
!!!!!!!!!!!!!!!!!!!!!!!!!!!!THE!!!!!!!!!!!!!!!!!!!!!!!!!!!!

THRILLING ADVENTURES OF LOVELACE

and



BABBAGE*

**The (Mostly) True Story of the First Computer*

SYDNEY PADUA

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Library of Congress Cataloging-in-Publication Data
Padua, Sydney
The Thrilling Adventures of Lovelace and Babbage / Sydney Padua
pages cm
ISBN 978-0-307-90827-8 (hardcover, alk paper) ISBN 978-0-307-90828-5
(eBook)
1. Graphic novels. I. Title.
PN6737.P34T48 2015 741.5942-dc23 2014004455

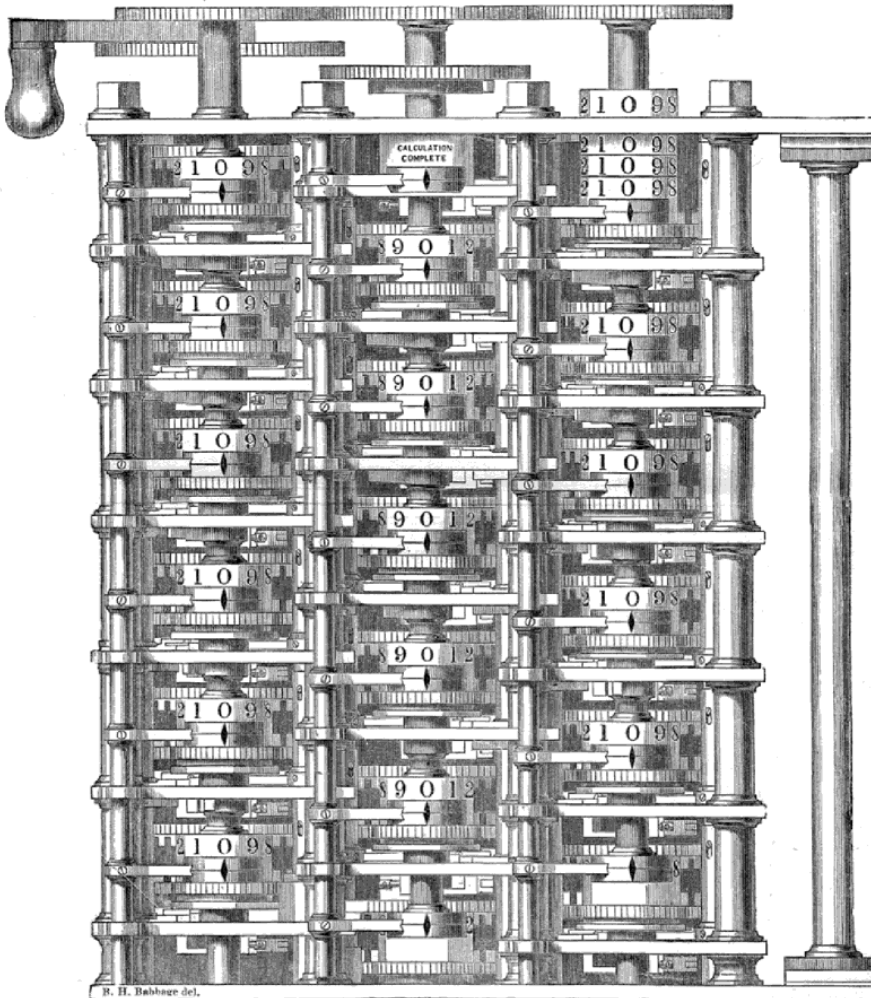
www.pantheonbooks.com

Cover art and design by Sydney Padua

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MR. BABBAGE'S DIFFERENCE ENGINE.



Small Portion of Mr. BABBAGE'S DIFFERENCE ENGINE, No. 1 (CALCULATING MACHINE), the property of Government; in the Museum of King's College, Somerset House (p. 142).

Engraving of the only working fragment of Charles Babbage's first calculating device, the Difference Engine. From Stories of Inventors and Discoverers in Science and the Useful Arts, John Timbs, 1860. Author's own collection.

!!!!!!! **Triumphant Debut of** !!!!!!!

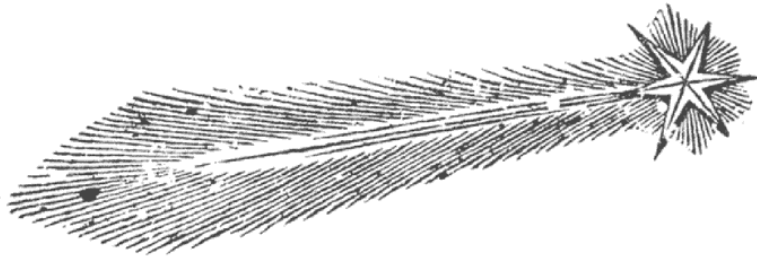
ADA

Countess of

Lovelace.

THE

SECRET ORIGIN!



WITH the Celebrated and Ingenious Mechanician, Professor

CHARLES BABBAGE,

ESQ., M.A., F.R.S., F.R.S.E., F.R.A.S., F. STAT. S., HON. M.R.I.A., M.C.P.S., INST. IMP. (ACAD. MORAL.),
PARIS CORR., ACAD. AMER. ART. ET SC. BOSTON, REG. OECON. BORUSS., PHYS. HIST. NAT. GENEV., ETC.

and his

Wonderful Calculating Machine,

The Tragical Conclusion Marvelously Averted by the Formation of
A POCKET UNIVERSE
to Be the Scene of Diverse Amusing & Thrilling Adventures,
With Humorous CUTS and Other PICTORIAL Embellishments!

ADA was the only legitimate child of "mad, bad, and dangerous to know" poet and nutcase Lord Byron.

Her mother Annabella fled ~~the exploding planet~~ her husband but was afraid their daughter would inherit his **WILD BLOOD!!**



ADA
MUST NEVER
BECOME
POETICAL!

ONLY ONE
THING HAS THE
POWER TO SUBDUE
POETRY...

...**MATHEMATICS!!**



* Lord Byron (1788–1824), radical, adventurer, pan-amorist, and poet,¹ was described as “mad, bad, and dangerous to know” by one of his many, many lovers, the writer Caroline Lamb.

* Anne Isabella Milbanke (1792–1860) was a deeply moral Evangelical Christian and prominent anti-slavery campaigner. She was also a keen amateur mathematician and Byron called her “the Princess of Parallelograms.” She married Byron when she was twenty-two and he was twenty-six.

