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An Eve of Construction

John Adams's *Doctor Atomic*

Linda C. Ferguson

“That I may rise and stand,
o’erthrow me, and bend
Your force to break, blow,
burn and make me new...”

John Donne (1572–1631)

Holy Sonnet No. 14

A SURPRISING AMOUNT OF MUSIC has been written about the atomic bomb. *Not* surprisingly, much of it has come from popular culture, often well positioned to respond quickly to current events. On 6 August 2005—the fiftieth anniversary of the bombing of Hiroshima, an audio-video anthology was released (“detonated” according to promotional materials) entitled *Atomic Platters: Cold War Music from the Golden Age of Homeland Security*. This set, published by Bear Family Records, contained Public Service announcements (some recorded by popular entertainers of the 1950s) and more than one hundred songs, including Slim Gaillard’s “Atomic Cocktail” (1945), Doris Day’s “Tic Tic Tic” (1949), The Commodores’ “Uranium” (1955), and Tom Lehrer’s “We’ll All Go Together When We Go” (1959). The DVD contained short subject anti-Communist and civil defense films, including the classic “Duck and Cover,” which extended bomb paranoia to a whole generation of school children in the mid-1950s.

“If the button is pushed,
there’s no runnin’ away
There’ll be no one to save,
with the world in a grave
...We’re on the eve of destruction.”

P. F. Sloan

sung by Barry McGuire (1965)

In October of that same anniversary year, 2005, American composer John Adams unleashed his *Doctor Atomic* at the San Francisco Opera. It was premiered in Europe by De Nederlandse Opera of Amsterdam in June 2007 and was staged at the Lyric Opera of Chicago in the 2007–2008 season. Both Amsterdam and Chicago offered the original Peter Sellers production. A new production was mounted by the New York Metropolitan Opera in the current (2008–2009) season and included in the Saturday broadcast series including HD delivery to participating movie theaters across the country. (The

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"I am among those who think that science has great beauty... A scientist in his laboratory is not only a technician: he is also a child placed before natural phenomena, which impress him like a fairytale. We should not allow it to be believed that all scientific progresses can be reduced to mechanisms, machines, gearings, even though such machinery also has its own beauty. Neither do I believe that the spirit of adventure runs any risk of disappearing in our world. If I see anything vital around me, it is precisely that spirit of adventure, which seems indestructible."

Marie Curie (1933)

impressions described in this essay are based on the Chicago Lyric production, the Metropolitan Opera broadcast, and some assorted clips available on YouTube from the Netherlands Opera.) In this work, historical narrative is similar to but more compelling than science fiction. And science becomes the matter of art.

Adams was not the first classical composer to take on the bomb. At the Brussels Exposition in 1958, Edgard Varèse displayed his *Poème électronique*, an electronic tape composition of 480 seconds which exploded the notion that performers were necessary. Varèse was not the first to compose music onto magnetic tape, a means by which composers could speak directly to listeners by manipulating sounds embedded in physical matter instead of writing printed directions for performers to realize. But the *Poème*, played through 350 speakers mounted in the Philips Pavilion designed by Le Corbusier to house the composition, was the first deliberate mass delivery of electronic music to a large general audience. The structure, a tent-like creation with multiple white peaks, focused more on process and audience experience than on exterior effect. As audience members progressed through the multi-media structure, the sounds and projected visual images expressed new realities about life in the mid-twentieth century. The visual images juxtaposed the ancient with the modern, natural elements with works of human conception, the abstract and the particular, the trivial and the elevated, youth and the aged. Prominent among the images were mushroom clouds. And Varèse's closing audible gesture is easy enough to associate with the same... followed by an immense silence.

In the early 1980s, minimalist composer Steve Reich, inspired by the poetry of William Carlos Williams and by the New Mexican desert home of the Manhattan Project, created *The Desert Music*, a large cantata in five parts for chorus and orchestra. It treats the issues of nuclear warfare and of individual attentiveness, response, and responsibility. Lines selected from Williams's "The Orchestra" (1954) ask "Well, shall we think or listen? Is there a sound addressed not wholly to the ear?" Reich's orchestration is huge, rich in winds and percussion. Inspired by a siren in real life, a call to action more urgent to current day ears than the traditional bugle call, Reich replicated one in the viola parts. Both Varèse's *Poème*, and Adams's *Doctor Atomic* employed actual sirens.

