
Doctor Atomic

Monster Opera?

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Preface

During my research, I have used a DVD of the 2007 performance of *De Nederlandse Opera* of *Doctor Atomic* in combination with the score of the 2005 premiere, because the 2007 score or a 2005 recording were not available to me. There were some changes made mainly to the choir passage during the overture and to Kitty Oppenheimer's vocal part, but I do not believe these were problematic for my inquiry. Furthermore, I have chosen to limit myself to English language reviews of performances of *Doctor Atomic*; the reviews were written in response to different performances. The staging was radically changed for the performance at *The Met* in 2008, and this time directed by Penny Woolcock. Nevertheless, the musical aspects of *Doctor Atomic* are central to the reviews discussed, and musical revisions were again minor. I have used the article 'The Emperor's New Opera: John Adams' *Doctor Atomic* and the Future of Classical Music' by Robert Fink¹ as my starting point for this reception study. A more thorough study of the reception of the opera could be made in the future, also including Dutch reviews. Citations are taken from the original texts verbatim, and may therefore include possible inconsistencies in their spelling.

Introduction

The opera *Doctor Atomic* (2005) by John Adams and Peter Sellars deals with, in Adams' words, 'the great mythological tale of our time', namely the events leading up to, and including, the first atomic bomb explosion in the history of mankind on the 16th of July, 1945, at the Trinity test site in the New Mexico desert.² The opera seems to cross the border between mythology and history in a rather intriguing way. The not uncontroversial libretto by Peter Sellars is comprised of pre-existing material ranging from poetry by Charles Baudelaire and Muriel Rukeyser, to extracts from the *Bhagavad Gita*, scientific literature, secret documents, and recollections of people somehow involved in the Trinity events involving conversations between the protagonists.³ Not only does the opera cross the boundary between accepted historical fact and the domain of fiction, it seemingly also transgresses the divide between high and low culture. Adams titled the opera *Doctor Atomic* because he wanted 'something that had more of a populist ring to it', and thought it 'resonated with science fiction and the American middlebrow impression of scientific geniuses.'⁴ In an interview

¹ Robert Fink, "The Emperor's New Opera: John Adams' *Doctor Atomic* and the Future of Classical Music" in the thus far unpublished *Oxford Handbook of Opera*, http://ucla.academia.edu/RobertFink/Papers/162731/The_Emerors_New_Opera_John_Adamss_Doctor_Ato_mic_and_the_Future_of_Classical_Music, accessed on 6-4-2011.

² John Adams, *Hallelujah Junction* (New York: Farrar, Straus and Giroux, 2008), 273.

³ Originally Adams and Sellars envisaged a collaboration with Alice Goodman, who also wrote the libretti for *Nixon in China* and *The Death of Klinghoffer*. Critical reception of the opera overall was positive, but the libretto mostly was lamented by the same critics. See Robert Fink's article mentioned above.

⁴ John Adams, *Hallelujah Junction*, 276.

taken by Thomas May in February 2005, Adams was asked ‘what was the first musical impulse [he] had for the opera’, and responded that he first thought about science fiction films of ‘the late ‘40s and early ‘50s, and finally decided to work with the idea of using ‘Varèse and science-fiction music’ as a starting point. In the interview, he sketched a typical plot, featuring ‘a nuclear explosion in the desert [... which] would result in some disturbing phenomenon, something frightening and threatening.’⁵ In another interview Adams stated: ‘I did want to give somewhat of the feel that this story and these characters had risen to the level of popular culture. So there are moments when the music [conveys] that frisson of 1950s sci-fi movies. [...] I want to present it [...] with a sense of grace and accessibility.’⁶ How this source of inspiration finally crystallised into actual music, does not become clear in the interviews. Nevertheless, when hearing the opera, perhaps it is not difficult to imagine hearing the reverberations of the sounds of science fiction. For me, this is reason to look deeper into the score to assess whether there is a connection.

A striking aspect of *Doctor Atomic* is its high degree of dissonance, in comparison with many earlier Adams compositions. This dissonance is perceived in different ways in critical reviews of the work’s performances. Some heard ‘sounds and noises that are reminiscent of the *musique concrete* of Varese’ and ‘lyrical outbursts [including] the rhythms of Stravinsky, the orchestral brawn of Wagner, and the finish and colors of Ravel’⁷ or felt the music ‘weds a cool Stravinskian precision and rhythmic vitality with a kind of seething Wagnerian dread. Rapid caffeinated figures dart around the orchestra like hyperactive electrons.’⁸ Others felt the music indeed owes something to science fiction: ‘Skittish instrumental lines come close to sounding like riffs from a serialist score. [...] You hear evocations of sci-fi film scores and bursts of Verèsian frenzy.’⁹ ‘Many of these sounds are familiar from the forbidding archives of modern music past, not to mention a hundred sci-fi movies. There’s a sense in “Doctor Atomic” that Adams is mobilizing the entire ghoulish army of twentieth-century styles.’¹⁰

Does *Doctor Atomic* actually refer to science fiction, and if, which science fiction, and how? My hypothesis is that *Doctor Atomic* indeed is meant to refer to a kind of ‘50s science fiction films. To be more precise, I believe *Doctor Atomic* refers to the genre of nuclear monster films, in which a monster angered by a nuclear test threatens civilisation. Secondly, I believe it is certainly possible for a spectator familiar with this type of films to perceive the references made in *Doctor Atomic*. What elements facilitate this connection? Is it just the music? This, I believe, would be hard to argue. While

⁵ Thomas May, “John Adams on *Doctor Atomic*” in *The John Adams Reader*, ed. Thomas May (New Jersey: Amadeus Press, 2006), 225-6.