* Amazingly, it didn't work out.²

Ada's young mind was conditioned away from dangerous poetical proclivities...



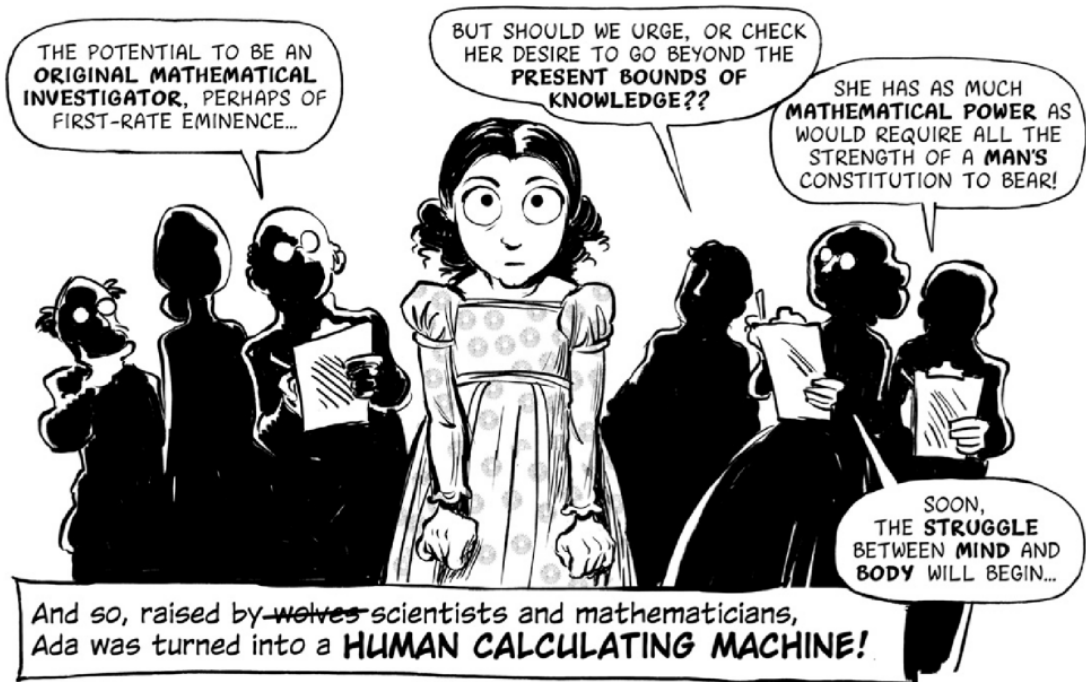
...and trained from her earliest years to control the chaotic forces lurking within her heredity!



✧ Lady Byron told three-year-old Ada's nurse: "Be most careful always to speak the truth to her [. . .] take care not to tell her any nonsensical stories that will put fancies into her head." Throughout her life, Ada was closely watched for signs of her father's "poetic" influence.³

✧ "Certainty not uncertainty" is quoted from one of Ada's tutors, William Frend;⁴ I had to double-check that three times before I could believe he'd written something so perfectly in character. Frend was a mathematician so conservative he didn't believe in *negative numbers*. Don't even get him started on imaginary numbers.

✧ Ada's upbringing was strict and lonely.⁵ She was given lessons while lying on a "reclining board" to perfect her posture. If she fidgeted, even with her fingers, her hands were tied in black bags and she was shut in a closet. She was five years old.



MEANWHILE, supergenius inventor **CHARLES BABBAGE** labors on the radical non-human calculating machine!



* "The potential to be an original mathematical investigator," etc., quoted from one of Ada's later teachers, the great logician Augustus De Morgan⁶ (although he said this much later, when Ada was twenty-seven; this fascinating letter can be found in [Appendix I](#)).

* Charles Babbage⁷ was Cambridge Lucasian Professor of Mathematics, a founder of the Statistical Society, and "the logarithmical Frankenstein" (according to the *Literary Gazette*, 1832). In his own time the celebrated Mr. Babbage was famous as the inventor of a brilliant, incomprehensible, and perpetually unfinished mechanical calculating machine. Today he is best known as the inventor of the computer.

* Minion the footman is alluding to Babbage's fraught relationship with government grants.⁸



✳ Babbage on Babbage, quoted from his pamphlet *The Exposition of 1851* [sic].⁹

✳ “To the ordinary Englishman, Mr. Babbage’s name merely suggests a hazy conglomeration of calculating machines and street-musicians,” writes L. A. Tollemache in an 1873 edition of *Macmillian’s Magazine*. It is to this happy state that I wish to return ordinary people of all nationalities.

✳ At thirteen, Ada became obsessed with flying machines, drawing diagrams and dissecting crows’ wings.

✳ Sixteen-year-old Ada messed around with her shorthand instructor, although “not to the point of complete penetration connexion” [sic] according to legal papers drawn up for her marriage. It is impossible for the imagination not to seize upon the question: Young aristocratic ladies learned shorthand? Why?¹⁰



✳ Ada's dialogue in the top panel from a 1834 letter to tutor Dr. William King (a clergyman who also sent her sermons; he suggested mathematics to Lady Byron as a subject that could "not possibly excite any objectionable thoughts"). Ada began to look for her own instructors, rapidly outgrowing her mother's old conservative mathematicians. King admitted, "You will soon puzzle me with your queries."

✳ Also to W. King, on Euclid: "I do not consider that I know a proposition, until I can imagine to myself a figure in the air, and go through the construction without any book."

✳ Ada to her mother, 1843: "I once told you that I have an ambition to make a compensation to mankind for [Byron's] misused genius. If he has transmitted to me any portion of that genius, I would use it to bring out great truths & principles. I think he has bequeathed this task to me!"



* Mary Somerville (1780–1872), after whom Oxford’s first women’s college was named, was an illustrious science writer and mathematician. She was a close friend of both Lovelace and Babbage, and corresponded with Lovelace on more advanced mathematics. In many ways an inverse of Lovelace, Somerville was forbidden from studying mathematics as a child, as her parents feared her female body would be unable to cope (Augustus De Morgan was to express the same fears about Ada decades later). Somerville in her memoirs quotes her father: “We must put a stop to this, or we shall have Mary in a straight-jacket one of these days.” She snuck candles into her bedroom to study in secret.¹¹

June 5th, 1833



...THE ELEMENTS WHICH WE REQUIRE FOR EXPLAINING A NEW CLASS OF FACTS ARE ALREADY CONTAINED IN OUR SYSTEM...