Adams's opera in two acts is set in New Mexico in the summer of 1945. Act One depicts many aspects of technical and mental preparation, including consideration of science's relationship to politics, ethics, and social justice; Act Two focuses on the countdown. Act One, Scene One opens in the Manhattan Project laboratory in Los Alamos on a June day. Scene Two moves to the Oppenheimer's home that night, or some night in that same month. Scene Three shifts to the test site ("Trinity") at Alamogordo on 15 July 1945, the night before the scheduled test of the atomic bomb, and closes with Oppenheimer confronting his own condition and the implications of loss of soul in his aria "Batter my heart, three-person'd God" on the text of the sonnet by John Donne.

Act Two opens back in the Oppenheimer home, in the early hours of 16 July, where Kitty, in an alcoholic haze, reflects ("Now I say that the peace the spirit needs is peace, not lack of war...") and watches with the Tewa Indian women, her household help, for signs of the blast. A stunning orchestral interlude ("Rain over the Sangre de Cristos") suggests comfort and removal from the intensity of the situation, as does the Tewa lullaby sung by the housekeeper Pasqualita. A menacing element in the New York staging suggests the transformation of rain over the New Mexican mountains into

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the Black Rain soon to fall on Japan. In Act Two, the separate spheres of science and domestic life, scientific activity and Indian tradition, poetry and prose are fused and layered, with multiple locations and perspectives playing out in the same space. Scene Two, synchronous with Scene One, is about the tense wait and final preparations at the test site. Scenes Three and Four occupy the countdown, the minutes between 5:10 and 5:28 AM, with the action ending at Zero minus two minutes, and Oppenheimer's closing line: "Lord, these affairs are hard on the heart."

The characters, though based on historical figures, have a certain operatic familiarity. The cast is male-heavy, not surprising given the narrative. Title character Oppenheimer and his somewhat sinister foil, physicist Edward Teller, are both baritones, as are General Groves, the military commander of the project, and Jack Hubbard, the chief meteorologist. The more youthful and earnest roles of physicist Robert Wilson and the Army Corps physician Captain Nolan are sung by tenors. General Leslie Groves stands as the traditional powerful tyrant but with limits to his power: he can control neither the weather nor his weight. He berates his "wise men" when the long-suffering oracle Hubbard warns of volatile weather on the scheduled test morning ("I demand a signed weather forecast... if you are wrong, I will hang you") and camp physician Nolan warns of potential radioactive fallout ("What *are* you, a Hearst propagandist?").

Kitty Oppenheimer, originally conceived for a mezzo-soprano, was alternately crafted by Adams as a soprano role. (The Chicago performances employed a soprano; the New York performances, a mezzo.) The only other female role is the contralto Pasqualita, following the operatic convention of servants occupying the lowest vocal ranges. Following another convention is Pasqualita's deep voiced "earth mother" presence, representing those things that Native People know, distinct from those things that scientists know. Numerous unnamed figures appear on stage, forming the chorus of scientists, technicians, wives, military personnel, and support staff. Other historical figures factor into the narrative without appearing—including Fermi, Bethe, and President Truman.

Doctor Atomic is built on a text-dense libretto by Adams's collaborator Peter Sellars who constructed it entirely from pre-existing sources. Like Alice Goodman's libretto for Adams's earlier *Nixon in China*, this text stands well on its own; it's very good reading, as opera libretti go. Unlike the *Nixon* text, which is framed entirely in rhyming couplets, the *Doctor Atomic* book mixes, intertwines, and alternates poetry and prose of the most prosaic sort: excerpts from scientific and government documents and transcripts of actual conversations. The challenge to the composer becomes greater with a rich libretto, since the more meaningful and interesting the words, the less room the composer may find in which to be musically expressive. Traditionally, opera singing emphasizes the feelings that the words suggest more than careful articulation of those words. The weight of the *Doctor Atomic* text was not lost on the principal singers (mostly the same in the Chicago and New York productions), and their enunciation was exemplary and fully charged with meaningful intent. Nevertheless, given the vagaries of sung language, even when delivered to native speakers, surtitles are typically provided in Adams's operas to clarify the text and permit it to be processed quickly.

The *Doctor Atomic* texts which are prose-derived tend to a one-note-per-one-syllable of text style, rendering them more natural in delivery and more intelligible to the audience. The more florid (melismatic) style of traditional opera arias is employed primarily in the arias of the leading lady, Kitty Oppenheimer, whose two big arias (one each in Scene 2 of Act I and Act II) are settings of poems by Muriel Rukeyser (1913–1980). Robert Oppenheimer's Baudelaire music ("The soul is a thing so impalpable, so often useless..." sung to Teller in the first scene and "Long let me inhale, deeply, the odor of your hair" sung to Kitty in the second scene) are melodic but do not move into typical operatic prolongation of words as melody unfolds. Even in the opera's most memorable and most intense aria, Oppenheimer's song on the John Donne sonnet "Batter my heart" which closes Act I, the text setting is musically straight-forward. The first quatrain is repeated, as are some selected words and lines thereafter, but the musical treatment does not run ahead of (or behind) the poetic text.

