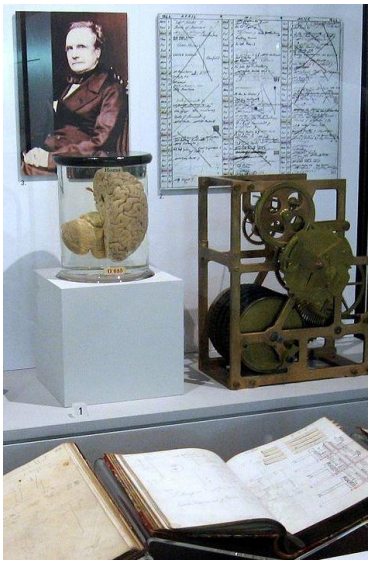
Dec. 26th

Charles Babbage

Born: Dec. 26, 1791;

London; Probably at 44 Crosby Row, Walworth Road
Died: Oct. 18, 1871

Babbage's Analytical Engine [Dec 23] originated the idea of a programmable computer, inspired by his earlier designs for a Difference Engine [June 14] for calculating polynomial functions. Neither machine was built in his lifetime, but see [four entries forward]. Fortunately, he gave fairly detailed descriptions of them in his 1864 autobiography, "Passages from the Life of a Philosopher", and his son, Henry, supplied more technical information in "Babbage's Calculating Engines" in 1889. The book collected all of his father's writings on the machines, together with previously unpublished plans and notebooks.



Babbage's brain at the London Science Museum. Photo by Marcin Wichary. CC BY 2.0.

Babbage dabbled in many areas of Victorian engineering: he designed cow-catchers for railway engines, an automaton for playing tic-tac-toe [Aug 25], and a mail system for delivering canisters along wires strung between towers. He invented a light flashing signaling system for ships, and shoes for walking on water.

He had a reputation for being somewhat eccentric: he once counted all the broken panes of glass in a factory, and published a paper about it, noting that 14 of the 464 breakages were caused by "drunken men, women, or boys". He once baked himself in an oven at 265°F (130°C) for four minutes "without any great discomfort" to "see what would happen." He calculated the chances of a man rising from the dead, and directed a ballet featuring colored lights. Perhaps most famously, he suffered a long-running feud with London's organ grinders [July 25].

There is a Babbage Crater on the moon, a Babbage River in the Yukon, and Babbage Mountains in Australia. Half of Babbage's brain is preserved at the Hunterian Museum in the Royal College of Surgeons in London. The other half is on display across town in the Science Museum. Do the two pieces fit together, like a jigsaw?

John Horton Conway

Born: Dec. 26, 1937;

Liverpool, UK
Died: April 11, 2020

Although Conway worked in many areas related to number theory and recreational math, he's perhaps best known to computer scientists for his "Game of Life" cellular automaton, which was popularized in an article by Martin Gardner [Oct 21] in the Oct. 1970 issue of *Scientific American*. Since then, "Life" has spawned hundreds of programs, web sites, and articles.

Gardner actually wrote quite frequently about the recreational aspects of Conway's work. For instance, he discussed Conway's game of Sprouts (July 1967), Hackenbush (Jan. 1972), and his angel and devil problem (Feb. 1974).

Another point of contact with computing is through his discovery of a new class of numbers, both infinitely large and infinitesimally small, called "surreal numbers", which popped up while Conway was studying Go. They were first named in Donald Knuth's [Jan 10] 1974 book "Surreal Numbers: How Two Ex-Students Turned on to Pure Mathematics and Found Total Happiness".

When Conway first booted up his computer, it generated ten random dates (e.g. 5/3/2020, 29/4/1803) as a password test. He had to enter the day of the week for each one before the computer let him in. Using his own Doomsday rule to do the mental calculation, he could usually come up with the correct day within a few seconds.

His father was a technician in the chemistry lab at the Liverpool Institute for Boys, a school attended by Paul McCartney and George Harrison of "The Beatles" [June 25; Oct 1; Oct 8].

