Sept. 9th

Phone Math

Sept. 9, 1940

George R. Stibitz [April 30] gave the first demonstration of "remote computing" using his Complex Number Calculator (CNC) [Jan 8]. The machine had been designed so its calculating unit was separate from its teletypes, which were normally located in a different room at Bell Labs [Jan 1]. For this demo, Stibitz extended the distance somewhat, relocating one of the terminals to an American Mathematical Society meeting at Dartmouth College in New Hampshire. Phone engineers had set up a direct link between the college and the CNC in NYC the day before.

The meeting's attendees were asked to suggest math problems that were typed into the teletype. Correct answers were returned approximately a minute later to the astonishment of the gethered crowd. It would be another ten years before remote access of this type was tried again.

A bronze plaque commemorating the event is located in the entry way of McNutt Hall at Dartmouth.

Dennis MacAlistair Ritchie

Born: Sept. 9, 1941;

Bronxville, New York
Died: October 12, 2011

Ritchie was the co-inventor of UNIX and C, or as Brian Kernighan [Jan 1] said: "UNIX [Oct 15] is Ken Thompson [Feb 4] with an assist from Dennis Ritchie. And C is Dennis with an assist from Ken."

Ritchie and Thompson had worked on Multics [Nov 30] at Bell Labs during the 1960s. After Bell dropped out of the project in 1969, they started working on a small-sized successor to Multics that could run on an old PDP-7 [Dec 00]. (It had to be small since the machine only had 4K of memory.)

In 1970, Kernighan suggested the system be called "UNIX", a pun on "Multics". Ritchie and Thompson wrote the first UNIX Programmer's Manual in 1971.

Ritchie designed C because the first UNIX kernel was written in assembly language, and he and Thompson decided they needed a higher-level systems language.

C's "grandfather" was BCPL, designed by Martin Richards [July 21] (and itself based on CPL). First, Thompson created B by simplifying BCPL, and B was replaced by Ritchie's C. According to some legends, B was named after Thompson's wife Bonnie. C adding data types and some new syntax. More importantly, it was compiled into machine code while B was an interpreted language. The new language was initially called "NB," for "New B," and later renamed C.

Meanwhile, Ritchie, Thompson, and others had asked Bell Labs to buy a PDP-11/20 [Jan 5] as hardware for a text preparation project. Although the $100,000 machine was occasionally used for that purpose, most effort went into porting UNIX across to it.

C's development started in earnest in 1972 on the new PDP-11, and a large part of UNIX was subsequently rewritten in it.

In 1978, Kernighan and Ritchie published the first edition of "The C Programming Language" , often called "K&R" by the Cognoscenti, or sometimes the "White book", due to its color. There were still a few oddities in the language in its pre-ANSI C days. For example, 8 and 9 were treated as valid octal digits, with the values 10 and 11.

Ritchie first became interested in computing while at Harvard, after attending a lecture by Jean Sammet [March 23] who described programming on the UNIVAC.

Surprisingly, Ritchie never officially completed his doctorate although his 1968 dissertation was approved by his thesis committee. He never got round to the boring administrative task of submitting it to library. His attitude was, 'If the Harvard library wants a bound copy for them to keep, they should pay for the book, because I'm not going to!'

Some Ritchie quotes: "UNIX is simple. It just takes a genius to understand its simplicity."

"C is quirky, flawed, and an enormous success."

Another opinion on C, by Waldi Ravens: "A C program is like a fast dance on a newly waxed dance floor by people carrying razors."

First Bug

Sept. 9, 1947

At 3:45 pm, at the Naval Weapons Center in Virginia, Grace Hopper [Dec 9] described the first computer bug in the Harvard Mark II [Aug 7] log book. It had been caused by a real-life moth becoming stuck in relay #70 on panel "F" of the machine. Hopper taped the moth into the book with the explanation: "First actual case of bug being found."

