

EXHIBITION

The enchantress of numbers

Two hundred years after her birth, a new exhibition explores the life of Ada Lovelace

By **Andrew Robinson**

Any visitor to the London Library inevitably walks past a commemorative blue plaque attached to a neighboring house in which once lived the remarkable Ada, Countess of Lovelace (1815–1852). Ada Lovelace is well known for three reasons. She was the daughter of the Romantic poet Lord Byron, who separated from her mother when Ada was just 1 month old. (Despite his early abandonment, she ultimately chose to be buried next to Byron in the family tomb.) She was also the first person to discuss the concept of programming a computer: In the 1840s, she issued an extensive and far-sighted commentary on a calculating machine known as the Analytical Engine, created by the mathematician and inventor Charles Babbage.

Those who are unfamiliar with Lovelace's biography may recognize her name nonetheless: In 1980, a high-level computer programming language, Ada, was created for the U.S. Department of Defense. The language is still widely used today. With the recent establishment of Ada Lovelace Day on 13 October, she has become something of an iconic figure for those whose goal is to increase the profile of women in science, technology, and mathematics.

For the bicentenary of her birth, the Science Museum in London, which holds Babbage's Difference Engine and Analytical Engine, is displaying a small but intriguing exhibition about Lovelace's brief life and mathematical work. In addition to a prototype of the Difference Engine and the unfinished Analytical Engine, the exhibition includes a model of a Jacquard loom. Whereas the punch cards of

the loom wove flowers and leaves, those of the engine would weave algebraic patterns, she once observed.

The exhibition also features two color portraits of Lovelace, each depicting her as a fashion-conscious young lady. She was not overly fond of either portrait; one of them prompted her to comment that her jaw looked large enough to write the word "mathematics" on it.

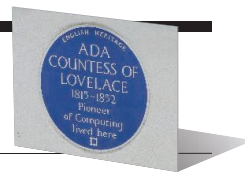


According to Lovelace, this portrait, painted in 1836, rendered her jaw large enough to write the word "mathematics" upon.

Originals of her letters from the collections of the British Library and the Bodleian Library appear alongside a digital display, which allows the visitor to follow the progress of her work and her interactions with Babbage, Michael Faraday, and others.

Speaking of the Analytical Engine, she once pointed out that, because the engine generates numerical data, many people

Ada Lovelace
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might mistakenly assume that it is only useful for arithmetic. On the contrary, she argued, "The engine can arrange and combine its numerical quantities exactly as if they were letters or any other general symbols; and in fact it might bring out its results in algebraical notation, were provisions made accordingly."

In a remark that presciently foreshadows the digitization of music, she goes on: "Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expression and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent."

Several historians of computing, including Doron Swade, one of the advisers to the exhibition, have observed that Lovelace had a rather high opinion of her own intellect (*I*). For example, in 1843 she informed Babbage that "the more I study, the more insatiable do I feel my genius for it to be." Comparing herself with her father, she wrote: "I do *not* believe that my father was (or ever could have been) such a *Poet* as I shall be an *Analyst* (& Metaphysician)." The exhibition organizers downplay this conceit, diplomatically stating that "Her distinctive mixture of mathematical analysis and unbridled imagination brought unique insights into what the Analytical Engine could achieve."

Sadly, because Babbage never completed the engine, for lack of public funding, we shall never know what it might have produced. And since Lovelace died from cancer in her 30s, her potential, too, went unfulfilled. But despite her untimely death, her legacy as a "prophet of the computer age" is very much alive today.

REFERENCES

1. D. Swade, *The Cogwheel Brain: Charles Babbage and the Quest to Build the First Computer* (Little, Brown, London, 2000).

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