

MEDIA COLUMN

In addition to longer reviews for the media column, we invite you to watch for and submit short snippets of instances of women in mathematics in the media (WIMM Watch). Please submit to the Media Column Editors: Sarah J. Greenwald, Appalachian State University, greenwaldsj@appstate.edu and Alice Silverberg, University of California, Irvine, asilverb@math.uci.edu.

A Review of *Completeness*

Alice Silverberg

I loved the first half of *Completeness*, a play commissioned by the Sloan Foundation and the Manhattan Theatre Club, whose World Premiere took place in April at South Coast Repertory [1].

The *Completeness* of the title comes from NP-completeness, the concept from complexity theory. The program [2] includes a full page on “P vs NP—A Million Dollar Problem” (excerpted from a *Science News* article by Julie Rehmeier) and another full page explaining “The Importance of Algorithms” and “The World of Microbiology.”

The comedy revolves around Eliot, a theoretical computer science grad student, and Molly, a molecular biology grad student, and the ups and downs and intertwining of their relationship and their academic careers.

If the goal (as it often seems to be) is to make math sexy to the general public, this play is a good model for how to do that. Eliot’s post-coital explanation of the Traveling Salesman Problem was brilliant. This was one of the most daring attempts to give a lengthy authentic explanation of a serious mathematical problem that I’ve seen in a play, and I think it was largely successful. The audience oohed and ahed in surprise and wonder at the large number of possible routes among a small number of cities. It’s nice to see a playwright who respects his audience enough to risk a long scientific explanation (the lengthy monologues on relationships came closer to straining the audience’s attention span than did the mathematical scenes). However, it’s possible that the appreciative and small audience at the Easter evening performance was largely a scientifically inclined one.

The playwright, Itamar Moses, became intrigued by the Traveling Salesman Problem when he took an electrical engineering class as an undergrad at Yale [3]. At a “post-show discussion,” the actor who played Eliot told the audience that he got very interested in the Traveling Salesman Problem while preparing for the part, learned a lot about it, and was so enthused that he even tried to solve it himself. A molecular

biologist came to a rehearsal and spoke with the cast about biology and various aspects of being in academia. I think that the efforts of the playwright, director, and actors to get science and scientists right paid off in the resulting authenticity (though I don’t know if the molecular biology was as authentic as the computer science).

For me, the best part was how egalitarian the play was. The protagonists are smart, strong, and independent. Two female supporting characters are computer science students. While all the characters have personal failings, they come across as competent scientists. The way the sex and the science mixed, including excessively logical “relationship” dialogue, was amusing. Even the full nudity was very egalitarian, a refreshing contrast to performances that feature female nudity and remind the viewer that the intended audience is heterosexual males. The playwright’s past experience seems to consist largely in depicting hyperintelligent ambitious men [4,5]. This seems to have served him well in portraying female scientists, though I was left, despite the cast’s marvelous acting, with a fuller understanding of and empathy for Eliot’s motivations than for Molly’s.

Issues of women in science arose in advice to the female students from their teachers: “You’re a woman in this field, so protect yourself. Start now.” Also, the thesis advisor mistook a grad student for a secretary.

While the play wasn’t as clear as I would have liked that the romantic relationship between Molly and her thesis advisor should never have happened at all, I think it did a great job of showing what sexual harassment looks like from the point of view of the less powerful partner. The theater’s video of excerpts from the play [6] includes part of the advisor-student confrontation. The breakup scene ends when Eliot interrupts and the advisor says they “were just discussing Molly’s funding for next year, that’s all” (to gasps from the audience).

The scenic design was awesome. The set is clever and complex, and watching the changes of set was like watching someone solve a mathematical Rubik’s Cube-like puzzle. Everything fit perfectly. Its one failing was that some of the action could be seen better from one side of the theater than the other.

The second half of the play fell apart, both intentionally and otherwise. It would have been nice if the use of NP-complete problems as a metaphor for everything, including human relationships, could have led to an interesting resolution of the plot. Instead (spoiler alert—though having this spoiled may increase your appreciation of the play), the playwright had the bizarre idea of showing that things

fall apart and backtrack before they get better by having his play fall apart. The actors did such a great job of convincing the audience that the electricity really went out for an extended period, that afterwards I contacted the theater to say that the power outage marred my understanding of the play and made it hard to write a review. I was surprised when they said that was all scripted, but they offered me comp tickets to see the play again. It was much better the second time around, when I knew that the flaws were intentional. However, it came across to me as if the young playwright realized too late that he wasn't going to meet the deadline for the commission, so he threw the second half together in a couple of all-nighters. If all the audience talks about afterwards is how "they flubbed the lighting," it's hard to consider that a success. The actors thought that about half the audience left the theater thinking the power outage was real.

The playwright has a talent for communicating science and for creating authentic dialogue and atmosphere for

scientists in academia. I hope that next time he plays on those strengths, rather than over-experimenting with what I've now learned is called "metatheatricality."

[1] <http://www.scr.org/calendar/view.aspx?id=3380>

[2] <http://www.scr.org/media/pdf/10-11programs/completeprog.pdf>

[3] <http://www.scr.org/interactive/dialoguefeb11/dialoguecomplete.aspx>

[4] http://articles.ocreger.com/2011-04-19/news/29452519_1_itamar-moses-scr-ambition

[5] <http://www.ocreger.com/entertainment/-297702-.html>

[6] http://www.youtube.com/watch?v=z8_3mNNGijw