⁶ Mark Wilson, “*Doctor Atomic* to Premier in San Francisco” in *Physics Today*, September 2005.

⁷ Marilyn Tucker, “*Doctor Atomic* by John Adams” in *American Record Guide*, January/February 2006.

⁸ Jeremy Eichler, “An opera that hovers on threshold of the nuclear age” in *The Boston Globe*, 16 October 2008.

⁹ Anthony Tommasini, “Countdown to the Eve of Destruction” in *The New York Times*, 3 October 2005.

¹⁰ Alex Ross, “Countdown” in *The New Yorker*, 3 October 2005.

of course there exist certain musical clichés in the genre discussed, the music of '50s science fiction depends on a pre-existing musical tradition. What makes it science fiction film music is the fact that it is used in a film. The use of these aforementioned clichés certainly underlines the connection, but the plot has an important part in this association. In the opera, the explosion in the desert does not bring forth terrible monsters, but there do seem to be certain mythological forces at work.

The online Oxford Dictionary defines 'myth' as 'a traditional story, especially one concerning the early history of a people or explaining a natural or social phenomenon, and typically involving supernatural beings or events.'¹¹ While *Doctor Atomic* and the science fiction films discussed here are generally not concerned with the origins of our culture or species, they tend to mystify twentieth century technological developments, and fantasize on their consequences for the future. In this, it functions as a parable concerning the possibilities, responsibilities, threats and progresses emanating from this modern technology. In 1984 Jacques Derrida argued that, while nuclear arsenals were certainly knowable and existent, the scenario of a nuclear war only 'has existence through what is said of it', and because it is in a way unknowable, 'a fable, then, a pure invention: in the sense in which it is said that a myth, an image, a fiction, a utopia, a rhetorical figure, a fantasy, a phantasm, are inventions.'¹² From this perspective, the atomic bomb and its implications form an ideal basis for a modern mythology, and through this mythological component, for nuclear arms criticism. As with much of '50s science fiction, *Doctor Atomic* seems to express a distrust of nuclear weaponry. In the spring of 2009, an article by Mitchell Cohen appeared in *Dissent Magazine*, condemning the opera as 'reactionary'. According to Cohen, it is reactionary because it imposes an aged 1960s 'experience' on a subject to which its relation is 'imaginary'. *Doctor Atomic's* mode of critique is one that demands not to 'touch the natural order of things', and therefore a conservative one, Cohen says.¹³ Whether his critique is deserved or not, a critical message can be read, and was read, in *Doctor Atomic*.

In this thesis, I will examine how Adams and Sellars described the mythological dimension of *Doctor Atomic*, and how this dimension is connected to nuclear arms criticism. I will discuss the type of science fiction film I think *Doctor Atomic* refers to, and will compare the 2007 performance of *De Nederlandse Opera* with a number of these films. For this, I have chosen three science fiction films in the nuclear monster genre, namely *The Beast from 20,000 Fathoms* (directed by Eugene Lourie, 1953), *Godzilla* (the original Japanese title is *Gojira*. Directed by Ishirô Honda, 1954) and *Them!* (directed by Gordon Douglas, 1954). I have chosen these films because of their popularity, and their influence on future films in the genre. I will discuss these films in terms of their music, plot

¹¹ "Myth" in *The Oxford Dictionary Online*, http://oxforddictionaries.com/view/entry/m_en_gb0545790#m_en_gb0545790, accessed on 7-4-2011.

¹² Jacques Derrida, "No Apocalypse, Not Now (Full Speed Ahead, Seven Missiles, Seven Missives)", translated by Catherine Porter and Philip Lewis, in *Diacritics*, Vol. 14, No. 2, summer 1984, 23.

¹³ Mitchell Cohen, "The Damnation of Doctor Atomic" in *Dissent Magazine*, spring 2009, 79-81.

characteristics, resemblance to mythology and nuclear arms criticism. Subsequently, I will compare these elements to general aspects of *Doctor Atomic*, and will examine a few selected scenes that show resemblance to the music of the aforementioned films.

Doctor Atomic, as do many other Adams works, contains references to different styles of music, and uses these to convey musical meaning. For example, the duet 'Am I in your light' arguably refers to a Debussyesque style, in order to set an intimate atmosphere. One may find parts in the opera suggesting a connection with Benjamin Britten's *War Requiem*. Needless to say, I do not want to imply *Doctor Atomic* refers only to science fiction, but reference to it is used in order to create a certain atmosphere.

The Faust connection

The idea for an opera on J. Robert Oppenheimer came from Pamela Rosenberg, the then general director of the San Francisco opera. She envisioned an opera about an 'American Faust', and thought Adams was the composer suited for the job. Adams and his long-time collaborator Peter Sellars had previous experience with operas dealing with twentieth century historical subjects. Their collaboration had led to the acclaimed *Nixon in China* (1987) and the controversial *The Death of Klinghoffer* (1991). Rosenberg suggested that Oppenheimer's role in the development of the first atomic bomb had a 'latter day "pact with the Devil" implication. Oppenheimer's eventual fall from political grace and public humiliation mirrored the Faust myth.¹⁴ Adams and Sellars originally planned the happenings in the opera to span from the conception of the bomb, to Oppenheimer's fall from grace eight years later at the hand of Edward Teller. Eventually, a shorter timespan proved to be more workable.¹⁵ This change of plans was not just made out of practical considerations. Adams argued in retrospect that the Faust analogy was not particularly apt, because the scientists working on the bomb probably felt immense pressure to outpace the Germans who, according to American intelligence, were working on a similar project. Adams pleads that 'there was no reason not to believe that their efforts were anything other than patriotic and devoted to saving civilization as they knew it.'¹⁶ The opera would be more about the scientists' struggle with the moral implications of the project.