...VENTURE TO ASSUME THE PHYSICAL EXISTENCE OF THE EXTERNAL LINES OF MAGNETIC FORCE...

...IF THE RATIO OF ITS ANGULAR VELOCITY OF ROTATION TO ITS ANGULAR VELOCITY IN ITS ORBIT...

...THE QUESTION UNDOUBTEDLY IS, OR SOON WILL BE, NOT WHETHER OR NOT WE SHALL EMPLOY NOTATION IN CHEMISTRY, BUT WHETHER...

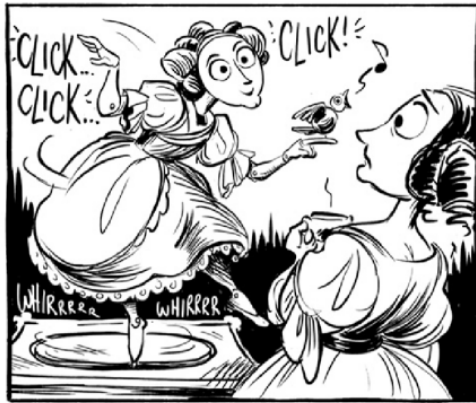
...THE LEPADIDAE, OR PEDUNCULATED CIRRIPEDES, HAVE BEEN NEGLECTED UNDER A SYSTEMATIC POINT OF VIEW...

...THE ACTIONS OF THE WAVES OF THE AETHER ON THE PARTICLES OF A MEDIUM THROUGH WHICH THEY ARE PROPAGATED...

...NEW METHOD OF RECORDING THE INDICATIONS OF METEOROLOGICAL...

...THE ORGAN OF "MARVELOUSNESS" IS VERY PRONOUNCED ON THE SKULL...

✳ Charles Babbage was famous for the parties¹² he held in his enormous London mansion, attended by hundreds of the luminaries of the day. "All were eager to go to his glorious soirees," wrote the journalist Harriet Martineau. Babbage's friend Mrs. Andrew Crosse memoirized, "One of three qualifications were necessary for those who sought to be invited—intellect, beauty, or rank—without one of these you might be rich as Croesus and yet be told you cannot enter here." (Babbage had innumerable virtues, but even his biggest fan [me] must admit he was a crashing snob.) All the people pictured above were friends of Babbage's, though I doubt they were ever all at a party at the same time!



✳ A notable resident of Babbage's parlour was a silver automaton:¹³ "... an admirable *danseuse*, with a bird on the for finger of her right hand, which wagged its tail, flapped its wings, and opened its beak. This lady attitudinised in a most fascinating manner. Her eyes were full of imagination, and irresistible."

✳ Babbage's dialogue adapted from his autobiography.

✳ The other clockwork occupant of Babbage's parlour was the fragment of his Difference Engine No. 1, made in 1832. This mechanical calculator was the only working device he completed, and even that was only a small part of the projected design for a huge machine for calculating and printing mathematical tables. You can visit this beautiful object in the Science Museum in London. A complete Difference Engine was finally built from Babbage's plans in 2000.



✧ Ada Byron saw the Difference Engine model at one of Babbage's evening parties soon after their first meeting;¹⁴ Sophia De Morgan (wife of her tutor Augustus De Morgan) was with her and recalls: "I well remember accompanying her to see Mr. Babbage's wonderful analytical engine [*sic*—she's mixing up the Difference Engine with the Analytical Engine, which device we shall meet shortly]. While other visitors gazed at the working of this beautiful instrument with the sort of expression, and I dare say the sort of feeling, that some savages are said to have shown on first seeing a looking-glass or hearing a gun—Miss Byron, young as she was, understood its working, and saw the great beauty of the invention."

✧ Babbage's favorite demonstration of his Engine model was setting it to alter the rule for a series it was calculating after a specific interval of cycles. He uses this feature as an analogy in a highly unconvincing defense of the veracity of biblical miracles¹⁵ in *The Ninth Bridgewater Treatise*.



IT CAN TABULATE ACCURATELY AND TO AN UNLIMITED EXTENT ALL SERIES WHOSE GENERAL TERM IS COMPRISED BY THE FORMULA $\Delta^7 U_x = 0!!!$



INDEED, ALL OTHER SERIES WHICH ARE CAPABLE OF TABULATION BY THE METHOD OF DIFFERENCES!!



EXACTLY!



OH LOOK, WE'RE PRESENT FOR THE INVENTION OF THE GEEK!

THIS BIT WAS PARTICULARLY CLEVER OF ME!

* Babbage was forty-two and Lovelace eighteen when they met. They became close lifelong friends;¹⁶ he lent her the plans for the Difference Engine soon after their first meeting¹⁷ and he enjoyed sending her mathematical puzzles.

* Lovelace's dialogue from her Notes to the *Sketch of the Analytical Engine*. The Difference Engine was intended not to figure out a specific result, but to produce a series of thousands of iterations of one type of addition (to the formula Lovelace quotes above), and ultimately to print out the enormous books of tables used by navigators, engineers, accountants, etc., before the days of calculators. The "method of differences" is a way of reducing some types of maths to simple additions, such as can be done mechanically by turning gears.

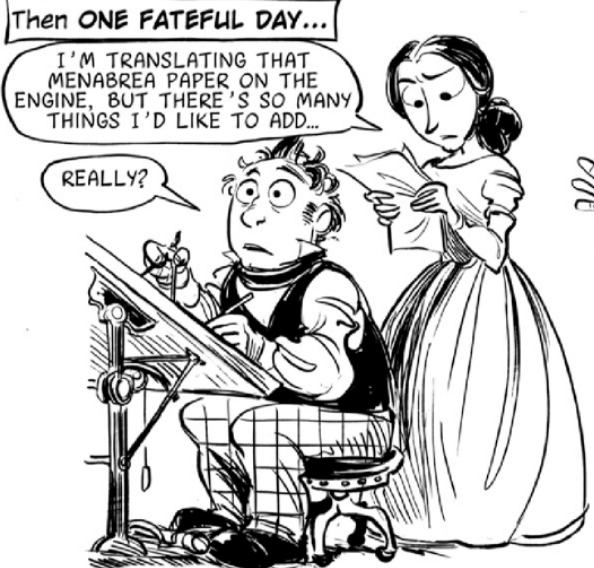
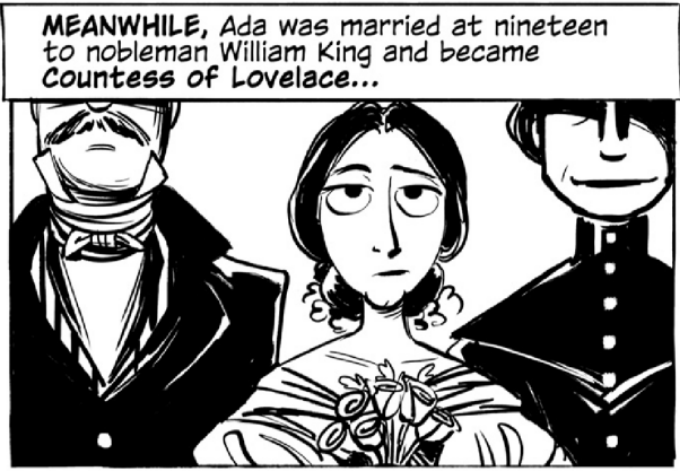


