Ada blames Babbage, promising that if she could go back, she would have destroyed everything that they created together, and the failed scientist that she became. She loses consciousness, and Babbage calls in her orderlies to help her.

Children and parenting are the underlying metaphor used for the translation of science and the ownership of ideas. The Analytical Engine is their clockwork child, and the birth of that child is what Ada tries to prevent in the first part of the play, and protect the child after its birth becomes unavoidable.

Ada travels back to her childhood, and becomes her tutor, actively trying to deter her own passion in mathematics and the sciences. She gets moved forward in time, and discovers that she is her mother, forbidding the study of particular sciences.

Ada then becomes a man in the drawing room where she originally met Charles Babbage, then becomes Babbage himself, changing tactics and actively trying to make the Analytical Engine, Ada's child. She remains Babbage, and sees what herself was like at that point in time, finally having to break her own heart and makes the steps to dissolve their partnership.

Finally, she is able to become herself and ends her relationship with Babbage, giving him sole custody of their Engine. The last scene takes place as she hovers close to death, she finally meets her and Babbage's son, the physical manifestation of their work: their Clockwork Child. She is finally able to greet him, whole and perfect, before she slips-off to death.

Cast Breakdown

In its current form, the cast needs can be met with four actors:

Ada Lovelace..... The protagonist who travels through time.

Charles Babbage..... Is played by the same actor no matter the time-difference.

Female Chorus..... Plays Ada's Nurse, Young Ada, Ada's Mother, and other smaller parts.

Male Chorus..... Play's Ada's Tutor, Ada's Clockwork Child, and other smaller parts.

Themes of the Play

Clockwork Child follows Ada's life as a potential scientist, culminating with the creation of their only collaborative scientific project and its subsequent collapse of their relationship. Using that story as the physical framework for the piece, the play explores the ownership of ideas, as well as exposing the disparity of scientific advancement and opportunity between the sexes.

The audience will probably be aware that the quest to change a younger Ada is a hopeless one. What is seen is the acceptance of the death of a collaborative project: Ada and Babbage's *child*. We are watching a scientist coming to terms with the death of her prized idea, and in so doing finds success in her own strength.

Though Charles Babbage did the initial mathematics and plans of the Analytical Engine, he didn't see it as going past rote computation. Ada took his idea, and expanded it outward towards the different possibilities explained above. She not only expanded the possibilities, but she wrote the notes in a way which created parallel images in the minds of the Victorian readers:

*We may say most aptly that the Analytical Engine weaves algebraical patterns just as the Jacquard loom weaves flowers and leaves.*³

Both mathematicians were an intricate part of the design, planning, and marketing of the Analytical Engine, but where the two met loggerheads was in the engine's execution. Who would have the final say in its outcome? The man who laid the groundwork for it, or the woman who brought it 'to life' and

³ Menabrea, Luigi Federico. "Sketch of the Analytical Engine Invented by Charles Babbage". Scientific Memoirs 3. With notes upon the Memoir by the Translator. 1843

made it possible? This question echoes in all collaboration processes done, whether it is in the arts of engineering, or the creation of a play: who is the true owner of the work?

If the engine had been created, it would not only have propelled England, Babbage, and Lovelace, but the careers of all female scientists in Victorian England.

The definition for women at that time vacillated from weak-bodied, to weak-minded. Women's weak bodies were either unequipped to deal with their fast and creative minds, or they were entirely uncreative, but could do rote problem-solving with great skill: passionate but incapable of any creative act.⁴

The creation of the Analytical Engine would have displayed a woman who is both a creative visionary and a capable problem-solver: a clear paradigm shift.

It is these two concepts themes which the play rests itself on: the true owner of an idea after its creators have ceased collaborating, and the struggle and subsequent triumph of a woman in a male-oriented scientific environment.

⁴ Winter, Alison. "A Calculus of Suffering: Ada Lovelace and the Bodily Constraints on Women's Knowledge in Early Victorian England". *Science Incarnate: Historical Embodiments of Natural Knowledge*. 1998.

Structure and Concept

The Analytical Engine was a machine which could add or subtract multiple series' of numbers together to get either a larger or smaller number. Though this may seem like a simple concept, it is the foundation of computation, with the eventual outcome of the super computers which currently elevate our culture.

Each digit of a number in the engine was a separate wheel, which would rotate, changing from 0-9. Imagine a simple bike or suitcase lock, but with fifty digits instead of four. Powered by steam, the Analytical Engine would add or subtract numbers until the problem assigned to it was solved. If the Engine couldn't express large enough numbers to solve its assigned problem, one of two things would happen: the machine would start again from the beginning, or cease to work. The play is the last moment of Ada Lovelace; an engine, trying to struggle on, but becoming aware that it is falling apart.

As a writer and audience member, I find that strength comes more so from specifics than generalities. Having two characters argue over the ownership of an idea is interesting, but without something solid to ground it in reality, the audience cannot go on the complete journey: they may go on the intellectual journey, but not the visceral one.

It would appear that the physical manifestation of the ownership of an idea can be found by an argument over the Analytical Engine. While the Engine is a physical object, it is still extremely nebulous: the Engine translates into almost directly into Science, which almost immediately puts an audience at arms-distance.

The solution for this problem, *the physical manifestation of the ownership of ideas*, comes in a commonplace relationship which can be mined to great effect: parenthood. Ada and Babbage both create a child, the paper, which will grow and become the Analytical Engine. Both know what the best thing for their child is, and both will fight to the death to give their child the chance to be grown. But what happens when both parents know exactly what is best for their child?

Alignment to the *Collider Project's* Mission

Clockwork Child, though taking place in the Victorian Era, will not be a play where you have to read the Dramaturgs' Note to understand. History is used as the backdrop for this piece to enable a discussion about intellectual property and gender perspective.

It is the *person* of the scientist that this play focuses on, and I believe that focus on the *person* will showcase the magnitude of scientific advancement greater than a presentation of contrasting scientific ideas ever would.

Copenhagen was astounding because of its grounding in the human aspects of science, *Logicomix*⁵ struck the same deliberate cord. By following the struggles and triumphs of people of accomplishment, we understand the greatness that is in ourselves. That understanding is the purpose of experiencing theater.

⁵ *Logicomix* is slightly more obscure than *Copenhagen*, so I thought an explanation might be in order. *Logicomix* is a graphic novel which focuses on the life of mathematician and philosopher Bertrand Russell. One of the underpinnings of the book is the focus not on the achievement of the mathematicians, but on the human struggle. It is in following the human struggle, the book argues, that achievement can truly shine. I agree.