But still, the idea that Oppenheimer's struggle should be presented in a kind of mythological way was there to stay. 'There was something about the unlocking of these forces [contained by the nucleus] by human intellectual effort that was ripe for a mythic treatment. The manipulation of the atom [...] was *the* great mythological tale of our time [...] beyond all, it was a parable about ecology

¹⁴ John Adams, *Hallelujah Junction*, 271.

¹⁵ *Ibid.*, 275-6, Thomas May, "John Adams on *Doctor Atomic*", 219.

¹⁶ John Adams, *Hallelujah Junction*, 275.

[...] would we succumb like one of those vainglorious Greek or Norse gods, overcome by our imagined sense of power and unable to measure its destructive potential until it was too late to pull back from the brink?’¹⁷ Adams argued that, like with *Nixon in China* and *The Death of Klinghoffer*, the subject was in a way archetypal, able to ‘summon up in a few choice symbols the collective psyche of our time.’¹⁸ ‘The story, compelling and even romantic from the start, became even more iconic over time, especially when the main characters and their personal narratives became public.’ Shortly after the war, Oppenheimer gained status as a ‘virtual media star, second only to Einstein in the public’s image of the “genius” scientist.’¹⁹

Not only Adams considered the mythological treatment viable. Sellars saw it too, and connected it to a moral stance in an interview taken for the occasion of the 2007 work’s performance in the Netherlands: ‘[...] we could not show Hiroshima [or Nagasaki] on stage [...] because art has its limitations, like science. And nothing we can do as artists equals the scope and the horror, and what Samuel Beckett called “the unspeakable of our century” as well. And so, John and I have chosen [...] essentially a 24 hour period into the first atomic bomb test, with the audience knowing subsequently there will be Hiroshima. In this case, very much like the Greek dramatists, it’s helpful to take a mythological subject that the audience already knows. They already know what happens later in the story, so it becomes interesting to watch the steps leading up to the conclusion that the audience already recognizes.’

Although the opera is based on historical events, and much emphasis is placed on the use of actual historical documents in its libretto, we must not forget that, for example, poetry and religious texts were also used. Adams pleads that, especially in the case of Oppenheimer, poetry would be a good way to give him more personal depth. ‘[H]e and his wife had little coded signals to each other that were based on Baudelaire lines or some such text. When he was a seventeen-year-old undergraduate at Harvard, he and his roommates would have sonnet writing contests. So it’s appropriate, and no stretch of the imagination, that in this opera Oppenheimer would express his deepest thoughts in great poetry.’²⁰ But regardless of the characters’ familiarity and affinity with the poetry in question, it does not reflect their actual thoughts and feelings during the real proceedings. While not directly mythological, it adds a layer of fiction. However, there is more. On the evening of the test, a thunderstorm breaks out. While this actually happened at the night of the real test, so much stress is placed on this storm and its threatening nature, that it seems like earth’s warning against the events that will follow. Some of the scientists fear the possibility that the explosion will ignite the earth’s atmosphere, which was actually disproved long before the real test. Pasqualita and

¹⁷ Ibid., 273-274.

¹⁸ Thomas May, “John Adams on *Doctor Atomic*”, 235.

¹⁹ John Adams, *Hallelujah Junction*, 269.

²⁰ Thomas May, “John Adams on *Doctor Atomic*”, 223-224.

Kitty Oppenheimer seem to represent a kind of otherworldliness, and function as the work's consciousness. Pasqualita evokes a Tewa religious setting through her text, and Kitty's ominous 'Easter Eve 1945' (after a Muriel Rukeyser poem) gives us a glimpse of the world to come. This is not just reminiscent of *das ewig Weibliche* of the Faust legend (for which Adams himself argues)²¹, but also evokes a certain earth-motherly notion, similar to the Greek myths of Rhea and Gaia. The conflict of conscience is raised to a conflict between nature and technology. Direct reference to existing mythology is made through an apocalyptic chorus on an extract of the *Bhagavad Gita*.

Nuclear arms criticism

Adams does not consider his music to be centred on political or moral criticism, despite of the subjects of his operas made in collaboration with Sellars. 'It's going to take another few decades for the whole "CNN opera" reference to be laid finally to rest. It's a pain in the butt, but its cuteness will eventually have no meaning. Nor do I like it when people use the term "political", as in "Mr. Adams is fond of political themes for his stage works."' 'I'm not interested in lecturing my audience, teaching a social parable in the manner of a Brecht *Lehrstück*.'²² While Adams certainly is aware of the moral conflict involving the atom bomb, he does not explicitly speak about a critical agenda. He does however speak about a more abstract ecological conflict, and the scientists' moral dilemma, as noted in the paragraph above.

