Review of *The Thrilling Adventures of Lovelace and Babbage: The (Mostly) True Story of the First Computer*

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appears in *Math Horizons*, February 2017, page 16

Imagine trying to read a book that defies your own idea of what a "book" really is. You ask yourself: is it fiction? (Definitely not: the two main characters are the striking Victorian individuals Ada Lovelace and Charles Babbage; the main subject matter is Babbage's notoriously-elaborate Difference Engine and his designed-but-never-built Analytical Engine.) Is it nonfiction? (Definitely not: some of the plots are deliberate fantasy, set in a fictional universe in which the Analytical Engine was actually built, and in which Lovelace and Babbage can take fantastical journeys through towering replicas of the Engine's cogs, levers, and gears.) Is it a comic? (Maybe. Certainly, the main action is presented in graphical panels as in a typical comic. But would a comic have hundreds of substantial footnotes and endnotes, presenting fastidiously-researched evidence from original historical documents?)

These are the questions you will face when reading *The Thrilling Adventures of Lovelace and Babbage: The (Mostly) True Story of the First Computer*. This extraordinary 315-page graphic novel by Sydney Padua was first published in 2015, and a British paperback edition was released in August 2016. There is a Kindle edition too, but apparently it's hard to zoom in on the footnotes which are at least half the fun. So try to get your hands on one of the print editions, which are beautifully-produced with exceptional aesthetics.

There's no need to trust my own recommendation: Padua's book has already won the The Neumann Prize, awarded by the British Society for the History of Mathematics for a book aimed at a broad audience. *Lovelace and Babbage* also garnered two nominations for Eisner awards, the most prestigious awards for comics of any kind.

At its core, the book tells the story of the intriguing collaboration between Babbage and Lovelace in producing designs for the Analytical Engine—in the author's own words, "an imaginary comic about an imaginary computer." Even without the fictionalized trappings of *The Thrilling Adventures*, the story overflows with Victorian romanticism. Lovelace was the daughter of the poet Lord Byron and a gifted mathematician who aspired to produce "poetical science." Babbage was an eccentric genius, appointed Lucasian Professor of Mathematics at Cambridge and known for hosting soirées of intellectuals and scientists at his London home. Padua develops the story in a fictional universe, showing the comical results of hypothetical meetings between Babbage, Lovelace and other eminent Victorians such as George Eliot, Jane Austen, Charles Dickens, George Boole, Augustus de Morgan (yes, *that* de Morgan) and Charles Dodgson (the Oxford mathematician who wrote *Alice in Wonderland* under the pen name Lewis Carroll).

In all cases, the true version of events is documented in remarkably erudite footnotes and endnotes. In fact, I think mathematicians will enjoy—as I did—keeping track of a quantity that we might call "note depth." On page 37, I reached a note depth of 4 while reading an indented block quote in a footnote to an endnote to a footnote. The topic of that footnote, you ask? The Belgian inventor of rollerskates, one John Joseph Merlin (1735-1803).

It's hard to convey the delight that this unexpected wealth of detail brings to the book. There even appears to be a genuine research contribution to the history of science. Lovelace is often billed as the world's first computer programmer, since she provided detailed technical descriptions of algorithms that could be implemented on the Analytical Engine. Scholars have sometimes disputed the true extent of Lovelace's contribution. But on page 241, Padua cites an 1867 letter that was perhaps disregarded by previous scholars. It provides a first-hand account of Babbage's high opinion of Lovelace, stating she had a "peculiar capability—higher he said that anyone he knew" for programming the Engine. Padua, too, has a peculiar capability. She has given us an extraordinarily enjoyable, yet intellectually rewarding, insight into an important story in the history of mathematics and computing.