Feb. 10th

Edith Clarke

Born: Feb. 10, 1883;

Howard County, Maryland
Died: Oct. 29, 1959

Clarke was the the first woman to earn an electrical engineering Masters degree from MIT (in 1919), the first woman employed as an electrical engineer in the US (1922), the country's first female professor of electrical engineering (1947), the first woman to deliver a paper at the American Institute of Electrical Engineers' (AIEE [May 13]) annual meeting (1926), and the first female Fellow of that institution (1948). The AIEE became the Institute of Electrical and Electronic Engineers (IEEE [Jan 1]) in 1963.

Edith Clarke. (c) IEEE.

She was the eponymous inventor of the Clarke calculator (1921) for solving equations involving power transmission lines, which was around ten times faster than previous approaches.

In an interview with the *Daily Texan* in 1948, Clarke observed: "There is no demand for women engineers, as such, as there are for women doctors; but there's always a demand for anyone who can do a good piece of work."

Walter Houser Brattain

Born: Feb. 10, 1902;

Xiamen, Fujian, China
Died: Oct. 13, 1987

Brattain, along with John Bardeen [May 23] and William Shockley [Feb 13], invented the point-contact transistor at Bell Labs on [Dec 16], 1947, and shared the 1956 Nobel Prize in Physics [Dec 10]. Brattain is usually considered the experimentalist who built devices, Bardeen the theoretician, and Shockley the manager.

Brattain said, when told of the award, "It is a great satisfaction to have done something in life and to have been recognized for it in this way. However, much of my good fortune comes from being in the right place, at the right time, and having the right sort of people to work with."

Unlike Bardeen (who moved to the University of Illinois in 1951) and Shockley (who left Bell Labs in 1955 to found his own company), Brattain continued working at Bell until his retirement in 1967.

Brattain, Walker Bleakney, Vladimir Rojansky, and E. John Workman had been physics undergraduate classmates at Whitman College in Washington state. Their distinguished careers led later Whitman students to call them "the four horsemen of physics".

Robert William Taylor

Born: Feb. 10, 1932;

Dallas, Texas
Died: April 13, 2017

While Taylor was a project manager at NASA, he helped fund Douglas Engelbart's [Jan 30] work at SRI. In 1965 he moved to ARPA [Feb 7] as a deputy to Ivan Sutherland [May 16], director of the Information Processing Techniques Office (IPTO [Oct 1]). During this time, Sutherland and Taylor lobbied ARPA to support the creation of a wide area computer network. This was perhaps inspired by Taylor's office setup, which housed three terminals – one connected to MIT, one linked to the Berkeley Timesharing System [Nov 30], and one tied to System Development Corp. [Oct 00] in Santa Monica. Each system supported active user communities who could only talk to each other with some difficulty.

In June 1966, Taylor became IPTO director, and soon after persuaded Charles Herzfeld, then head of ARPA, to divert funds from ballistic missiles programmes to the ARPANET [July 29]. "Great idea," said Herzfeld. "Get it going. You've got $1million more in your budget right now. Go." The meeting had taken 20 minutes.

Taylor also convinced Larry Roberts [Dec 21] to join ARPA to coordinate the ARPANET's construction.

"The Computer as a Communication Device," published in 1968 by J. C. R. Licklider [March 11] (the first IPTO director) and Taylor, laid out their vision for the future of the Internet. Taylor once remarked, "My bias was always to build decentralization into the net. That way it would be hard for one group to gain control. I didn't trust large central organizations."

In 1970, Taylor founded and became the first manager of Xerox PARC's [July 1] Computer Science lab. Donald Knuth [Jan 10] once called it "the greatest by far team of computer scientists ever assembled in one organization."

Abraham Lempel

Born: Feb. 10, 1936;

Lwów, Poland (now Lviv, Ukraine)
Died: Feb. 4, 2023

Lempel and Jacob Ziv [Nov 27], developed the Lempel-Ziv (LZ) family of lossless data

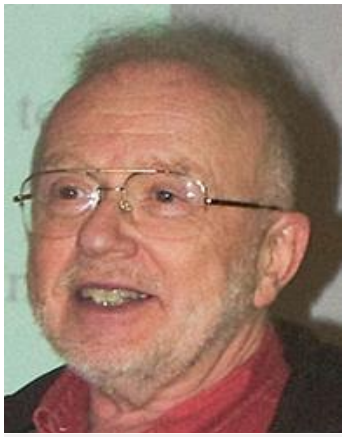
compression algorithms – LZ77 in 1977 and the improved LZ78 in 1978. Broadly speaking, Ziv formulated the concepts while Lempel developed the algorithms. Their work became the basis for many other compression methods, including Lempel-Ziv-Welch (LZW [June 20]), and DEFLATE used in PNG [Oct 1] and ZIP.