In an interview in *Bulletin of the Atomic Scientists* Sellars echoes the same sentiment: 'We live in an age where everything is so heavily propagandized and organized to convince you of something and to make you buy something. So that's one thing as an artist I'm proud not to do. Around 4,000 people will leave the performance with 4,000 different experiences and that's so wonderful. My job is not to tell you what to think, it's just to make you think. [...] What you must think, is up to you.'²³ An expression of moral neutrality through a politically charged statement is suspect, especially when it comes from Sellars, occupying a position as lecturer at UCLA lecturing about 'Art as a Moral Action'.²⁴ In the 2007 interview discussed above, he expressed a strongly critical opinion: '[...] not one nuclear weapon is a good thing. [...] That they exist in the world is already a danger to everyone. They must all be eliminated [...] So, to once again bring up the atomic topic, to put it on people's minds [...] nobody goes around talking about the atomic menace. Everybody is just happily shopping, and nobody really thinks about it.'²⁵

²¹ John Adams, *Hallelujah Junction*, 285.

²² Thomas May, "John Adams on *Doctor Atomic*", 229, 235.

²³ "The Bulletin Interview: Peter Sellars" in *Bulletin of the Atomic Scientists* Vol. 64 No. 1, March/April 2008, 15.

²⁴ Since 2007. I could not confirm whether he still occupies the post at UCLA.

²⁵ "Interview with Peter Sellars" on *John Adams: Doctor Atomic. DVD. Directed by Peter Sellars. 2008; The Netherlands: Opus Arte, 2008.*

There are many aspects of *Doctor Atomic* which one might interpret as aimed towards nuclear arms criticism. Oppenheimer's conversion from his initial refusal to hear other scientists' objections to an attack on Japan, to awareness of the moral implications of his actions, is central to the opera. The bomb hanging over a baby's crib in 'Rain over Sangre de Cristos' seems to symbolise a threatening loss of innocence. And the explosion itself is not depicted neutrally at all: the sound of shrieking babies during the actual explosion precludes any sense of objectiveness. After the explosion a woman can be heard asking in Japanese for water, and her lost husband. The lines spoken by her were supposedly spoken by actual Hiroshima survivors shortly after the impact.²⁶

Contemporary music

In his autobiography, Adams expresses dissatisfaction with much of twentieth century music. He is especially referring to twentieth century music as practised by Pierre Boulez, Milton Babbitt or Karlheinz Stockhausen, according to Adams composers with 'a posture of dispassionate scientific investigation as their operative model.'²⁷ He describes his own maturing as a composer as a conflicting process, having felt at loss with what he saw as the lack of potential for expressivity in modernist compositional techniques, atonal techniques in particular. 'The expressive potential [of tonal harmony] was obvious. But tonality [...] made possible musical statements that were both varied and unified. [...] atonality, rather than enriching the expressive palette of the composer, in fact just did the opposite.' 'But atonality, [...] rather than being the Promised Land so confidently predicted by Schoenberg, Boulez, and Babbitt, proved to be nothing of the kind.'²⁸ But at the same time, as a composer he seems to have felt obliged to take these musical developments seriously. 'Boulez, however, caused me endless cognitive dissonance because he was an indisputably expert musician, [...] who possessed the intellectual powers to stake out and defend his positions.' He even once wrote a letter to Leonard Bernstein to chide him for the sentimentality of his *Chichester Psalms* in order to vent his own frustrations over the contemporary musical developments, writing, 'What about Boulez?'²⁹

After a long time of experimenting with different methods of composition, from a piano quintet to Cage-inspired electronic music created by splicing tapes, feeling that he 'had not found a voice [...] on which to build a musical language',³⁰ he composed *Phrygian Gates* in 1977, inspired by Terry Riley's *in C* and music by Philip Glass and Steve Reich. While Adams' style quickly evolved

²⁶ John Adams, *Hallelujah Junction*, 291.

²⁷ *Ibid.*, 31.

²⁸ *Ibid.*, 104, 106-7.

²⁹ *Ibid.*, 31-2.

³⁰ *Ibid.*, 87.

beyond minimalism's ethos of simplicity and repetition, its workings permeate famous later works ranging from *Nixon in China* to *On the Transmigration of Souls* (2002).

As noted in the introduction, many critics noted *Doctor Atomic*'s modernist feel. Perhaps to Adams the story of the creation of a terrible weapon by scientific reasoning was best expressed by using serialist-like music. In *Hallelujah Junction*, he talks about how he experiences Webern's music, and that of composers inspired by it: 'The music of Webern, presented to me in the classroom as paradigm of modern sensibility, was unique, original, personal. But expressively it made me feel tight and constricted, its defining characteristic an emotional parsimony that, when taken up by later practitioners of that style, was most of the time bleak and unfeeling.'³¹

Science fiction film music has a tradition of the use of modernist techniques, as University of Texas PhD candidate Lisa M. Schmidt argues. '[A]vant-garde musical tropes [such as atonal techniques and synthesized or electronic sounds] were adopted to represent an incommensurable idea: that which is non-human, alien or monstrous.'³² As noted in the introduction, it is not possible to see science fiction film music as entirely separate from pre-existing musical genres. But in the context of *Doctor Atomic*, it also becomes difficult to do the opposite. References to twentieth century music can just as well be interpreted as references to science fiction. Herein lies a possible danger to my hypothesis. However, later on I will establish a direct link between the music of *Doctor Atomic* and the three discussed films.