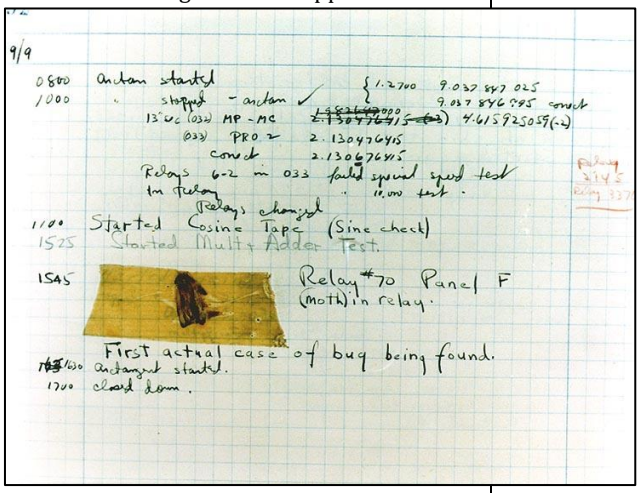
Hopper also recorded the story in her own log book: "It was over in another building, and the windows had no screens on them and we were working on it at night, of course, and all the bugs in the world came in. And one night she (Mark II) conked out and we went to look for the bug and found an actual large moth, about four inches in wing span, in one of the relays beaten to death, and we took it out and put it in the log book and pasted Scotch tape over it."

This was not the first use of the word "bug" to denote a failure. Harvard personnel had been using the word to describe problems with their machines for several years by then. For example, Robert Campbell's log

book entry for April 17, 1944, kept while working on the Harvard Mark I [Aug 7] noted, "Ran test program. Mr. Durfee from IBM was here to help us find the 'bugs'."

Way back in the 1870s, Thomas Edison [Feb 11] frequently used the word. It first appeared in his notebooks in July 1876, in connection with experiments on multiplexing signals over a wire.

Thomas Sloane later popularized the term in his 1892 Standard Electrical Dictionary. He defined a bug as "[a]ny fault or trouble in the connections or working of electric apparatus."



The "first computer bug" (a moth). Photograph NH 96566-KN, Naval Surface Warfare Center, Dahlgren, VA.

As you might expect, the related word "debug" also predates this day. The Oxford English Dictionary entry for "debug" cites the term "debugging" in a 1945 article in the *Journal of the Royal Aeronautical Society* about airplane engine testing. An article in *Airforce* (June 1945 p. 50) also refers to debugging, of aircraft cameras.

However, "bug" terminology wasn't widely adopted by programmers until the early 1950s. In the ACM's digital library [Sept 15], the term "debugging" first crops up in three papers in 1952. The phrase "computer bug" began to appear in the popular press at around the same time. For example, in a "Grin and Bear It" cartoon from Sunday, March 23, 1952 by the cartoonist George Lichty. For more computing cartoons, see [March 12], [April 16], [July 5], [Aug 23], [Sept 24], [Oct 17].

Speedcoding
Sept. 9-11, 1953

John Backus [Dec 3] presented his Speedcoding language at a General Meeting of the ACM [Sept 15] at MIT.

Aside from abstracting away from the IBM 701's [April 7] low-level machine code, Speedcoding also made its hardware look like it had floating-point, free-address memory with index registers, whereas it was in fact a fixed-point, single-address computer without index registers.

For these reasons, most 701 programmers adopted Speedcoding, although it exacted a price. The system ran 10-20 times slower than raw machine code because it had to do all the extra work of simulating floating-point and index registers. Also, it occupied a whopping 310 words of memory, about 30% of the 701's available storage.

Backus had started developing the language in January after struggling with low level programming on the IBM SSEC [Jan 27].

Many historians argue that Speedcoding was the first high-level programming language with a compiler. Other possibilities for first compiler are the Laning and Zierler system [Jan 00] and Hopper's A-0 [May 2]

Mobot Mark I
Sept. 9, 1959

Robert W. Henderson of Sandia Corp., and Allen E. Puckett of Hughes Aircraft, unveiled the Mobot Mark I (aka Mobot the Magnificent Monster).