Around the same time Babbage met Lovelace, he was developing a remarkable extension of his mechanical calculator: a way to control it automatically with punched cards. A machine he called...



✳ The name Difference Engine tends to stick in people's heads and sounds better in comic books, but Babbage is really known for his later and less sexily named Analytical Engine.

✳ The Analytical Engine was inspired by the punch-card-pattern Jacquard loom; Babbage conceived of it the same year he met Ada. There are thousands of pages of Babbage's notebooks and plans for it. The machine was in a state of constant flux, as Babbage was continually amending, improving, adding on, and taking off bits of the mechanism. With memory, processor, hardware and software, and an intricate series of self-activating feedback loops, it was essentially a modern computer, except for being composed of cogs and levers and powered by a steam engine.



* William King (no relation to the sermonizing mathematics tutor) was thirty when he married Ada. ¹⁸

* Babbage recalls in his autobiography: "The late Countess of Lovelace informed me that she had translated the memoir of Menabrea. I asked why she had not herself written an original paper on a subject with which she was so intimately acquainted? To this Lady Lovelace replied that the thought had not occurred to her. I then suggested that she should add some notes to Menabrea's memoir; an idea which was immediately adopted." An original scientific paper by a woman would have been very unusual, but there was precedent for women to write translations and summaries of men's work. Lovelace seems to have had ambitions to be the successor to her old friend and teacher Mary Somerville in this capacity.

* Babbage called Ada "that Enchantress who has thrown her magical spell around the most abstract of Sciences" and "youthfull fairy" in an adorable letter to Michael Faraday (in [Appendix I](#) on page 274).



So it was that in 1843, Ada Lovelace wrote the first paper on computer science, including the earliest complete computer program...

✳ Lovelace added seven footnotes to her translation of Menabrea’s *Sketch of the Analytical Engine*; they are a little over two and half times longer than the original paper—roughly the proportion of footnote to comic on this page. Together they take up 65 pages of the September 1843 edition of Taylor’s *Scientific Memoirs*, a journal dedicated to publishing English translations of work from continental Europe.

The Menabrea paper is evidently a pretty straight transcript of Babbage’s lecture, and outlines the basic structure of the Engine. It is in Lovelace’s Notes that can be found the most interesting proto-versions of many modern computing ideas—loops, if-then statements, the separation of hardware and software, and most radically, the concept of general-purpose computing: that is, the potential for the engine to go beyond the solving of numerical equations, and to manipulate any kind of information.

The Notes, like Menabrea’s original paper, also contain several mathematical “programs,” which look like big tables of numbers, breaking down the steps by which the machine would process a complicated series of calculations. Babbage himself had naturally sketched out simple programs for his machine; some small programs also exist by one of Babbage’s assistants (who is notable for his very tidy handwriting, unlike either of our protagonists). It was Lovelace, however, who seems to have worked out the most elaborate and complete program in the paper, and she was the first to publish; for this reason, she is sometimes known as the “first computer programmer.”

I say “seems,” as there is considerable controversy over how much of the Notes is Lovelace and how much is Babbage. Their correspondence over the nine-month period of the writing of the Notes, while extremely entertaining, is not as helpful as one would think in clearing this up, being full of in-jokes, allusions, and “let’s talk about it on Tuesday”s. Anything involving hardware is certainly Babbage’s; while what Babbage called the “philosophical view” of the Engine, as well as the final forms of the programs, would be Lovelace’s department.

In a sense the stubborn, rigid Babbage and mercurial, airy Lovelace embody the division between hardware and software. Babbage’s focus was on what we would call the hardware—the clockwork network of intricately intertwined levers, cogs, cards, pegs, racks, etc., ad infinitum, making up the Engine. His own proudest achievement was when he came up with a scheme to shave fractions of a second off the (imaginary) mechanism used to perform a carry (it is indeed *extremely* clever; there is a diagram later on in this book). Lovelace, on the other hand, tended to ignore the hardware with an aristocratic handwave (referring, for instance, to her idea of adapting the machine for producing symbolic results as well as numerical ones “easy, by means of a few simple provisions”!); she was all about the software; in reading her paper the literally tons of metal that would be performing the operations dissolve into an abstraction of data.

It’s not clear why Babbage himself never published anything other than vague summaries about his own machine. He published volumes of ramblings on every subject under the sun except that of his life’s work; everything we know of the Analytical Engine is from Lovelace’s paper and by deciphering the volumes of notebooks and diagrams left by Babbage. From my amateur psychologist armchair down here in the footnotes I would guess that he was eternally waiting for his imaginary Analytical Engine to reach complete perfection before risking it before the public. A fatal habit! Whatever the reason, it was Lovelace’s Notes, and her philosophy, that carried the vision of a general-purpose computing machine forward into the future.



✧ What was certainly Lovelace's original realization was to be the essential root of computer science: that by manipulating symbols according to rules, *any* kind of information, not only numbers, can be operated on by automatic processes.

[The Engine] might act upon other things besides number, were objects found whose mutual fundamental relations could be expressed by those of the abstract science of operations, and which should be also susceptible of adaptations to the action of the operating notation and mechanism of the engine. 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.

Ada proposed an intellectual partnership.



CHARLES BABBAGE,
I SHALL PUT
MY BRAIN UNDER
YOUR SERVICE!!

YOU WILL BUILD
THIS ENGINE!

AND I...



...SHALL BE ITS
HIGH PRIESTESS.

But dark forces, alas, were at work in Lady Lovelace...

The Byron Devil began to manifest itself, and Ada was surrounded by rumors of madness, gambling, addiction, and a "poetical appearance"...in spite of all Lady Byron's precautions.