'50s Science Fiction as a popular mythology

As stated in the introduction, Adams said he sought inspiration in a type of '40s and '50s science fiction films featuring a typical plot starting with an explosion in the desert with terrible consequences. In the '40s there already existed a tradition of monster films that walked the thin line between science fiction and horror, such as *Dr. Jekyll and Mr. Hyde* (directed by Victor Fleming, 1941), and there were films in which mad scientists experimented with nuclear rays to do terrible things, such as *Doctor Cyclops* (directed by Ernest B. Schoedsack, 1940). *The Day the Earth Stood Still* (directed by Robert Wise, 1951), certainly contained strong nuclear arms criticism. In this film a man from outer space, Klaatu, is sent to earth with a robot companion to negotiate with the world powers about nuclear disarmament. By his reasoning, earth's nuclear arsenal forms a threat to life on other planets. If mankind does not comply with his employer's demands for total disarmament, it will face total annihilation.

³¹ Ibid., 104-5.

³² Lisa M. Schmidt, "A Popular Avant-Garde: The Paradoxical Tradition of Electronic and Atonal Sounds in Sci-Fi Music Scoring" in *Sounds of the Future: Essays on Music in Science Fiction Film* ed. Mathew J. Bartkowiak (North Carolina: McFarland & Company, Inc. Publishers, 2010), 38.

But these films barely resemble the type of film described by Adams. The first film in the heavily clichéd nuclear monster genre was *The Beast from 20,000 Fathoms* (from here on referred to as *Beast*). In this film, an atomic test on Antarctica awakens a frozen dinosaur (a fictional *Rhedosaurus*), which consequently sets course for New York to return to its prehistoric nesting grounds. A scientist involved in the arctic nuclear test, professor Tom Nesbitt (Paul Hubschmid), sees the monster, but is not believed when he tries to warn his peers. With the help of a fellow witness, he finally convinces palaeontologist Thurgood Elson (Cecil Kellaway) of the monster's existence. Elson is mostly concerned with studying the monster in order to learn its secrets, while Nesbitt, assisted by the beautiful female doctor Lee Hunter (Paula Raymond), sees its potential danger and advocates to destroy it. Elson perishes in an attempt to make contact with the monster. When the monster finally reaches New York through the Atlantic current, the army attempts to destroy it, but is confronted by a deadly prehistoric disease carried in its blood. The monster is finally defeated after shooting it with a bullet containing a rare radio isotope and setting it on fire, simultaneously destroying the disease.

This typical plot, a deserted location with a nuclear explosion, nature taking revenge in the form of an angered or mutated monster of some kind, alarmed and/or curious scientists accompanied by their beautiful female assistants, and natural hindrances seemingly preventing the monster's destruction, was mirrored many times. Perhaps the most iconic example is the Japanese film *Godzilla*. It is the first instalment in a series of 28 films, of which the last was released in 2004. It tells about a mythological dinosaur-like monster living under sea, angered and possibly mutated by nuclear radiation due to American nuclear bomb testing, and wreaking havoc by setting Tokyo on fire. The film starts with a scene depicting a fishing boat witnessing a distant nuclear explosion, after which some of the fishermen fall ill. In the film, natural balance is upset by the nuclear explosion, leading to nature avenging itself in the form of the monster *Godzilla*. The fishing boat episode is analogous to the *Lucky Dragon* incident in March 1954, where an actual Japanese fishing boat was accidentally exposed to fallout from a thermonuclear bomb test on Bikini Atoll, leading to the sickness of several of the crew members, and the death of one of them six months later. In the film, of course, there is a scientist, Dr. Yamane (Takashi Shimura), who wants the monster preserved in order to study it. The monster proves immune to conventional weapons, and finally a colleague, Dr. Serizawa (Akihiko Hirata) helps by sacrificing himself and using his invention, an 'oxygen destroyer', to stop *Godzilla*. In the end, Dr. Yamane expresses his concern that further nuclear experiments will bring forth more monsters like *Godzilla*: 'I don't think that was the only *Godzilla*. If they keep experimenting with deadly weapons another *Godzilla* may appear somewhere in the world.'

Them! does not start with an actual explosion, but this time actually use the New Mexico desert as its locus. The film's story plays a few years after the Trinity test. Its fallout led to the mutation of common ants into gigantic and ferocious monsters. The military appeals to three

scientists, of course one of them a beautiful female assistant, to help and stop the pending apocalypse brought on by the ants. After destroying the anthill in the desert, they discover that a few queens hatched and escaped to lay their eggs elsewhere. One of the queens settles itself in the sewers of Los Angeles. In the end, the army saves the day, but with a warning against the consequences of nuclear testing, as with *Godzilla*. Responding to two soldiers expressing the concern for the results of these tests, doctor Medford (Edmund Gwenn) concludes: 'When man entered the atomic age, he opened a door into a new world. What we'll eventually find in that new world, nobody can predict.'

There are many more examples of monster films from the '50s concerned with one form or another of nuclear arms criticism. While the films discussed do not all start with an explosion in literally a desert, I do think they fit Adams' description of the type of science fiction film he refers to. *Doctor Atomic* does not deal with the bomb in a metaphorical way, using a monster, but it deals with the actual bomb, and it does offer a critical perspective. As previously argued, it does have mythological aspects. Apart from their fear of Nazi Germany beating them to the clock, the scientists are motivated by a certain curiosity. Some of them are concerned with the moral implications of creating a weapon of such great potency, or are even afraid of the possibility that the earth's atmosphere will ignite due to the test's explosion, with apocalyptic results. Perhaps *Doctor Atomic's* monsters live in the imagination of the scientists. While the science fiction films talk in metaphors about the myth of the creation of nuclear weapons, the opera deals with what perhaps is the *ur-myth*.