The Guardian newspaper described Conway as "Archimedes, Mick Jagger [Dec 7], Salvador Dali, and Richard Feynman [May 2], all rolled into one."

Joseph Sifakis

Born: Dec. 26, 1946;

Heraklion, Crete

Sifakis is one of the pioneers of model checking which aims to verify that a mathematical model of a system matches its specification. Model checking is essential in hardware design to validate safety requirements for concurrent systems.

Sifakis' lab developed the SCADE tool for checking real-time systems, which has since become a de facto standard in aeronautics. He also played a major role in the development of the BIP (Behavior, Interaction, Priority) component framework for system design.

Sifakis is a commander of the Greek Order of the Phoenix. The

phoenix symbolizes the rebirth of the Hellenic nation; it is not a secret society founded by Albus Dumbledore.

Expando-Vision

Dec. 26, 1983

John C. Dvorak, writing in *InfoWorld* magazine, described his encounter with Expando-Vision at COMDEX [Dec 3]. The gadget was attached to a TV set and flashed subliminal messages on the screen while you watched regular TV programmes.

The makers, Stimutech of East Lansing, Michigan, emphasized its self-help uses (e.g. for weight-loss and for quitting smoking), but also sold a "Sexual Invitation" module that flashed up messages of 'irresistible' seduction, such as: "Let's make love" and "Let's get naked".

Expando-Vision could run on the VIC-20 [May 00], Commodore 64 [Jan 7], or Atari 400/800 [Nov 00], but there was no Apple II version [June 5].

For more Dvorak, see [Sept 27], [April 1].

Difference Engine No. 2, Twice

Dec. 26, 1991

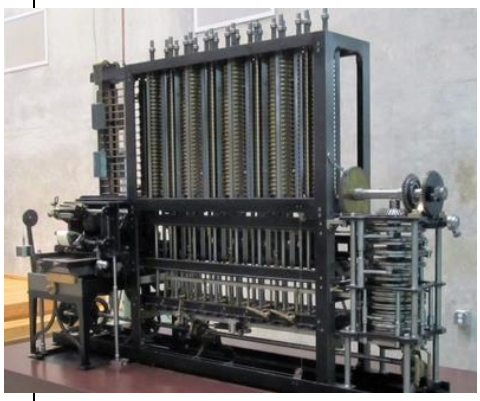
London's Science Museum put a working 2.6-ton, 4000-part Difference Engine No. 2 [June 14] on display to commemorate the 200th anniversary of Charles Babbage's birth [four entries earlier]. The project was begun in 1989 by Doron Swade, then curator of computing at the museum. Also on display was part of Babbage's unfinished Analytical Mill, and half of the great man's brain.

The engine's engineering team, led by Reginald Crick, worked from Babbage's original plans and twenty large design drawings. Crick said "There were some mistakes, but we think he was afraid of industrial espionage. We think Babbage deliberately put errors into the drawings to mislead anybody that might try to sell them."

Modern manufacturing methods were employed to build the engine but only to a level of precision possible in Babbage's time. The fact that the machine worked showed that Babbage's failure to build it wasn't due to the limitations of nineteenth-century engineering. It had much more to do with disputes with his engineer, Joseph Clement, his frequent design tinkering, and poor project management.

In 2000, Nathan Myhrvold [Aug 3] funded the construction of the engine's output unit, which can both print and create plates for use in printing presses.

Myhrvold also commissioned a second Difference Engine, which took 3.5 years to finish, including four months to get it to run reliably. It was built by a team led by Richard Horton who had taken over from Crick (who was then 80 years old).



The Difference Engine at Intellectual Ventures. Photo by Alan Boyle. (c) https://www.geekwire.com

This second engine is on display in the foyer of the Intellectual Ventures (IV) lab at 14360 SE Eastgate Way, Bellevue in Washington state. *Wired* magazine claimed that the engine was, at some point, located in Myhrvold's living room.