The machine carried out work in "hot" areas of the Atomic Energy Commission's Sandia labs in Albuquerque, controlled via a 150-meter cable back to a console

The Mobot had two six-foot long arms with two cameras and microphones. Its arms could move 180 degrees in any direction at each of its three joints, and could lift 35 lbs. The robot hands were equipped with soft inflated pads to allow it to grasp delicate objects with variable pressure.

A 1964 *Life* magazine article on a later version of the Mobot proposed that it might be used to help women put on makeup and get dressed.

For more industrial robots, see [Dec 10; March 13].

Who Wrote the Fedralist Papers?
Sept. 9, 1962

Historians had puzzled over the authorship of 12 of the 85 Federalist Papers almost since they were written in 1788. Scholars had determined that Alexander Hamilton wrote forty-three of them, James Madison fourteen, and John Jay five. Madison and Hamilton also wrote three of the articles jointly. But the essays numbered 49 through 58 and 62 and 63 were a bit of a mystery.

Two mathematicians, Harvard's Frederick Mosteller and the University of Chicago's David L. Wallace applied statistical analysis and computational power to the problem, announcing their results during a special session of the American Statistical Association held on this day.

Their findings – that James Madison authored all 12 – created a national stir, both for the answer and for how they put a computer, an IBM 7090 [Nov 30], to work to arrive at it.

The key to solving the mystery was the use of filler words – also, of, by, on, this – along with "markers." Hamilton favored the word "upon," using it three times in every thousand words, while Madison used it only once every six thousand words.

For more literary shenanigans with computers, see [Feb 1; Aug 1; Aug 22; Sept 11; Oct 26; Dec 25].

TCP on a Napkin

Sept. 9-15, 1973

Next: [May 5]

In the spring of 1973, Vint Cerf [June 23] and Robert Kahn [Dec 23] began working on a new networking protocol for the ARPANET, which became TCP.

The first version of their work became the paper, "A Protocol for Packet Network Interconnection", which they distributed on this day at a networking conference at the University of Sussex in the UK [see next entry]. The paper was eventually published in the *IEEE Transactions of Communications Technology* on [May 5], 1974.

Unlike TCP, ARPANET's existing Network Control Program (NCP) didn't have the ability to address arbitrary networks. Also, NCP relied on the ARPANET to provide error recovery and end-to-end reliability, whereas it was baked into TCP.

Most of the TCP design work was carried out during sessions at Rickey's Hyatt House in Palo Alto or at a Marriott hotel next to Dulles Airport. Kahn recalled, "Vint liked to get up and draw these spider drawings. Often times we would have a conversation back and forth and he would say, 'Let me draw a picture of that.'"

An abiding legend of the period is of Cerf sketching the architecture on the back of a napkin or envelope in a San Francisco hotel lobby. The hotel is never named, and the sketch may have produced in March or October 1973. Bearing in mind the timing of the Sussex meeting, I vote for March, and the hotel as Rickey's Hyatt House. For over six decades, Rickey's [June 5] was located at 4219 El Camino Real in Palo Alto, but was demolished in 2006.

CYCLADES Reported

Sept. 9-15, 1973

CYCLADES was a French research network created to experiment with packet switching. It was the first to make the individual computer hosts responsible for the delivery of data, rather than use a centralized service. Also, messages were exchanged without any guarantee of delivery, which simplified the design, reduced network latency, and lessened the opportunities for failures. These concepts were later adopted by the Internet protocols which replaced the ARPANET [Jan 1].

The CYCLADES project was directed by Louis Pouzin, and based at the Institut de Recherche en lnformatique et en Automatique (IRIA [?? 1914]), now known as INRIA. Work began in 1972, and the network was first demoed in Nov. 1973 running across three hosts. The research was reported on this day by Pouzin at a networking conference at the University of Sussex in the UK [see previous entry].

IBM 5100 Released

Sept. 9, 1975

The IBM 5100 was perhaps the world's first "portable" computer, and was released nearly six years before the IBM PC (5150) [Feb 16]. Portable is in quotes since the device weighed a hefty 55 lbs., although it was briefcase-sized and came with a carrying case.

