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WOR(L)DS

By their thousands: *what Ada Byron knew* >>

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Bletchley Park is full of secrets. Closed to visitors until the 1990s, the demure manor house grounds of the English wartime code-breaking compound resist disclosure of any kind. 'Keep it under your hat' a poster reads, 'Careless talk costs lives'. There's an actual hat depicted there, though not a fedora or a bowler. This one's a lady's hat.

At the height of World War II, 12,000 people contributed to the code breaking efforts at Bletchley. 8000 of them were women. Known as the Wrens, these women programmed and operated the machines that decrypted German, Italian and Japanese enemy intelligence, and reportedly shortened the war by up to four years. Along with everything about Bletchley, the Wrens' work and their very existence were silenced by the Official Secrets Acts until 1978.

Lift the hat further though and you discover that the Wrens were not alone. Concurrently in the United States, women at the University of Pennsylvania were setting up the Electronic Numerical Integrator and Computer (ENIAC), America's first electronic computing machine. Before the twentieth century masculinisation of the computer business, before the computer geeks, there were the computer girls. In fact almost all those working in computing until peace broke out were girls. With a few exceptions, even today their working lives remain undisclosed. At the time they were obliged not to say.

The intellectual life of a particular nineteenth century woman, however,

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reaches across time to the Wrens and to us, and contrasts this non-disclosure. Ada Byron was an Englishwoman, an aristocrat, and by 1843 the world's first computational analyst. Her legacy is the earliest description of an algorithmic machine and the earliest account of a woman in computing. On the day I visit Bletchley, I wonder about Ada and the seemingly persistent invisibility of women working in technology today.

Ada was born in 1815 to the poet Lord Byron and mathematician Annabella Milbanke. In surely one of the briefest and worst marriages in history, romanticism and rationalism collided in the house of Byron to produce the first modern programmer with a foot in both camps. Ada grew up on maths. With her father banished to Italy, her mother raised her on a diet of numbers alone. Annabella was concerned with starving the poetic appetite that Ada might have inherited. She needn't have worried – Ada was a geek.

Luckily for her then (though dependent on the social and economic rank of your parents) the 1820s were a uniquely gender-blind time in terms of homeschooling in the sciences. For Ada this meant exposure to England's mathematical elite. And the best of this

elite was Mary Somerville. Somerville is an interesting case – both in her own time and, for different reasons, ours. A self-taught scientist, polymath, mother and astronomer, Somerville was also a self-identified dark star in a male constellation. Though her epic legacy includes the coining of the term 'scientist', Somerville shrunk from public exposure and famously shrouded her gifts.

She claimed not to possess genius for 'that spark from heaven is not granted to the sex' (Winter 207) – rather she saw herself as capable only of perseverance. When she became the first woman member of the Royal Astronomical Society, she declined the invitation to attend the inauguration. In fear of embarrassing the men, she sent apologies with her husband and continued to teach Ada.

At this time, the English mathematical community raced to catch up with its continental counterparts. Leading this charge was Charles Babbage. Babbage had an idea to mechanise calculus. And Babbage was thinking big.

In the science museum in London today, you can visit Babbage's Difference Engine, only built after his death. You can also visit his brain. Next to the machine and under his brain is his day book. In 1843 it records the day when the Lady Ada Byron (by now, the married Lady Lovelace) attended to discuss what are known as her notes.

These notes are Ada's only legacy – she died nine years later at the age of 36. They are her remarks on the Analytical Engine. For Ada and Babbage this was the next logical step from the Difference Engine; for us it is the first general-purpose computer.

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In these notes we find the earliest interpretation of algorithmic technology, pre-dating Alan Turing and the Wrens by 100 years. Babbage was a curmudgeon, famous for designing engines no one would build. Ada was a visionary, she saw the potential of a machine that could convert numbers into symbols. She said that one day someone would design a general principle to govern this kind of system and that this would be applied not only to mathematical abstraction but to art, music and communication. Out of the crash of poetry and logic, she was the one that said 'Don't you see?'

I am a theatre director. I try to tell stories that matter. When I first read about Ada I knew it was a good story and was sure I knew why. At first I thought this was because it showcased an intellectual robbed by the social code of her time, that her real impact was misplaced for over a century in a history mediated by powerful men.

Now, though, I see I got that wrong. Her legacy was misplaced only because she died young. Ada didn't keep what she did a secret at the time, not as Somerville did. And it's this tendency by women towards secreting their achievements in male dominated professions that adds dimension to the persistently clandestine legacy of the Wrens.

In reading Ada's personal letters (as published in *Ada, the Enchantress of Numbers*), you meet a person not only

of extreme skill, but one given to self-disclosure, insistence and lack of apology. In a vacuum of women speaking publicly on mathematics, she wrote to Charles Babbage and chided his inaccuracies. While Somerville said that her mind was not capable of creative logic, Ada counted her ideas as the ones that mattered. She was a secret to no one, especially herself. She was the future in more ways than one.

The history of women in computers catches people off guard today. While the 50-year silence on the nature of the work at Bletchley and the 8,000 women engaged in it was broken in the 70s, it is still seen as revolutionary when a female mathematician wins the Fields Medal. Why? It is seen as revolutionary to be a woman with skill enough to code for Google. Why, when programmers were mostly women to begin with? The computing workforce during the war could be seen as circumstantially female. And it was. But it was also shot through with brilliance, innovation and skill. It could also be seen as only circumstantially secret, but I think this still sounds a warning in a time where a strong narrative on women's ability to lead in the technology business is urgently needed.

A 2004 study by the National Center for Women and Information technology (NCWIT) found that women already employed in the technology industry are leaving at staggering rates. Given the aggressive sexism of the programming business today, it is no wonder that, despite their antecedents, contemporary women who are gifted in the computational sciences tend to assume Somerville's posture and keep it under their hats.

But there is no chromosome for innovation. And the next Ada could be anywhere. Standing on the grass at Bletchley, I remember them – the women and girls by their thousands working at a time when no one knew where this thinking would take us. But Ada did and would have done it herself if she had lived. And so I think that even today, when you are a woman, what you are doing can be as secret as you like, and maybe it needs be. That you are doing it though needs to be shouted out loud. From Ada, to the Wrens, to the ENIAC girls, the impact of women in computing through time is already there if you look for it.

Don't you see? The secret's out.

'Ada Lovelace 1838' aka Ada Byron by William Henry Mote

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