NO ONE KNOWS WHAT
AWFUL ENERGY AND POWER
LIE YET UNDEVELOPED IN
THAT WIRY LITTLE
SYSTEM OF MINE!



Through it all,
Lovelace and
Babbage remained
the greatest of
friends.



* "I had better continue to be simply the High-Priestess of Babbage's Engine, & serve my apprenticeship faithfully therein" (Lovelace to her mother, 1843). The line with "Awful energy and power" is from a letter from Lovelace to Babbage, 1843.

* Lady Nevill, in her memoir *Under Five Reigns*, writes, "Lady Lovelace was, I have heard said, somewhat poetical in her appearance. I do not exactly know what such a description may have meant." From my own knowledge of Lady Lovelace I hazard this meant she was depressed-looking and extremely badly dressed.

* Our heroes are silhouetted walking on the terrace of the Lovelace estate of Ashley Combe in Somerset, named the Philosopher's Walk in Babbage's honor. Lovelace to Babbage, 1849: "You can have a pony all to yourself, & never need walk a step except on the terrace—the philosopher's walk."¹⁹

Sketch of the Analytical Engine with Notes by the Translator was the only paper published by Ada Lovelace. She died of cancer a few years after its publication, aged thirty-six.

Babbage never did finish any of his calculating machines. He died at seventy-nine, a bitter man.

The first computers were not built until the 1940s.

...but wait!

That ending to the story of Lovelace and Babbage is only **ONE** of the infinite array of possible outcomes, occurring on the more boring worlds that are part of...

THE MULTIVERSE!



The particular universe in which the rest of this book takes place is an artificially created **Pocket Universe** with some peculiar properties. Its genesis took place under the following circumstances:



...thus generating the Pocket Universe in which Lovelace and Babbage live to complete the Analytical Engine, and naturally use it to **HAVE THRILLING ADVENTURES and FIGHT CRIME!!**



* Lovelace, Babbage, and the Difference Engine, though thwarted in their own time, in ours play a large part in the alternate-history cosmos/geek subculture/fabulous design aesthetic known as Steampunk. It's a bit ironic that Lovelace and Babbage find themselves icons of so fashion-conscious a scene as Steampunk, as they are well documented as being two of the worst-dressed people of the nineteenth century. As one source says, "Lady Ada [. . .] was extremely careless in her dress, not looking so well-appointed as her maid" (*Nathaniel Hawthorne and His Wife*, vol. 2, Julian Hawthorne, 1884, p. 139). And another: "Babbage . . . dressed quaintly . . ." (*The Romance of a Pro-Consul*, James Milne, 1899, p. 42).

Although they do have an idiosyncratic definition of 'crime'.



ENDNOTES

1. George Gordon, Lord Byron, unexpectedly inherited the Byron title after the deaths of his great-uncle William “the Wicked Lord” Byron and his father, “Mad Jack” Byron. “Poet” nowadays implies something rather modest and dainty—Byron wrote epic novels in verse, smash-hit bestsellers full of brilliant scathing wit and brooding misunderstood antiheroes. Add his extraordinary good looks and charm; a fairy-tale elevation to the peerage from boyhood poverty; moody, eccentric behavior; and a predilection for lots and lots of all possible varieties of sex; and Byron was famous enough for ten modern celebrities put together. You’d have to combine Elvis with the chic political radicalism of Che Guevara, and the intellectual stature tinged with ugly sexual rumor of a Roman Polanski, to approach the fame of Byron: Lady Byron coined the term “Byronmania” for the cult that surrounded her husband.

It’s not easy being the daughter of a celebrity mad genius deviant sex god, and Ada Byron was monitored by the entire country, it sometimes seemed, for signs of madness, genius, and deviant sex. She would gratify expectations on all of the above. ✨

2. Having multiplied, the Byrons divided hahaha . . . ahem. Lady Byron left her husband when Ada was a month old; Byron left the country shortly after under a cloud of scandal. Their separation was so bitter and notorious that Harriet Beecher Stowe of *Uncle Tom’s Cabin* fame wrote a ferocious polemic in defense of Lady Byron, fifty years later and after everyone was dead. Sample of he said/she said: on the night she gave birth to Ada, Annabella reported that her unstable husband, raging in the room below, was throwing wine bottles and breaking them against the ceiling. Byron’s friend John Hobhouse retorts that this was ridiculous,

inkling of the colossal role his bitterness over government funding played in his life. As you might imagine, a full history of government funding of a vaporware IT project is both tedious and complicated, but, in brief: The British government in the 1820s provided Babbage with a series of fairly enormous grants to construct a Difference Engine, a large machine to calculate and print the books of mathematical tables. Babbage and a crew of engineers began work and built a model, but what with one thing and another (Babbage was a brilliant inventor but a truly awful project manager), years passed and no Difference Engine seemed to be appearing. In the meantime, Babbage came up with the idea for the Analytical Engine, which he quite rightly viewed as superseding the Difference Engine, and began to devote his colossal brain to that. The government, fed up, stopped funding and wrote off the whole mess, after having somehow spent £17,000 on a nonexistent calculator: the price, as was often pointed out, of two battleships. After this, Babbage naturally found it impossible to convince anyone to fund his Analytical Engine.

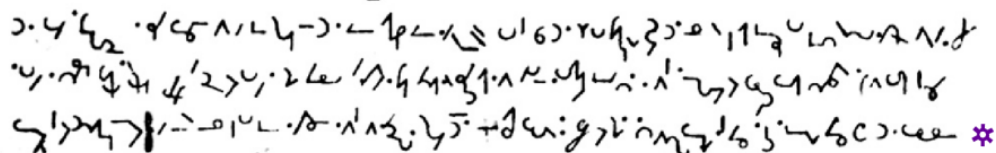
Babbage was hypersensitive to the smallest hint that he had ever used government money unethically for himself or his Analytical Engine and wrote many furious denials to various publications. His soreness was also to lead to a very odd fight between him and Lovelace, which will appear later in this book. I sympathize; development hell has exasperated far more easygoing souls than that of Charles Babbage. ✨

9. The persnickety [*sic*] which I am obliged to use after the title is because *The Exposition of 1851* concerns the Great *Exhibition*; as *Mechanics Magazine* put it in their grumpy review, “The pedlar sort of use which Mr Babbage has made of the ‘Exhibition’ (or ‘Exposition’ as with idle singularity he persists in calling it) is the more to be regretted, since there is nothing in all that part of the book which relates to the Exhibition, which is at all calculated to raise his reputation; or rather, let us say, since to *raise* it is impossible, which is worthy of it.”