The sound track of the '50s monster film

Here I will consider the components that constitute the sound tracks of the films I selected for consideration, and will describe some exemplary scenes. I will examine musical orchestration, style, tonal structure, and the role of sound effects. There certainly are similarities between these films, but this does not mean that every aspect under consideration here will appear in all three films.

Like most contemporaneous films, the music of *Beast*, *Godzilla* and *Them!* is scored for symphonic orchestra, in which the strings and brass sections play a prominent role. The music is mostly non-diegetic, as is the case in all the examples discussed here. Strings are used in multiple contexts, for example, to underline sentimentality in a scene. But these films typically include one or more scenes in which it is obvious something terrible is about to happen. In these scenes, the strings are typically used to express a sense of premonition, or anxiety. In *Beast*, a group of scientists watching through binoculars waits for the explosion to commence, which at the same time is a sign of their experiments' success and the awakening of the Rhedosaurus. The scene is accompanied by

the strings section, first playing a sequence of consonant chords placed on a low drone in the bass, progressively becoming more dissonant. When the countdown starts, the instrumentalists start to play with tremolo. In *Them!*, the protagonists descend into the ants' nest in the desert in order to destroy the colony. The scene depicting their entrance and descent into the nest is accompanied by the string section, playing dissonant tremolo figures. Other instruments play short dissonant figures in a way reminiscent of perhaps Webern's six orchestral pieces op. 6. A celesta is added, radiating an eerie atmosphere. In scenes where direct threat is apparent, for instance, when the film's featured monster is satisfying its appetite for destruction, the brass section typically becomes prominent. In the scene where *Godzilla* enters Tokyo in order to set it on fire, a threatening fragmentary modal melody, reminiscent of the *Dies Irae* hymn, played by the brass section and punctuated by a pounding timpani and piano is heard. In *Beast*, the monster's attack on the city is accompanied by the complete orchestra, but with conspicuous and dissonant brass figures.

In all these films, dissonance plays an important role, especially in scenes depicting frightening situations. Dissonance is not attained through the use of strict procedures, as for example chromatic saturation or dodecaphonic theory, but through a more arbitrary use of dissonant intervals or tone clusters. Additionally, *Them!* and *Godzilla* both make gratuitous use of irregular rhythmic structures. *Godzilla's* pentatonic main theme, recurring throughout the film at moments of the monster's appearance, alternates between 4/4 and 5/4 time. In *Them!*, for instance, there is a scene in which a little girl, not talking because of the trauma she suffered in the desert, is confronted with the smell of formic acid by the scientists assisting the police. She panics, at which the police and the team of scientists travel to the desert in order to look for proof for their hypothesis. Hurried and rhythmically irregular music is scored to an orchestra including a percussively used piano, resembling perhaps Stravinsky's *Le Sacre du Printemps*.

In both *Godzilla* and *Them!* sound effects are used in ominous or fearful scenes. In the scene of *Godzilla's* first appearance, its victims-to-be are first awakened by the sound of a raging storm, until they become aware of a loud pounding sound, and panic. The monster becomes an acoustic threat by using a pounding drum-like sound for its gigantic feet threading the ground. This pounding sometimes fuses itself with the musical fabric, as in the scene depicting the destruction of Tokyo. Here, the pounding is not synchronous with the monster's movements. It is depicted in the musical space rather than being diegetic, and this time through a combination of the piano and timpani. In *Them!*, the vicinity of the monstrous ants becomes apparent to both the viewer and the characters in the film though the high-pitched sound they make, which supposedly is a form of communication.

Science fiction film music in *Doctor Atomic*

Musically, *Doctor Atomic* shares some of the general aspects discussed above. Of course, it is scored for symphony orchestra, expanded with assorted percussion instruments, a celesta and a computer controlled sound system. The computer controlled sound system is used to play back diverse sound effects and passages of *musique concrète* prescribed in the score.

Overture

The opera starts with a *musique concrète*-like sound collage. On the DVD of the 2007 performance of *De Nederlandse Opera* (directed by Peter Sellars), the collage is visually accompanied with vivid and unflattering war imagery. This sound collage is suddenly interrupted by a loud and dissonant sound cluster in the brass section. More sound clusters in different sections of the orchestra follow, while distorting the metre by accentuating seemingly random parts of the beat. The timpani add to this irregular and unpredictable rhythmic structure, while the metre changes between 3/4, 4/4, 2/4 and even 5/4. A loudly played minor ninth interval is to be heard in the brass section and other parts of the orchestra. After that follows a choral setting of an abstract from Henry DeWolf Smyth's report 'Atomic Energy for Military Purposes'. It explains the workings of nuclear fission in pseudo-scientific terms.³³

Some of the elements identified in the previous chapter occur in the overture (such as dissonant tone clusters, the irregularly the pounding timpani, and ominous brass sounds of which the minor ninth leap is an example). The dissonance does not seem to be the result of dodecaphonic or other strict composition procedures. The procedure seems more arbitrary, like in the film music discussed earlier, and is aimed at the effect of shock or fear. The introductory sound collage (including among others the sound of a propeller airplane), while not directly referring to the three monster films, adds a cinematic touch to the whole.

