

# Reviews

Robert P Crease

## Atomic arias



Ken Howard/Metropolitan Opera

### Oppenheimer as opera

Baritone Gerald Finley stars as Robert Oppenheimer in an opera about the Manhattan Project.

### Doctor Atomic

John Adams and Peter Sellars  
Metropolitan Opera,  
New York, US

The American composer John Adams uses opera to dramatize controversial current events. His 1987 work *Nixon in China* was about the landmark meeting in 1972 between US President Richard Nixon and Chairman Mao Zedong of China; *The Death of Klinghoffer* (1991) was a musical re-enactment of an incident in 1985 when Palestinian terrorists kidnapped and murdered a wheelchair-bound Jewish tourist on a cruise ship. Adams's latest opera, *Doctor Atomic*, is also tied to a controversial event: the first atomic-bomb test in Alamogordo, New Mexico, on 16 June 1945. The opera premièred in San Francisco in 2005, had a highly publicized debut at the Metropolitan Opera in New York in 2008, and will have another debut on 25 February – with essentially the same cast – at the English National Opera in London.

Was there ever more operatic material? The Manhattan Project to build the bomb involved several powerful and charismatic individuals who worked amid all-out war to develop a weapon of mass destruction before the German enemy (that also had an

excellent scientific-engineering establishment) could do the same. The weapon could potentially kill hundreds of thousands of civilians, but the cost of not developing it seemed greater. The project would have profound social, political and military consequences sure to reshape the world in unforeseen ways. If this is not the stuff of opera, the art form is dead.

Yet historical drama is itself contentious. If the subject is long ago and far away, it does not matter if facts are altered or characterizations changed. While a historian of 16th-century Spain might have trouble with Verdi's history in *Don Carlos*, a modern opera-goer does not. But when historical drama involves people whose words and deeds continue to affect the present, tampering with elements of history can make the drama collide with our experience of the world and our concerns about historical accuracy. This is what provokes discomfort with works like Oliver Stone's biopic *JFK* and Michael Crichton's novel *State of Fear*. The former feels like grave robbing, the latter like propaganda.

*Doctor Atomic* also invites judge-

ment on the issue of historical accuracy, with its libretto announcing that it is “drawn from original sources”. This issue is especially acute for physicists, who may have different reactions to Adams's opera as artistic expression and as historical depiction.

Musically, Adams's style is partly minimalist: he relies on repetitive instrumental and rhythmic motifs for the music's basic framework. At times the choral parts are chant-like and hypnotic. Moments of drama are heightened by changes in instrumentation, density, texture and dynamics. Much of the overall musical effect, in combination with the pageant-like staging, is static rather than forward-moving as in traditional opera. The atmosphere – the growing tension surrounding the imminent testing of the bomb – is highly charged, but everything feels like it is running to stand still.

The most notable exception occurs at the end of act 1, when Robert Oppenheimer is alone on stage looking up at the starkly lit, terrifying weapon of mass destruction suspended in mid-air. As he sings “Batter my heart”, a dirge-like aria set to a John Donne poem, a loud, rhythmic interlude suddenly disrupts the aria, rising in intensity and volume, contrasting sharply with its quiet lyricism. This haunting scene is more than a lament: it is Oppenheimer's soul in turmoil, a turmoil he in fact never articulated. It is a powerful moment, opera at its finest, integrating music, lyrics and staging to disclose more than one could glean from the historical record.

More notable moments include the culmination of the first scene, when the Edward Teller character wonders “Could we have started the atomic age with clean hands?” And at the opera's climax, the time until detonation arrives asymptotically in a provocative way: we hear the five-minute-warning rocket, seven minutes later the two-minute warning, and the clock continues to tick as time itself seems to run out.

Other arias feel overly long, with a melodic content that is divorced from what is going on orchestrally. Many characters are unevenly realized. When General Leslie Groves, the project's commanding officer, sings “There is concern our high-strung director might have a breakdown”, this is news to the audience, who have witnessed nothing to make this assertion

credible. The aria by Oppenheimer's maid Pasqualita is overextended, and in combination with the appearance on stage of her costumed kin threatens to portray Native Americans, stereotypically and patronizingly, as innocent, peace-loving children of nature.

Those familiar with the Manhattan Project, the events of which galloped with a terrifying swiftness, may feel impatient with the opera's slow-moving pace, and legitimately disturbed by the characterizations. When Oppenheimer says that the "nation's fate should be left in the hands of the best men in Washington", the words are indeed from an historical document, but an unreliable one – a book by Oppenheimer's nemesis (and character assassin) Teller.

