

INFORMATION PIONEERS: EPISODE ONE

ADA LOVELACE

RED KINGDOM

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INFORMATION PIONEERS: ADA LOVELACE

ARCHIVE FOOTAGE begins over:

ADVOCATE (V.O.)

It's the summer of 1833 in London.
A 17 year old girl -- fiery, stubborn,
determined to grab life and knowledge
with both hands -- bursts onto the A-
list party scene.

Her name is Ada Lovelace and she's
about to see the future. Our future.

With hell-raising poet Lord Byron for
a father and wealthy amateur
mathematician Annabella Millbanke for
a mother, Ada is already a minor
celebrity.

In the STUDIO:

ADVOCATE

Poetry or Maths. Ada's mother is
desperately trying to stop her
following in her father's footsteps.
But Ada's multi-talented, just 17 and
wants to try everything.

All around her society is
industrialising, the age of machines
is arriving and the battle between
emotion and reason, art and science is
raging. And it's raging fiercely in
Ada too.

Until at one party Ada meets a
charismatic genius - Charles Babbage.
He demonstrates to her a working part
of a larger machine that he is
building, called a Difference Engine.

ANIMATION illustrates:

ADVOCATE (V.O.)

-- Babbage's engine used a mechanical
process. This was nothing new.

-- Trains and clocks and factory
machines were changing and
revolutionising physical activity
everywhere.

-- But here, by cranking a handle, was
a machine that was replicating, with
100% accuracy, a *mental* activity.

(MORE)

-- Wheels, gears and levers worked together to produce a mathematical solution. It was the first automatic calculator!

In the STUDIO:

ADVOCATE

The engine was the talk of London. Was this a de-humanising machine? A wonderful miracle? But Ada didn't see a conflict here between science and poetry. She suddenly saw them in harmony.

Ten years later, Ada Lovelace had become something of an expert in Babbage's engines. And she had remained good friends with the inventor, who was now designing a major upgrade to his machine.

ANIMATION illustrates:

ADVOCATE (V.O.)

-- Babbage's new invention used an idea he and Lovelace had both seen working in the revolutionary Jacquard Loom. A series of hole-punched cards were fed into the loom as a set of instructions. The holed pattern on the cards determined the pattern of the weave.

-- Babbage now adapted the same principle. So Operation Cards, with patterns of holes, dictated what kind of calculations the engine's mechanics should perform.

-- Other cards could be taken from a reserve, like a memory bank, if the machine needed to change its instructions during a calculation.

-- So whereas the Difference Engine could only perform calculations using one method, this engine could be run on any method that could be 'programmed' into the cards.

-- Babbage called it an Analytical Engine.

In the STUDIO:

ADVOCATE (CONT'D)

And virtually no one knew about it. Babbage had only given one public talk in Turin. It was Ada Lovelace who translated an account of that talk into English and, with Babbage's encouragement, added her own notes. Those notes ended up being longer and more important than the original essay.

ANIMATION / ARCHIVE FOOTAGE illustrates:

ADVOCATE (V.O.)

They drew out detailed work on the sequences of instructions Babbage had developed for his Operation Cards. This is exactly what we'd now call programming. And that's how, with one set of these instructions, under the unassuming title of 'Note G', Ada Lovelace published what we now recognise as the first computer program.

But the notes went much further than this. Further than even Babbage had imagined. Ada had found the poetry in his scientific machine:

"The Analytical Engine", she wrote, "weaves algebraic patterns just as a Jacquard Loom weaves flowers and leaves."

While Babbage had just focussed on using the machine for arithmetic, Ada saw that numbers could represent something other than quantity in the machine. The engine could manipulate these numbers, like symbols in algebra, and then express them as:

Language. Graphics. Even music. In fact the machine could create anything you could produce a form of instructions for.

In the STUDIO:

ADVOCATE

This was the leap from calculation to computation. An incredible leap of the imagination. And of belief.

(MORE)

Because by then Babbage was a long way off the mainstream: his Difference Engines, dogged by engineering and financial problems, were now just lying in pieces; the Prime Minister thought he was living in a dream-world; his ideas were mainly ignored by British scientists and engineers; his theories, without our modern electronics to illustrate them, were very difficult to grasp.

Against all this, Ada stuck passionately to her convictions about the potential of Babbage's engines.

These convictions were virtually ignored for around a hundred years before new technology brought them back to life.

The paper Ada published, ten years after she'd first seen the Difference Engine at 17, described the computer-driven technology we all now take for granted.

ARCHIVE FOOTAGE illustrates:

ADVOCATE (V.0.)

And since Babbage's Analytical Engines were never actually built, Ada Lovelace's instructions and vision for the first computer are our glimpse into a unique moment...

...when two people, in 1843, saw our world.

END