That it was “impossible” to raise Babbage’s reputation may sound surprising, as he is often described by people who like a good underdog-inventor story as an obscure object of mockery. Far from it—the wealthy and celebrated Babbage was one of the most famous men of his time, his name a byword for genius; a bit like one of his successors as Lucasian Mathematics Chair, Stephen Hawking. One contemporary referred to Babbage as more famous than Newton: “It has been the fortune of Mr Babbage, who sits in Newton’s Lucasian chair, to surround himself with fame of a more popular kind than that of his great predecessor, by the project of a calculating engine” (*Parallel History*, Philip Alexander Prince, 1843). ✨

10. I’m indebted to Leah Price in the *London Review of Books* for a picture of Victorian shorthand as the tool of “a counter-culture of early adopters”—journalists, scientists, autodidacts—with almost a gadgetlike quality, a way to handle the increasing flood of information from print and public lectures. With its progressive, scientific associations it would certainly have been a natural fit for Lovelace’s education. Lovelace often refers to “copying out” passages from books of science she borrowed from friends (such books being rare and expensive, she couldn’t afford that many of her own), presumably using shorthand. Shorthand of this period, by the way, has an intriguingly codelike look—like this from Thomas Gurney’s *Brachygraphy: or, An Easy and Compendious System of Short-hand*, 1835:

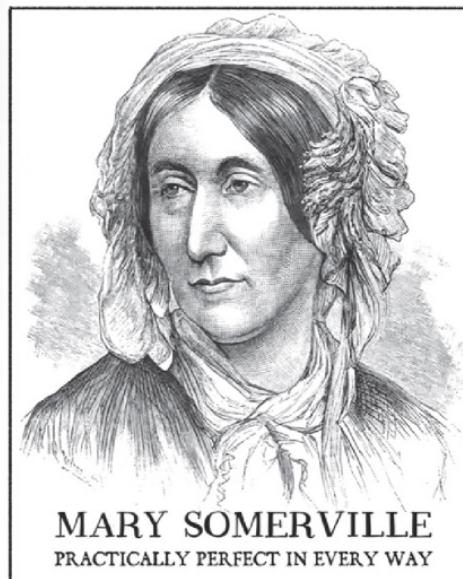
His MAJESTY’S first Speech to both Houses of Parliament.



11. Mary Somerville’s studies were delayed even further—her first husband didn’t approve of women learning mathematics, so she wasn’t able to conduct serious work until he died and she married a more sympathetic man. Her first work wasn’t published until she was over fifty; but she made up for it by writing her last one, *On Molecular and Microscopic Science*, when she was eighty-five years old. Her transformative translation of Pierre-Simon Laplace’s fiendishly complex *Mechanism of the Heavens*, like Lovelace’s later work on the Analytical Engine paper,

was full of extended commentary and diagrams. Laplace himself told her, “There have been only three women who have understood me. These are yourself, Mrs. Somerville, Caroline Herschel and a Mrs. Greig of whom I know nothing.” Somerville’s first husband was Mr. Greig, so she was actually two of the three women! ✨

12. Another visitor (one Sir Frederick Pollock, author of *The Law of Torts*, if you must know) recalled: “Certainly one always met a great variety of notable people at them and of all kinds—politicians, scientific and literary notabilities, actors, and persons of mere fashion and rank. There were always objects of scientific novelty or importance to be seen in the drawing-rooms, and Babbage was an active and ubiquitous host. The only refreshments served used to be tea and slices of brown bread and butter of exceptional excellence.” (I assume, or at least I *hope*, it was BYOB; I at least would need a stiff drink to talk to half the people at Babbage’s parties.) ✨



13. The complete story of Babbage’s Silver Lady, from his autobiography:

During my boyhood my mother took me to several exhibitions of machinery. I well remember one of them in Hanover Square, by a man who called himself Merlin.* I was so greatly interested in it, that the Exhibitor remarked the circumstance, and after explaining some of the objects to which the public had access, proposed to my mother to take me up to his workshop, where I should see still more wonderful automata. We accordingly ascended to the attic. There were two uncovered female figures of silver, about twelve inches high.

One of these [. . .] was an admirable *danseuse*, with a bird on the fore finger of her right hand, which wagged its tail, flapped its wings, and opened its beak. This lady attitudinised in a most fascinating manner. Her eyes were full of imagination, and irresistible. [. . .]

Her fate was singular: at the death of her maker she was sold with the rest of his collection of mechanical toys [. . .] and it seems to have been placed out of the way in an attic uncovered and utterly neglected. On [her] sale by auction I [. . .] met again with the object of my early admiration. [. . .] I myself repaired and restored all the mechanism of the Silver Lady, by which title she was afterwards known to my friends. I placed her under a glass case on a pedestal in my drawing-room, where she received, in her own silent but graceful manner, those valued friends.

No one knows what became of the Silver Lady, but you can see the elegant movements of a clockwork Silver Swan by Merlin at the Bowes Museum near Durham, or indeed on YouTube. Babbage must have been very young—Merlin died when Babbage was eleven. ✨

*He called himself Merlin because that was his name—John Joseph Merlin (1735–1803) was a Belgian inventor living in London who specialized in silver automata and elaborate clocks. He made improved keyboards for musical instruments and an improved barrel organ, the instrument that was to haunt Babbage’s later life. He also invented roller skates:

One of his ingenious novelties was a pair of skaites contrived to run on wheels. Supplied with these and a violin, he mixed in the motley group of one of Mrs. Cowley’s masquerades at Carlisle House; when not having provided the means of retarding his velocity, or commanding its direction, he impelled himself against a mirror of more than five hundred pounds value, dashed it to atoms, broke his instrument to pieces and wounded himself most severely (“Concert Room and Orchestra Anecdotes,” Thomas Busby, 1805).