David Lorge Parnas

Born: Feb. 10, 1941;

Plattsburgh, New York

Parnas is a Canadian software engineering pioneer who developed the concept of information hiding in 1971, one of the most important elements of OOP. However, Parnas later remarked, "unfortunately, most of the O-O code that I have seen hides nothing. The programs look like COBOL programs with a new syntax."



David Parnas (2002). Photo by Hubert Baumeister. CC BY-SA 3.0.

Parnas was also an eager proponent of the professionalization of "software engineering", a term that he characterized as "an unconsummated marriage".

Some quotes: "Artificial intelligence has the same relation to intelligence as artificial flowers have to flowers. From a distance they may appear much alike, but when closely examined they are quite different."

"As a rule, software systems do not work well until they have been used, and have failed repeatedly, in real applications."

SIMULA 67 Frozen

Feb. 10, 1968

SIMULA 67 (aka Simula) is considered the first object oriented language. It introduced the ideas of objects, classes, inheritance and subclasses, virtual procedures, co-routines (processes), discrete event simulation, and garbage collection. The language was developed over many years by Kristen Nygaard [Aug 27] and Ole-John Dahl [Oct 12] at the Norwegian Computing Center (NCC) in Oslo.

Simula was officially unveiled by Dahl and Nygaard at the IFIP Conference on Simulation Languages in Lysebu near Oslo in May 1967, and formally frozen on this day at the first meeting of the Simula Standards Group (SSG). (This seems appropriate for Oslo where the temperature can easily drop below 0 C.)

SIMULA 67 was preceded by SIMULA 1 which was first presented at the 1962 IFIP World Congress in Munich. At that time it was considered an extension of ALGOL 60 [Jan 11], which simplified the creation of discrete event simulations, and borrowed some of its simulation ideas from SIMSCRIPT [July 17].

The big change from SIMULA 1 to 67 was the introduction of the superclass, and the clever idea that a "process" could be implemented using inheritance so that different classes could use and modify process behavior through subclassing. Dahl and Nygaard later said they had been heavily influenced by Tony Hoare's [Jan 11] record class construct in this regard.

One reason Simula didn't spread more widely was that the NCC viewed its software as a product that should pay for itself. For example, Donald Knuth [Jan 10] was interested in experimenting with Simula at Stanford in 1973, but Stanford refused to pay the costly license.

Macintosh Signing Party

Feb. 10, 1982

Since the Macintosh [Jan 24] team considered themselves artists, it was only appropriate that they sign their work. Steve Jobs [Feb 24] came up with the idea of having each team member's signature stamped on the inside of every Mac's case. At today's signing party, Jerry Mannock, the manager of the industrial design team, spread out a large piece of drafting paper on the table to collect those signatures.

The "John Hancock"s of a few major contributors were added later: Steve Wozniak [Aug 11], Jef Raskin [March 9] and Bud Tribble [Aug 3], plus those of a some others who joined the team later. Wozniak was on leave after his plane accident [Feb 7]. Raskin had been the original Mac team leader, but had been pushed out by Jobs in the summer of 1981.

Probably the Mac SE/30 (1989) was the last one to include the signatures since the Mac Classic (the next model; 1992) featured a newly designed case.

The Mac wasn't the only signed Apple computer: there were about 50,000 Apple IIGS's released as "Woz Special Editions" in 1986 that had Wozniak's autograph ("Woz") engraved on the front right corner of the case.

Fame: Blood, Sweat and Circuits

Feb. 10, 1983

Today saw the airing of the "Blood, Sweat and Circuits" episode (Season 2.17) of the TV show Fame, about the lives and loves of the talented (yet oft tormented) staff and students of

New York's High School of the Performing Arts.

Bruno (an introverted musical genius) is delighted to accept a challenge from a skeptical Miss Sherwood to create "art" on a computer. But then he makes the heart-breaking discovery – the school has only acquired a PC so they can sack kindly, but elderly, Mrs. Berg.

The technical gear is shown off in a scene where a dancer performs while a video camera recording his movements. Bruno presses some keys, and the image turns into a series of abstract patterns on the screen.

The computer was real – a Chroma-Chron (1979), one of the first digital video synthesizers, designed by Ed Tannenbaum. It was intended for use in night clubs and during live performances.

The video was passed through a 256x244x4 frame buffer in real-time to create an animation and graphics. Programming was done in Forth [Nov 13] and assembler.