Solo vocal lines consistently end with two-note slurs, often descending, on the last syllable of each phrase or sentence. This gesture, which musicians call "weak cadences" (and formerly called "feminine cadences") places the end of the phrase on the beat after the downbeat instead of on the downbeat itself. The cumulative effect heightens the sense of mental uncertainty and worry which permeate the work, even as the hyper-rhythms of the fast mechanistic passages generate a more physical sense of tension.

As typical in Adams, the musical styles employed are diverse. In addition to the electronic and noise elements, there are post-Wagnerian expressionist passages, delicate Debussy-like orchestral colors, hard-driving, dissonant, jittery episodes heavy on the brass and percussion. And in the private scene in Act I between Robert and Kitty, there was just a hint of Broadway, or perhaps a 1940s movie soundtrack. The choral interlude in Act II midway through the countdown

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“...in the New Testament, Jesus goes to the desert to confront his visions, to overcome his temptations, to struggle with the devil, to fight madness...The desert is associated with hallucinations and insanity. It threatens one’s normal thinking.”

Composer Steve Reich
about his Desert Music

(“At the sight of this, your Shape stupendous”) based on a text from the *Bhagavad-Gita*, suggests comparison to the most terrifying sections of the Verdi *Requiem*.

The original Peter Sellers production (as mounted in Chicago) better evokes the American Southwest than does the filmmaker Penny Woolcock’s production at the Metropolitan, particularly in the spare stage sets of the domestic scenes. And in Chicago, “the Gadget” dominated the stage more than in the new production and seemed more ominous. The New York design emphasizes a grid as the main visual anchor, variously serving as a gigantic table of elements, as cubicles for the workers, as a portrait gallery of the key historical figures in the Manhattan Project, and as screens for projections of maps, video images, and representations of the scientists’ computations. A secondary image in the New York staging is a series of white tents that suggest the Sangre de Christos (“Blood of Christ”) mountains. Their resemblance to photos of the 1958 Philips Pavillion (and thus, Varèse’s *Poème électronique*) again suggests Adams’s connections with other “bomb” music.

In the opening moments, particles become choreography, and scientific statements become liturgy. In Chicago, the women’s chorus describing the thirty-two points spaced equally around the plutonium core, was visually realized by dancers, interweaving “the centers of the twenty triangular faces of an icosahedron” with the “twelve pentagonal faces of a dodecahedron.” The opening choral lines become an anti-credo:

We believed that “Matter can be neither created nor destroyed but only altered in form.”
We believed that “Energy can be neither created nor destroyed but only altered in form.”
But now we know that energy may become matter,
And now we know that matter may become energy
And thus be altered in form.

We once believed, but now we know: from credo to documented fact. Neither comfort nor security are conjured by this liturgy... rather doubt and anxiety are the over-riding passions, beginning with the opening disembodied sounds (which seem in homage to Varèse’s *Poème*) through the countdown at the end of Act II, and the postlude, with the electronic score and the voice-over from a Hiroshima survivor. Ambivalence and ambiguity are the prevailing modes. The first exchange between the jaded Teller (“I have no hope of clearing my conscience”) and the Faustian Oppenheimer (“The soul is a thing... so often useless.”) raises the essential questions of relationships between responsibility and knowledge. Most dialogues in Act I emphasize doubt and second guessing: “We do not know when the first explosion will occur nor how effective it will be.” The paradoxes and inversions suggested in the Act I discussions (e.g. this weapon “potentially destructive beyond the wildest nightmares of the imagination” was “created not by the devilish inspiration of some warped genius but by the arduous labor of thousands of normal men and women working for the safety of their country”) leads logically to the inversions in Oppenheimer’s utterance of the sonnet:

Divorce me, untie, or break that knot again,
Take me to you, imprison me,
for I, except you enthrall me, never shall be free...

