Columbus' Eclipse
Feb. 29 - March 1, 1504

Christopher Columbus persuaded the inhabitants of the northern shores of Jamaica to continue provisioning his ships by correctly predicting a total lunar eclipse. The eclipse was visible after sunset on Feb. 29 from most of North America, all of South America, as well as across Europe, Africa, and western Asia.

Columbus' son, Ferdinand, later wrote of the event: "with great howling and lamentation they came running from every direction to the ships, laden with provisions, praying the Admiral to intercede by all means with God on their behalf; that he might not visit his wrath upon them ..."

Columbus' prediction was probably based on one or two astronomical texts. In 1478 Abraham ben Samuel Zacuto, published his "Almanach Perpetuum," 300 pages of astronomical tables, including the first accurate table of solar declinations. This information allowed navigators to use the sun to determine their latitude, with the help of an astrolabe. The other volume, "The Ephemerides," was written by the German astronomer Johannes Müller, who went by the Latin name Regiomontanus. It contained details on the expected dates of many eclipses.

Columbus used the timing of the eclipse to calculate his longitude, but his incorrect answer persuading him that he was much further west than he was. The error was probably due to a misreading of Regiomontanus' data which gave times for mid-eclipses.

In 1885, H. Rider Haggard used the event dramatically in his novel "King Solomon's Mines", when Allan Quartermain recruits supporters from the local tribe by predicting a lunar eclipse. Mark Twain also employed it as the basis for a segment of his 1889 novel "A Connecticut Yankee in King Arthur's Court." A similar plot device was featured in the Tintin comic, "Prisoners of the Sun" from 1946.
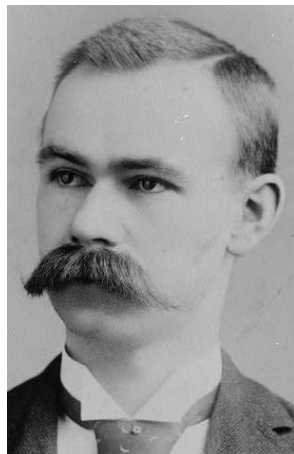
Herman Hollerith
Born: Feb. 29, 1860;

Buffalo, New York
Died: Nov. 17, 1929

Hollerith's invention of the punched card tabulating machine marked the dawn of data processing systems, and the company he founded, Tabulating Machine Company, became IBM [Feb 14], the data processing behemoth of the 20th century.

In the mid-1880's, with encouragement from John Shaw Billings (head of the vital statistics division of the Census Office), Hollerith began experimenting with methods to speed up tabulation using electro-mechanical devices.

In 1887 he built a machine to tabulate death records, which was put to the test in Baltimore. His machine completed the task in several days, a job which normally took humans three weeks to accomplish.

Herman Hollerith (1888). Photo by Charles Milton Bell.

On [Jan 8] 1889, he was granted patents for his devices, and in June entered a competition to win a contract with the Census Office to tally the forthcoming 1890 census [April 17]. Hollerith's punch card machines won easily.

The count of the 1890 census (the 11th) was a resounding success [Aug 16], saving the government an estimated five years in labor (down from 8 years to 3). Some 62 million cards were processed by 43 Hollerith machines.

The following 1900 census was tabulated in only six weeks, despite a 50% increase in the population over 1880.

In 1896 Hollerith founded the Tabulating Machine Company (TMC). TMC changed names a few times but became the Computing, Tabulating, and Recording company (C-T-R) on [June 16] 1911, with Hollerith its chief consulting engineer and a major stockholder.

On [Feb 14] 1924, after various other mergers and acquisitions, International Business Machines (IBM) was born. Hollerith had departed the company a few years previously, leaving its running to Thomas J. Watson [Feb 17], who had joined C-T-R as General Manager on May 1, 1914.

Seymour Papert
Born: Feb. 29, 1928;

Pretoria, South Africa
Died: July 31, 2016

Papert led the constructionist movement in education, building upon the work of Jean Piaget who Papert worked with in the early 1960's. Papert applied Piaget's ideas to the development of his LOGO language, co-invented with Wally Feurzeig and Cynthia Solomon.

The name was derived from the Greek word logos, meaning "thought". Feurzeig came up with it to distinguish the language from others that were primarily number-based.

LOGO controlled the movements of a mechanical "turtle," which traced its path by dragging a pen over paper. The first working turtle was finished in 1969.

At MIT from 1963, Papert was the co-director of the AI Lab with Marvin Minsky [Aug 9], and the pair co-authored the controversial [Jan 00] 1969 book "Perceptrons".

In 1985, Papert became a founding member of the MIT Media Lab [Dec 1], where he led research groups on epistemology and the future of learning.

In 1980, Papert wrote "Mindstorms: Children, Computers, and Powerful Ideas", in which he argued for the teaching of computer literacy in primary and secondary schools. The Lego Mindstorms programmable construction set ([Jan 26] 1998) is named after the book, and uses hardware derived from the "programmable brick" concept developed in the Media Lab.

Two quotes: "A programming language is like a natural, human language in that it favors certain metaphors, images, and ways of thinking." (from "Mindstorms")

"People give lip service to learning to learn, but if you look at curriculum in schools, most of it is about dates, fractions, and science facts; very little of it is about learning. I like to think of learning as an expertise that every one of us can acquire."

Minskytron Published
Feb. 29. 1972

The Minskytron draw pretty colored points and arcs on the PDP-1's [Nov 00] most famous output device, the Type 30 Precision CRT display. Its beautiful visuals were a major inspiration for Spacewar! [May 17].