The IBM 5100. Photo by Sandstein. CC BY-SA 3.0.

It could use up to 64K of RAM, included a 16-line by 64-character 5-inch display, and magnetic tape storage.

Other computers of approximately the same size, such as the HP 9830 [Dec 00], didn't include a display or nearly as much memory. (There's also some argument over whether the HP-9830 was a calculator or computer.)

Little or no software was available upon the machine's release, and no third-party support community grew up around it unlike for the Altair [Dec 19]. However, IBM did sell three magnetic tape libraries, containing more than 100 routines for maths, statistics, and financial analyses.

The 5100 was based on a prototype called the SCAMP (Special Computer APL Machine Portable) developed at the IBM Los Gatos Scientific Center in 1973 by a team led by Paul Friedl and Bill Lowe [Jan 15].

Obtaining an IBM 5100 was supposedly the reason for time-traveller John Titor's visit in [Nov 2] 2000.

Compaq Deskpro 386

Sept. 9, 1986

Compaq [Feb 14] introduced the Deskpro 386, the first PC by a

major manufacturer to utilize an Intel 80386 [Oct 17]. The 386's 32-bit architecture was a significant improvement over previous microprocessors, and made the Deskpro the fastest PC in the world at the time. In one test, it ran IBM software two or three times faster than IBM's top-of-the-line 6 MHz 286-based PC/AT [Aug 14].

The success of the Deskpro gave rise to a whole army of similar clones that chipped away at IBM's early dominance of the PC market.

The 386 chip also finally made GUIs practical for IBM PCs and PC-compatibles. If you wanted to run MS Windows [Dec 9], it was a good idea to buy a Compaq.

Sneakers Released

Sept. 9, 1992

The movie "Sneakers" was directed by Phil Alden Robinson, and starred Robert Redford. A group of wily hackers must pit themselves against shadowy governmental forces looking for a black box that can crack any encryption.

Len Adleman [Dec 31] (co-inventor of RSA) served as a consultant on the film, and spent several days constructing the slides one character displays at the college symposium on "unbreakable codes".

One of the hackers, Whistler, is patterned after Joe Engressia [May 25], a blind telephone expert born with perfect pitch.

The film's press kit was accompanied by a floppy disk containing a program explaining the movie. Parts of it were quasi-encrypted, requiring the user to enter an easily guessable password to proceed. It can be found online at `https://archive.org/details/Sneakers_Film_Promotional_Floppy`

The script was co-written by Walter Parkes and Lawrence Lasker, who first thought of the movie while doing research for "WarGames" [June 3].

Fear the 9/9/99

Sept. 9, 1999

As 1999 entered its final months, most anxiety focused on what might happen at midnight of [Dec 31], but there were also concerns about today's date (9/9/99, or 9999) . Some doomsayers thought it might trigger a round of massive computer failures as older software confused "9999" with the old style End Of File (EOF) marker.

For example, the Maritime and Coastguard Agency in the UK were put on standby for accidents in British waters caused by the failure of computer-based navigational equipment.

Daft Punk (2010). Photo by James Whatley. CC BY 2.0.

The day came and went with no major incidents, although "Daft Punk", a French electronic music duo, announced: "We were working on our sampler, and at exactly 9:09 am on September 9, 1999, it exploded. When we regained consciousness, we discovered that we had become robots."

For links to numerous other date/time related problems, see [Jan 1].

Unix Time Billennium

Sept. 9, 2001

At 01:46:40 UTC (or GMT), UNIX time [Jan 1] required 10 decimal digits for the first time as it reached 1,000,000,000 seconds, and hence the "Billennium" name, a portmanteau word based on "billion" and "millennium".

There were a few reports of problems, mainly in programs that stored time as text. In particular, a sort would place a string starting with a "1" before strings starting with a "9".

UNIX time had hit 9 decimal digits on March 3, 1973, and will reach 2 billion seconds at 23:33:20 UTC on May 17, 2033.

For links to numerous other date/time related problems, see [Jan 1].