The hardware was based on technology Tannenbaum had developed in 1981 for an interactive exhibit called "Recollections" while Artist in Residence at the Exploratorium in San Francisco.

Therac-25 Recalled

Feb. 10, 1987

The Therac-25 radiation therapy machine contained at least four software bugs that meant it dosed six (or more) people with massive amounts of radiation, resulting in serious injury and fatalities. On this day, the FDA pronounced the machine defective under US law, and recalled it.

The Therac-25 supported two types of therapy: a low-powered direct electron beam mode and a megavolt X-ray mode, which required patient shielding. The trouble was that the software had been repurposed from the previous model of the device, and hadn't been adequately tested. The same variable was used for analyzing input values and for tracking the mode, and quickly entering data could result in leaving the mode incorrectly set.

Even worse, there was a second bug which could cause the mode's power level to be assigned its largest possible value. A one-byte wide flag was used as a boolean to decide whether to check the beam's positioning. Unfortunately, the software incremented the flag's value, which meant that after 256 steps, it would overflow back to zero. If that zero lined up with a certain operator action, the beam would fire at full strength.

A standard one-time therapeutic dose of radiation is around 200 rads;1000 rads is a lethal dose; but the Therac was pumping out 20,000 rads. At least two patients screamed in pain and tried to run from the room during their treatment with the device. All of the victims suffered radiation poisoning, with at least two dying as a result.

Earlier Therac models had protective circuits and other measures to ensure safe operation, but they'd been removed from the Therac-25.

For more radiation problems, see [May 26]. For other numerical errors, see [Feb 25], [June 4], [Aug 1], [Sept 23], [Oct 24].

The Internet Phone

Feb. 10, 1995

VocalTec released the first commercial Voice over IP-based PC software, the "Internet Phone", but forward-thinking *Wired* magazine [Jan 2] dubbed it the "iPhone".

It provided two-way, real-time voice chat via the Internet, but the PC required a 486 processor, 8 MB of RAM, and a 16-bit sound card, which was a pretty high-end specification for its day.

The software was developed by Alon Cohen and Lior Haramaty, the two co-founders of VocalTec, and included novel features for dealing with slow connections and packet loss. This made it quite popular almost a decade before Skype [Aug 29] released its first client application.

For other iPhones, see [Jan 6] and [Nov 26].

Kasparov Beats Deep Blue (Part 1)

Feb. 10, 1996

IBM's "Deep Blue" [Dec 5] chess-playing computer played its first game against Garry Kasparov, the reigning world champion, and beat him. This was the first time a machine had won a game against a player of such a high rank.

Garry Kasparov (2007). Photo by Owen Williams. CC BY-SA 3.0.

However, Kasparov won three and drew two of the following five games, winning the overall match 4–2 (wins count as 1 point, draws count as 0.5). The match concluded on Feb. 17, 1996.

This wasn't the end of the matter though. IBM heavily upgraded "Deep Blue", nicknamed "Deeper Blue", and it was rematched against Kasparov in 1997 [May 11].

At the time Bill Gates [Oct 28] pointed out: "Computers are getting faster and programmers are doing a better job. It is just a

matter of time before a computer becomes chess champion. But so what? … A computer doesn't think when it plays tic-tac-toe, and it doesn't think when it plays chess"

For more gaming defeats of humans by computers, see [Jan 11], [April 29], [Oct 5].

XML 1.0 Recommended

Feb. 10, 1998

Extensible Markup Language (XML) is a set of rules for encoding documents in a hierarchical format that's both human- and machine-readable. It was initially intended to be a streamlined and simplified version of SGML [May 00]. Unfortunately, XML and its many extensions have regularly been criticized for verbosity and complexity.

The XML working group consisted of eleven members, supported by a 150-member interest group. James Clark [March 23] served as technical lead, and contribute the "XML" name.

The major design decisions were reached between Aug. and Nov. 1996, with further design work in 1997. In all that time, the group never met face-to-face; the design was hammered out using a combination of email and weekly teleconferences.

XML, perhaps unfairly, is closely associated with the "Billion Laughs" denial of service (DoS) attack [March 18; Aug 11; Aug 17; Sept 6; Dec 21], which was initially aimed at XML parsers.

A typical attack consists of defining ten entities, each consisting of ten of the previous entity. When parsed, the document will expand to one billion copies of the first entity. In the most frequently cited example, that is the string "lol" [June 14], hence the name "billion laughs".

While the original form of the attack was directed at XML, the attack is possible in any file format that can contain references.

"The essence of XML is this: the problem it solves is not hard, and it does not solve the problem well." – Phil Wadler [April 8]