The Type 30 was originally developed for use in radar, which probably explains its 19-

inch (or perhaps 16-inch) diameter circular screen in a distinctive hexagonal case. It was capable of displaying 1024x1024 points (pixels) within a 9.5 inch square, at a refresh rate of 20,000 points per second. It came with an optional light pen.

The Minskytron's drawing code depended on the calculation of three dynamically changing and interconnected elliptical functions. Despite exhibiting very pleasing, complex patterns, it was based on Marvin Minsky's [Aug 9] circle-drawing algorithm which using nothing more than additions, subtractions, and bitwise right-shifts. Minsky invented the algorithm by accident while trying to speed up a Type 30 display hack coded by Ben Gurley [Dec 12]. The Minsky algorithm was eventually published as Item 149 in the famous article, "HAKMEM, Programming Hacks", co-edited by Bill Gosper [April 26].

A PDP-1 Type 30 Display running the Minskytron. Photo by Joi Ito. CC BY 2.0.

During the 1960's the MinskyTron was joined by two other graphics demos: "Munching Squares" by Jackson Wright, and Snowflake by David Mapes. Short films of these programs were made, and widely shown, including at a meeting of the Motion Picture Academy of Arts and Sciences in 1968. However, due to a difference in the refresh rate of the Type 30 and the camera's frame rate, the movies included color rippling and fading which weren't part of the original code.

An emulation of the Type 30 running several variations of these programs is online at https://www.masswerk.at/minskytron/. There's also a splendid book full of MinskyTron output: " Minskys & Trinskys: Exploring An Early Computer Algorithm" by Julian and Corey Ziegler Hunts, Bill Gosper, and Jack Holloway (2011).

Atari's Vault
Feb. 29 ??, 1996

The failure of the Lynx [Sept 1] and Jaguar [Nov 23] left Atari [July 1] without a successful product, and Jack Tramiel [Dec 13] began looking to sell the company.

During this time, Atari moved part of its headquarters from 1196 Borregas Ave. (their home since 1984) to 455 South Mathilda in Sunnyvale, only five minutes away. The new address was once a Bank of America building, and the bank vault was still there.

In July, Atari merged with JTS Inc., a maker of hard disk drives, and although management maintained that it would continue to market game consoles and software, Atari's staff was quickly gutted by 80% and its assets liquidated.

The physical Atari bank vault should not be confused with "The Atari Vault", a collection of a hundred Atari games from the 1970's, 1980's, and 1990's, including Asteroids [Nov 13], Centipede, and "Missile Command". It was released by Code Mystics in March 2016.

First R
Feb. 29, 2000

The R language supports a wide variety of statistical techniques, including linear and nonlinear modeling, time-series analysis, classification, and clustering. Another of its strengths is the production of publication-quality graphs.

The R project was conceived in 1992 by Ross Ihaka and Robert Gentleman at the University of Auckland, after a chance encounter in a corridor.

R is named after the two developers, and partly as a play on the name of an earlier statistics language called S. S was created by John Chambers, Rick Becker, and Allan Wilks at Bell Labs.

Raspberry Pi
Feb. 29, 2012

The first generation of the Raspberry Pi (RPi) single-board computer, the Model B, was released on this day, followed by the even simpler and less expensive Model A.

The credit-card sized device weighed only 45 grams and sold for around $30. Later versions became faster and sometimes even cheaper, with the RPi Zero costing around $5. In Nov. 2020, total sales reached 36 million.

All the models utilize a Broadcom system on a chip with an integrated ARM-compatible CPU [April 26] and GPU. Incredibly, the RPi Zero offers performance similar to the Intel Pentium III [Feb 26].

The Raspberry Pi Zero. Photo by Evan-Amos.

The device primarily runs Raspbian, a Debian-based Linux [Sept 15], but others OSes can be installed. For more Linux distributions, see [May 00], [July 17], [Aug 11], [Dec 22], [Oct 20], and [April 15].

Eben Upton started the RPi project in 2006, with the aim of creating a computer that would inspire children, students, and hobbyists, hopefully following in the footsteps of the BBC Micro [Dec 1]. Indeed, the Model A, Model B, and Model B+ names are all intentional references back to BBC Micro models.

Upton was teaching computer science at the University of Cambridge at the time, and had noticed a decline in the overall skills of the students, a concern shared by other members of the Computer Lab. The anxious academics, in collaboration with Pete Lomas and David Braben [Sept 20], formed the Raspberry Pi Foundation in May 2009.

Upton has also found time to publish several books, including the "Oxford Rhyming Dictionary," co-authored with his father Clive.

The Raspberry Pi is sometimes confused with the Arduino [April 27], but the Pi is a general-purpose computer while the Arduino is a microcontroller.

The Leap Year Problem
Feb. 29, every year

The leap year problem results from errors in the determination of leap years, and often manifests itself on this day, at least in the Gregorian calendar.

Today's date occurs in every year that's an integer multiple of 400 or a multiple of 4 and not a multiple of 100. Sample code for checking this is:

```
boolean isLeapYear =
   (year % 400 == 0) ||
   ((year % 4 == 0) &&
    (year % 100 != 0));
```

Sadly many libraries implement something like:

```
boolean isLeapYear =
   (year % 4 == 0);
```

One famous example is in Microsoft Excel [May 2], which since its earliest versions has incorrectly considered 1900 to be a leap year. Microsoft has explained this 'feature' as purposely included for backward compatibility with Lotus 1-2-3 [Jan 26].

The year following a leap year will start later by two days, which is another situation where errors may arise. For example, at midnight on [Dec 31], 2008, many first generation Zune 30 models froze. The problem automatically fixed itself 24 hours later, but an intermediate remedy for people who didn't want to wait was to drain their device's battery and recharge it after noon on Jan 1.