14. Ada first met Babbage* at a dinner party at Somerville's house; she visited Babbage in his home some weeks later. ✱

15. Babbage launched his theory of miracles—that a hacker-God could write a programming exception to the normal running of the universe in advance of Creation—in *The Ninth Bridgewater Treatise*. His God-the-Programmer view of the Universe baffled most and amused some critics—“we might venture to suggest, that there is something too much like an attempt to establish a kind of analogy between the Framers of the world and the framer of the calculating machine” (*The British Critic, Quarterly Theological Review, and Ecclesiastical Record*, 1837). ✱

16. Babbage and Lovelace were often paired in period anecdotes, some of which you can find in the appendix. They had similar personalities—egocentric, naive, enthusiastic, and obsessive—and never quite fit in with stuffy Victorian society. So they were bound to either kill each other or become each other's biggest fans. Some may wonder—was there anything romantic between them? There's a good reason to think that there *was*, and that reason is, it's extremely fun to think about. Sadly that's the *only* reason, as there isn't a hint of romance in any of their correspondence with each other, and they weren't exactly the subtlest people in the world. Of course, there was that time Babbage wrote to her that he would visit her and her husband and ponder “that horrible problem—the three bodies,” but even I think that's a stretch. ✱

17. I lie; it was Babbage's son Herschel who lent her the plans. It's hard to know what sort of detail to cram into the footnotes. ✱

18. Ada's relationship with her husband, like everything else in her life, is murky, contradictory, and described in wildly different ways by every biographer. Certainly many of her letters to him are highly, even drippingly, affectionate, but then as a Victorian woman she was legally a complete dependent on her husband and there was a formidable framework of social machinery to compel the performance of the loving wife. Lord Lovelace himself gives an impression of humorless stuffiness, the very pattern of the Victorian patriarch. There are hints he may have been violent to his family; his daughter-in-law described him as “more feared than loved by family and friends.” We can be fairly sure that Ada Lovelace had at least one affair; biographers, however, have shown a strange disinterest in the question of whether Lord Lovelace was also chaste to his marriage vows. On the bright side, he always supported and encouraged Ada in her mathematical studies.

Lovelace's three children were all weird, fascinating, and seem to have inherited their mother's restless spirit. Byron, the eldest, ran away from home at seventeen after his mother's death and disappeared until his own early death of tuberculosis at twenty-six, when it turned out he had been working as a ship's carpenter. The title passed to second son Ralph, a passionate mountain climber vaguely described as “eccentric” by his contemporaries, who wrote an odd book full of family letters defending his grandmother's decision to leave Lord Byron. I have an irrational dislike of Ralph from his habit at age twelve, complained of by Ada in an 1843 letter, of jerking his pony's reins when he was angry.

Ada's only daughter, Anne, lived a quiet and demure existence until she was thirty, whereupon she married a poet, Sir Wilfred Blunt, and began a life of wild adventure. She was the first Western woman to cross the Arabian desert, and like her mother she was a passionate horsewoman. She is a superstar in the history of the Arabian horse—90 percent of Arabian horses in Europe and the Americas can trace their descent to the stock she brought back from the Middle East. Her sister-in-law's memoir paints an extraordinary picture of Anne—“a

*It's possible Babbage had known her as a child as well—their old friend Mrs. Crosse writes, “Babbage was very fond of talking of Byron's daughter; to him she was always ‘Ada,’ for he had carried her in his arms as a child, and he was her friend and counsellor when she was Lady Lovelace.”

I should add that as no one has found a document definitively showing that Babbage knew Ada as a child, some scholars think either Babbage or Mrs. Crosse is wrong or lying here. For my part I think this sort of paranoia is weird—why would they lie? This is why I'm not a scholar.

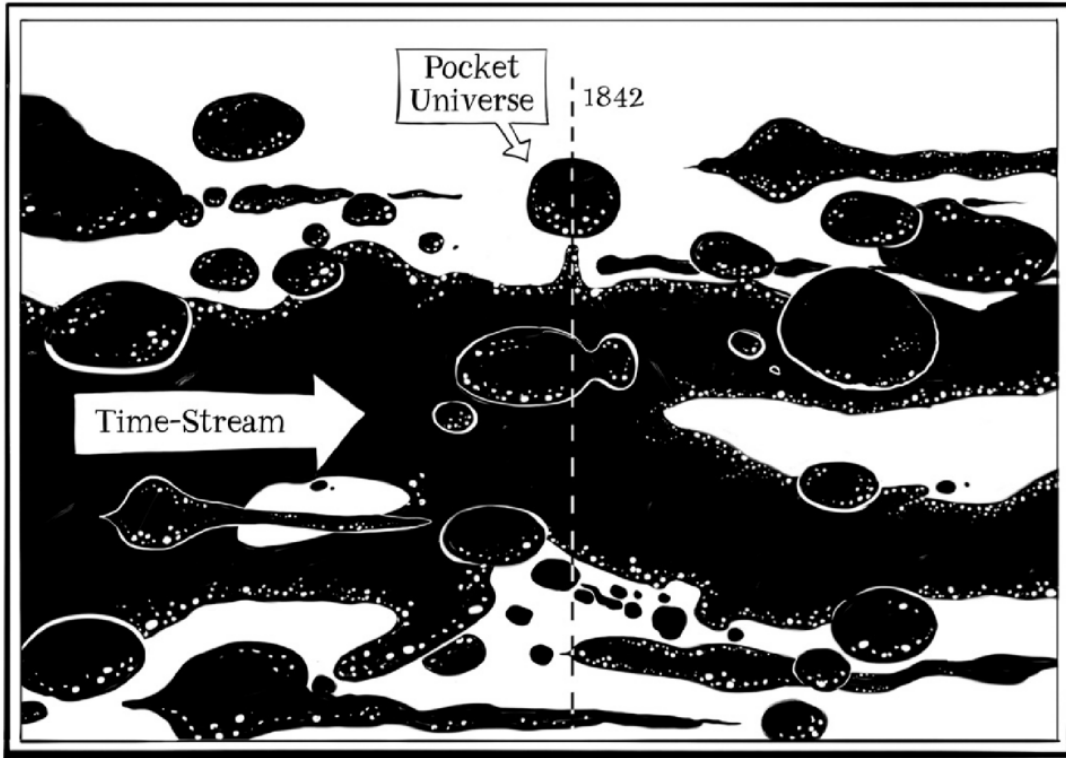
remarkable long-distance runner,” “she habitually rode a buck-jumper, which afterwards ‘put down’ the crack Australian rough-rider of the day. Perhaps this was her proudest achievement.” She definitely needs her own comic book. ✱

19. This letter goes on—“Don’t forget the new cover you promised to bring for the book. The poor book is very shabby, & wants one.” This is one of several frustrating hints in the last few years of their letters about a “book” sent back and forth between Babbage and Lovelace, in which they both appear to have been writing. Speculations as to what was in the “book” range from a book on the Analytical Engine, to a book of bets on horse races, as in a bookie’s book. I guess we’ll never know.