Rain over Sangre de Cristos

The interlude 'Rain over Sangre de Cristos' depicts the Gadget (which was the code name for the Trinity bomb) hanging over the crib of seven year old Katherine Oppenheimer, with Kitty Oppenheimer and the Tewa maid Pasqualita waiting for the experiment to pass several miles away. The storm troubling the experiment continues relentlessly. A low orchestral drone in the brass and strings section is heard, supported by the recorded sound of rain and thunder. The orchestral passage builds up the tension in what sounds like a complex chromatic progression spiked with strong dissonance. The passage can in fact be reduced to a progression of occasionally overlapping

³³ The physics sung at the première were turned out to be incorrect. Adams changed the text and scoring to counter this problem in the version performed by *De Nederlandse Opera*.

chromatically shifting triads, starting with a B major chord, ending with a G sharp minor chord in bar 76. However, there is no real harmonic progression, and therefore the passage can hardly be regarded as tonal. Compare this passage to the scene from *Beast* in which professor Thurgood descends into the ocean, in order to study the Rhedosaurus. The orchestration and chord patterns are different, but similarly gradually shifting harmonic motion is heard.

In bar 76, a serialist sounding music is heard, played by the harp and a celesta. Katherine Oppenheimer awakens and starts to cry, at which Pasqualita starts to sing in order to lull her back to sleep:

*In the north the cloud-flower blossoms
The cloud-flower blossoms
And now the lightning flashes
And now the thunder clashes
And now the rain comes down!
Ah my little one,
my little one.*

Pasquelita's melody is almost completely written in aeolic G sharp minor, with the only non-modal note being one E sharp. The 'Ah' of the penultimate line is sung to a melisma spanning eight bars. Meanwhile, the chromatic passage returns once with both the harp and celesta, once without the harp. They are not literal reiterations, but nonetheless have a similar irregular rhythmic and intervallic structure. The passage is, on close inspection, serialist nor dodecaphonic. The pitches seem randomly ordered, except in the regard of their intervals. Dissonant intervals prevail, especially the major seventh and small second. However, in all three phrases, chromatic saturation is reached.

The bomb hanging over the crib during a tempest could be a metaphor for the threat of the loss of the innocence of science or humanity, or perhaps the threatening loss of innocent life. Pasqualita's modal melody and long melisma accentuates her otherness, and maybe also her being an oracular figure, as some kind of manifestation of Goethe's *ewig Weibliche*, as Adams argued. 'A lot of what Pasqualita sings verges on the incomprehensible – poetry by Muriel Rukeyser that has vague references to some tribal past, some prehistoric consciousness, with a hint of land being corrupted and a people being destroyed.'³⁴ The cloud-flower in the song invokes the image of the mushroom cloud of a nuclear explosion, and the tingling chromatic sounds of the harp and celesta floating on the uncertain rhythms of the wind could be its spores, its nuclear fallout. In fact, a similar celesta figure can be heard in scene three of act one, when captain James Nolan warns general Leslie Groves and Oppenheimer about the horrible consequences of nuclear radiation. In *Them!*, an eerie celesta passage is to be heard during the descent into the anthill in the New Mexico desert. Of

³⁴ Thomas May, "John Adams on *Doctor Atomic*", 228-9. John Adams, *Hallelujah Junction*, 286.

course, there are differences between this music and the atonal melody in 'Rain over Sangre de Cristos'. The *Them!* scene is rhythmically less complex, more repetitive, and has less chromatic inflections.

Batter my Heart

At the end of act one, a few hours before the test will commence, Oppenheimer finds himself alone with the nuclear device. While earlier regarding the soul as a worthless concept, and advocating attacks on Japan without warning, confronted with the device and its possible dangers he seems to reflect on his role in the project, and finds himself trapped in a moral dilemma. The exact nature of his dilemma is unclear; his feelings of doubt are expressed through the seventeenth century John Donne holy sonnet 'Batter my Heart'.

As noted by Adams himself, the aria 'Batter my Heart' is perhaps the most archaic part of the opera.³⁵ Dissonance and irregularity make way for clear melodic gestures in D minor. The orchestral introduction, also in D minor, contains Adams' trademark energetically pulsating rhythms and harmonic stasis. But even here a comparison can be drawn to science fiction. At the core of the orchestral introduction is a drone on the tonic in the stings, which suddenly leaps up and increases in volume. The gesture is accompanied by a figure of flutes, of which the highest and most conspicuous pitch is the scale's third, F. This element is elaborated by breaking up the drone in a pulsating and elaborated ostinato centred on D minor, using the same stuttering increases and decreases in volume. In *Beast*, the countdown to the test in the beginning of the film is accompanied by a similar gesture, this time in E minor. While the scientists look through their binoculars in anticipation of the explosion, the strings play a slow figure embellishing the pitch of G, with the lower parts of the strings section playing a drone on E and G. Here the minor third interval plays an important role, as in the 'Batter my Heart' orchestral passage. Suddenly, when footage of a plane flying to the site of an actual nuclear test is shown, the tension is increased by the suddenly louder strings playing a radiant and vibrating G.