Teller, in fact, was unsympathetic to physicist Leo Szilard's petition to withhold use of the bomb. Teller, who died in 2003, had no tolerance for ambiguous aspects of human behaviour, and would denounce as unpatriotic those who were less enthusiastic than he was about the development of nuclear weapons. In later years, he was also often dishonest about his views, particularly with respect to Oppenheimer. It is troubling, if not outrage-

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ous, to make Teller one of the principal voices of worry and caution.

Equally problematic is Adams's portrayal of Oppenheimer's wife Kitty, the sole female voice among the principal singers, as a tortured earth-goddess who possesses, as Adams put it in one interview, a "cosmic, superhuman awareness of what it all means". The historical Kitty – a volatile alcoholic, rather than a reflective alcoholic, as she is portrayed here – was not cut out to play this part. Finally, the portrayal of Groves as a stereotypical, buffoon-like military wonk is unjust to the minister's son who attended the Massachusetts Institute of Technology, graduated near the top of his class at the West Point military academy, and was a fine en-

gineer and superb administrator.

Deviations from the historical record in an historical drama generally mean that the author is afraid to trust the inherent drama of the actual events. They also tend to reflect the presence of social prejudices and deep-seated cultural myths, which appear – so to speak – to wrest control of the artwork from the artist.

*Doctor Atomic* has passages that are sonorously and visually seductive, and it offers a novel way to portray contemporary events using artistic means. But its historical deviations – which reflect prejudices and myths about Native Americans, patriotism, women and the military mind – are one reason that this ambitious project is not more gripping. The dramatic portrayal of perhaps the single most ethically controversial event of the 20th century should stir up a greater anxiety, and leave us with the feeling that humanity has dirtier hands than we ever imagined.

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## Web life: The Periodic Table of Videos



URL: [www.periodicvideos.com](http://www.periodicvideos.com)

Eagle-eyed readers may spot a change in this column. Previously known as Blog life, it highlighted top picks from the physics blogosphere, and was itself an outgrowth of an earlier column on physics books, Shelf life. The new Web life column will continue to feature the best of physics blogging, but it will also include other types of Web content of interest to *Physics World* readers. First up is a periodic table of videos from Nottingham University in the UK.

### What is it?

The website's main page contains a periodic table with links to short (about five minute) videos on all 118 chemical elements. It is the brainchild of video-journalist Brady Haran, who teamed up with a

group of chemists – most notably the Einstein-haired Martyn Poliakoff – from Nottingham University to produce the short films.

### Can you describe a typical video?

Almost all of the videos are structured around anecdotes from Poliakoff, a veritable chemical raconteur who even manages to spend nearly three minutes talking about unniloctium, otherwise known as element-118. Videos of the more common elements often feature trips to the laboratory or chemical stockroom, where chemists Pete Licence, Stephen Liddle and Debbie Barnes examine carefully wrapped samples, play with gases and/or blow things up. The science they present is serious and well explained but the researchers are also clearly having fun.

### Who is it aimed at?

The most obvious answer is chemists, but there is plenty here for the more physics-minded as well. For example, the video on helium has a nice demonstration of gas-law physics (as well as the obligatory squeaky voices), and the lanthanides and actinides beloved of nuclear physicists and engineers are not neglected – in fact, they are Liddle's speciality. Many of the videos also contain laboratory stunts that should definitely not be tried

at home, and these should appeal to science teachers with limited budgets (or nerve!) for, say, dropping lumps of caesium into water.

### Why should I visit?

In an introductory clip, Poliakoff compares the periodic table to a family: some members you know well, while others (ruthenium, anyone?) may not be as familiar. Whether your most recent peek at Dmitry Mendeleev's table came last week or last century, you are sure to find something here you did not know. After watching a few videos, you may even find yourself thinking "Oh, just one more..."

### How often is it updated?

The team finished the periodic table in summer 2008, but the researchers have not rested on their laurels. Updated videos crop up every few weeks, and the site maintains a list of elements soon to be refreshed. In late 2008 Liddle and Haran travelled to Ytterby, Sweden, to make a special video about the mine where four elements – yttrium, erbium, terbium and ytterbium – were discovered.

### Can you give me a sample quote?

"Potassium is very reactive. One of my colleagues who used to work with it describes it as 'evil'," says Poliakoff.