All music in some regard is about time. The interplay of regular clock time with personal experienced time gives us infinite variety in musical expressions of its passage. Operas typically operate on a grand out-of-real-time basis, with extended musical numbers suspending clock time so that personal inner-conditions can be explored. In *Doctor Atomic*, the countdown to the detonation establishes the basic terms. The frantic pace is protested by the young physicist Robert Wilson in the first scene: "Everybody is rushing around.... Nobody has a spare moment, and we work like dogs. It's hard to stop and think as one ought to." In the second scene, the more conventional private scene in the Oppenheimers' Los Alamos house, Kitty's opening aria ends "go spin the immortal coin through time/watch the thing flip through space/tick tick, tick tick." In the lab, in the home, in the desert, Adams's score is time-conscious throughout, even in the reflective moments.

Likewise, we are conscious throughout of the inexorable advance to the conclusion of the work. And we know from the outset that the conclusion is as inevitable as in familiar operas: *La Boheme*'s Mimi will expire as Rudolfo cries out her name at the final curtain; Tosca will leap to her death from the parapet of the Castel San Angelo; forces of divine retribution will drag Don Giovanni to hell. The conclusion of *Doctor Atomic* can only be compared to the close of Wagner's *Götterdämmerung*, when, after the final words have been sung, an immense and disembodied music prevails long enough for us to understand the cosmic shift that has occurred. But instead of ending with the detonation (and certainly not with the return of the plutonium to its source as Wagner's gold was returned to the Rhine), the opera ends just before the test at 5:30 AM on 16 July 1945. The historical outcome we know. Following word of the successful test, President Truman, meeting in Potsdam with the allied leaders, gave orders on 25 July to employ the bomb against Japan. On 6 August, the uranium bomb "Little Boy" destroyed Hiroshima, and on 9 August, the plutonium bomb called "Fat Man" was dropped on Nagasaki. Japanese surrender followed quickly. These historical facts we know. The larger questions remain unanswered.

In the early twentieth century, after Wagner's *Ring* had operatically destroyed the Valhalla and its god-occupants, restored the powerful gold to its source below the river, and wiped the slate clean for a new creation, opera composers including Schoenberg, Berg, and Bartok turned to exploring the dark inner-recesses of human experience rather than the epic expanses of the cosmos. In the late twentieth century, John Adams, who turned to history rather than to intensely personal experience, has frequently been credited with "re-inventing" opera, beginning with *Nixon in China* which premiered in 1987. In an essay in these pages (Easter 2007), I suggested that despite *Nixon*'s many unconventional features, it clearly exhibits the essential features of nineteenth-century grand opera. That suggestion was intended not to diminish its innovation but rather to point out that opera has been re-invigorated rather than re-invented. Some great composers have found it necessary to destroy in order to find a blank palette on which to create. Schoenberg and his systematic destruction of tonality comes to mind, and John Cage with his ultimate challenge to the definition and even the existence of a separate category of sounds to be called "music." Others, among them Bartok, Stravinsky and, I believe, John Adams, create seemingly radical new works but with deep connections to the past.

Natural causes, as we know, are at work which tend to modify, if they do not at length destroy, all the arrangements and dimensions of the earth and the whole solar system. But though in the course of ages catastrophes have occurred and may yet occur in the heavens, though ancient systems may be dissolved and new systems evolved out of their ruins, the molecules out of which these systems are built—the foundation stones of the material universe—remain unbroken and unworn.

James Clerk Maxwell (1873)

*"Wary of time O it seizes the soul tonight
I wait for the great morning of the west
Confessing with every breath mortality."*

Muriel Rukeyser

(1913–1980)

"Easter Eve 1945"

One of my favorite sentences written by Donald J. Grout in the 1960s (in an early edition of the venerable *History of Western Music*, known to music history undergraduates everywhere) comes to mind: “Classical forms remained, like the features of a landscape after a geological upheaval—recognizable under new contours, lying at strange angles beneath the new surface...” Grout was speaking of Beethoven, a disruptive force in musical culture who in the first quarter of the nineteenth century retained his Enlightenment-based ideals even while dismantling formal notions of compositional standards and rejecting inherited constraints on what could be expressed symphonically. The remnants and artifacts of past times, “lying at strange angles beneath a new surface” are found as well in *Doctor Atomic* with its compiled text and its collage of musical styles. Lying at strange angles are poems, equations, reports, nature, history, big science, ancient culture, politics, modern marriage, and caloric intake charts. The musical and visual materials are similarly juxtaposed in new relationships. Neither a simple narrative nor a score that previous operas have taught us to follow, *Doctor Atomic* starts from many locations—far away from Ground Zero—and leaves us with both recognizable and newly unrecognizable pieces to start putting back together into a new constellation. ♯

Linda C. Ferguson is Professor of Music and Chair of the Department of Music at Valparaiso University.