Countdown Part I

Perhaps the most striking example of a film reference in *Doctor Atomic* is the first part of the countdown in act 2, scene 3. Oppenheimer and Groves have just been told they are not dealing with a normal storm, but an unpredictable tropical one. Their experiment still has a chance of success during a small time frame of an hour in the morning to come, when the weather will calm. In the scene that follows, the strings start to play a jagged chromatic motive in sixteenth notes with a neighbouring note embellishment. The brass section plays a percussive figure, accenting different

³⁵ John Adams, *Hallelujah Junction*, 285-6.

parts of the beat, and thus creating an irregular rhythmic structure. The choir sounds ominous shrieks, also in an irregular pattern. Then the brass mutes, and the strings temporarily interrupt their unnerving motion, sustaining the rhythmic irregularity initiated by the brass section. The timpani starts to pound in fragmented triplet figures, placing accents off the beat at random moments. The choir starts a descending six-note figure two bars long, followed by similar figures of different lengths.

During a scene in *Beast* professor Nesbitt falls ill after the monster's attack, and is transported to New York by airplane. The music in this scene sounds conspicuously similar to the 'Countdown Part I' fragment, as if the latter paraphrases the former. The *Beast* fragment contains a similar jagged string motif of sixteenth notes with a conspicuous neighbouring note embellishment. The brass section plays staccato contretemps figures, but here in a more predictable fashion than in *Doctor Atomic*. There is another, perhaps less obvious resemblance. A repeated long note sounds in the horns, and then is followed by a rising six note figure. Where the brass figure here has a glorious ring to it, the more chromatic and stretched vocal descent in *Doctor Atomic* has an opposite, perhaps terrifying effect.

Mixing and sound effects

There is another important aspect that adds to the *Doctor Atomic* experience. While this is not a first in Adams' work, *Doctor Atomic* makes use of elaborate sound mixing. The orchestral and vocal parts are meant to be electronically amplified, and surround sound mixing applied to especially the sound effects increases the audience's submergence in the music. Surround sound is of course especially reminiscent of the cinema, and is widely used in modern science fiction films. The films considered in this thesis do not use any of these types of sound mixing techniques, but monaural sound. While in *Doctor Atomic* the use of these surround effects does not add to the linkage of the work to '50s science fiction, it does link to the opera's filmic dimension, and attracts attention to the sound effects. Also, many sound effects are used, as for instance the thunder and rain effects in 'Rain over Sangre de Cristos'.

One of the effects in the opera, namely the bomb's explosion towards which the whole work is set, was created in a way similar to the roar of the monster *Godzilla*. Adams describes the conception of the explosion effect as follows: '[...] I chose to create an extended orchestral countdown, a panoply of clocks, some ticking, others pounding like pile drivers, each at its own tempo. Underneath the clock polyphony is a bone-rattling booming coming from loudspeakers that surround the audience. I made the sound from a sampled timpani roll, which I looped and processed with heavy resonant filtration. To this I added, at the peak moment, a cluster of recorded baby screams that shrieks across the physical space of the theatre like a sonic knife, slashing the darkness.' In 'Atomic

Overtones and Primitive Undertones', Shuhei Hosokawa cites and translates sound engineer Ichiro Minawa describing the process by which the roar was created: '[...] we decided to use musical instruments and we played the bass. But in order to efface the instrument-like sound, we loosened all the strings and played various parts of them. [...] We tried to record hundreds of sounds and selected the usable ones. Then we changed the speed of tape and added echo, and synthesised and processed them.'³⁶ The technological means by which the *Gojira* effects were created were much more primitive, but both are based on the idea of using a recorded instrumental sound and distorting it to create a sound effect.

Conclusion

In this thesis I have examined musical, mythical and nuclear-critical aspects of both *Doctor Atomic* and my selection of science fiction films. In the scenes of the opera I've examined, either stylistic elements occur which are also prominent in the science fiction film soundtracks discussed, or the musical material directly resembles that of a certain film scene. In some cases, especially those of 'Countdown Part I' and the orchestral introduction to 'Batter my Heart', it is not unthinkable that they were actually based on the film music in question. It is of course possible that there are other films that resemble certain scenes in *Doctor Atomic*. It is not only the musical material that can make one think of science fiction. Both the opera and films contain a mythological dimension. There are some differences in this respect between *Doctor Atomic* and the science fiction films that I examined. In *Doctor Atomic* the subject matter is treated in a more serious way: there is no need to use an unrealistic metaphor like a monster for either nuclear weaponry or the dangers and fears it brought into the world. But it still has a critical message as its core. A conflict between nature and technology, between spirituality and science without moral considerations can be seen in it.

Not only can those musical, mythological and critical aspects be read in the opera, but as we have seen, they were intentional. The association of *Doctor Atomic* with an emblem of fear of nuclear warfare in the form of science fiction serves to underline its actual subject matter: the moral dilemma faced by J. Robert Oppenheimer and his team of scientists, and the fear their creation was to inspire for many years to come. Adams said he did not want to lecture his audience. The libretto and staging were mainly Sellars' work, but Adams' contribution to the project, including the choice of referring to science fiction music, seems to make the nuclear arms criticism latent in *Doctor Atomic* all the more outspoken.

³⁶ Shuhei Hosokawa, "Atomic Overtones and Primitive Undertones: Akira Ifukube's Sound Design for *Godzilla*" in *Off the Planet: Music, Sound and Science Fiction Cinema* ed. Philip Hayward (Eastleigh: John Libbey Publishing, 2004), 48.

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