Ada, Countess of Lovelace, contracted cancer of the womb a few years after the publication of *Sketch of the Analytical Engine*. “I do so dread that horrible struggle, which I fear is in the Byron blood. I don’t think we die easy,” Lovelace wrote to her mother in October 1851. As usual, Lovelace was eerily prescient. She battled the disease for fourteen agonizing months before dying two weeks shy of her thirty-seventh birthday. Florence Nightingale wrote of her death to a friend, “They said she could not possibly have lived so long, were it not for the tremendous vitality of the brain, that would not die.” ✱



The Pocket Universe



Our Local Multiverse

In his *Ninth Bridgewater Treatise*, Babbage comes tantalisingly close to speculating on the possibility of infinite alternate universes with different laws of physics:

Had that law [of gravity] been other than it is— had it been, for example, the inverse cube of the distance, it would still have required an equal expense of genius and of labour to have worked out its details. But, between the laws represented by the inverse square, and the inverse cube of the distance, there are interposed an infinite number of other laws, each of which might have been the basis of a system[...] Man has, as yet, no proof of the impossibility of the existence of any of these laws. Each might, for any reason we can assign, be the basis of a creation different from our own.

The Pocket Universe in which this comic takes place is a creation quite different from our own and naturally obeys its own distinct laws.

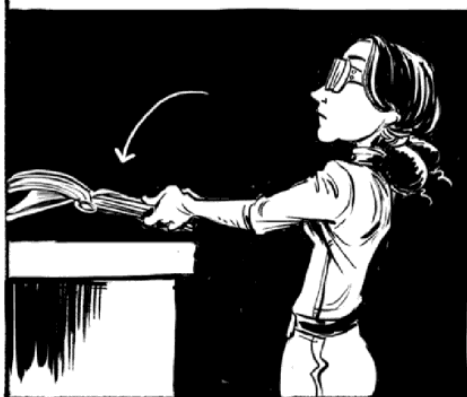
ONCE YOUR POSITION IN THE SECOND DIMENSION IS SECURE, IT IS POSSIBLE TO PROCEED INTO THE

FIRST DIMENSION!

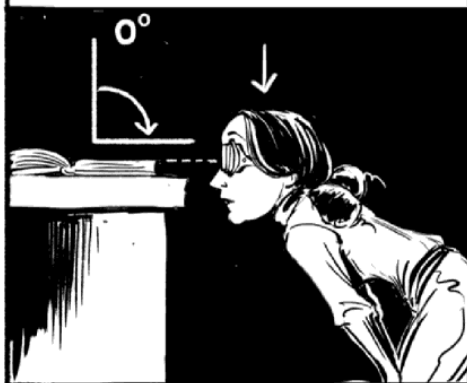
TO CONDUCT THIS HAZARDOUS OPERATION, IT IS BEST TO WEAR PROTECTIVE CLOTHING, AVOIDING CUMBERSOME GARMENTS THAT MAY BE CAUGHT ON PROJECTING **THREE-DIMENSIONAL ANOMALIES!**



Position the comic on a perfectly horizontal surface.



Align gaze at precisely 0° of the angle of the comic.



COMIC AS VIEWED IN THE FIRST DIMENSION (SIMULATION*)

* A small trace of the second dimension is necessary for the simulation to exist on this page.

Meanwhile...

...in a
Pocket Universe...





* The notorious and mysterious Person from Porlock disrupted Samuel Taylor Coleridge in the composition of “Kubla Khan: A Vision in a Dream,” according to Coleridge himself.¹ A lengthy queue of proposed candidates for the Person from Porlock trails out of the door to Ash Farm in Devon, where Coleridge wrote “Kubla Khan,” ranging from opium dealers to aliens. I believe Ada Lovelace is the *best* candidate, as not only was she specifically raised to destroy all poetry, but she was in fact literally a person from Porlock—it is a short walk from the Lovelace estate,² and Ash Farm



itself is suspiciously a mere three kilometers away. Some may object that she was born eighteen years after the composition of the poem, but this anomaly is easily explained by a particularly strong wobble in the circular time-like loops in the Pocket Universe.

* Lovelace might be expected to be up to date on the latest mathematics of probability as relates to life insurance, having been instructed by William Frend, Augustus De Morgan, and Charles Babbage,³ all of whom consulted for actuarial firms. Babbage's first book, in fact, was *A Comparative View of the*



Various Institutions for the Assurance of Lives in 1826, which I read (well, skimmed) in my tireless quest for more accurate comics. I note that Babbage couldn't even write about life insurance without opening with a career-torching rant denouncing everyone in the industry.

✧ A “micromort” is a measure of risk of death. Consider a bag filled with one million balls—some green, some purple. Your odds of dying on any given day can be thought of as your chances of randomly selecting a purple ball: one micromort. Skydiving, for instance, adds seven Purple Balls of Death or micromorts to your daily bag (from the Carnegie Mellon Center for the Study and Improvement of Regulation; Purple Balls of Death is their term, I swear).

✧ After writing this gag I was taken aback to discover a 2003 study, “The Cost of the Muse: Poets Die Young” (James C. Kaufman in *Death Studies*, issue 27), which found that poets really do die significantly younger than other writers. Writers of poetry die on average six years earlier than writers of nonfiction; and writers themselves die younger than normal people by two and a half years. I did some actuarial statistics of my own and calculated that the average lifespan of a major Romantic poet was 47.2 years (John Keats and Byron really throw off the curve, by dying at twenty-five and thirty-six). Determining by how much poetry was shortening their lifespan depends on if you compare them to the average Englishperson in 1830 (47.1 years), or to the average Englishperson in the *top 10 percent by income*, which was fifty-one years. Coleridge beat the odds, in any case; he lived to sixty-one.

COMMAND PERFORMANCE!!!

LOVELACE & BABBAGE

VS.

by the Grace of GOD Her Majesty the

CLIENT!



Her Majesty to be accompanied by His Grace the
DUKE OF WELLINGTON, KotB., KotG., F.R.S., KGC, etc.

With amusing scenes performed by the Company

* Crash of the Calculi. * Percussive Maintenance. * Mr. Babbage's
Remarkable Cheese Story. * An Encroachment of Footnotes. *

The performance to conclude with the Lively FARCE,
PRIMARY DOCUMENTS.

V.



R.



Drawn by A. E. Chalon, F.R.S.

Engraved by H. T. Ryall.

Lithograph of Queen Victoria on the occasion of her marriage, 1840. If it looks a little familiar, it's because it is the work of A. E. Chalon, the same celebrity kitsch artist who did the portrait of Lady Lovelace on page 39.