Jan. 18th

Transatlantic Message

Jan. 18 (or 19), 1903

The first public two-way transatlantic wireless message (written in Morse code [Oct 19]) was sent between President Teddy Roosevelt in the US and King Edward VII in England (with the help of willing telegraph operators).

The message was passed between three transmission stations in Poldhu, England, Glace Bay, Canada, and South Wellfleet, Massachusetts. The stations were powered by generators noisy enough to be heard four miles away.

The value of this technology was made clear on Jan. 23, 1909, when the ocean liner Republic collided with another ship and began to sink. The station in Wellfleet received the ship's distress signal, alerted other vessels in the area, and almost all the passengers were rescued.

Marconi had sent the first transatlantic message west from Poldhu to Newfoundland on [Dec 12] 1901.

Christopher J. Date

Born: Jan. 18, 1941;

Watford, UK

Date's work on relational database theory includes his involvement in the design of the IBM products SQL/DS (1981) and DB2 (1983). He's also the author of the standard textbook on databases, "An Introduction to Database Systems".

Despite his early promotion of SQL [May 1], Date is now an outspoken critic, arguing that SQL doesn't correctly implement the relational model, and any inadequacies in relational DB management systems are due to their implementation, not the underlying theory.

In another book, "The Third Manifesto", co-written with Hugh Darwen, they describe an alternative to SQL, called D, which combines the relational model and type theory, including support for inheritance.

Date entered the computer business in 1962 as a programmer at Leo Computers in London when they were developing the Leo III [Sept 5]. He chose computing because it was "the only job that seemed to be available to mathematicians at the time that didn't sound totally boring."

Colossus Mark 1

Jan. 18, 1944

The Mark 1 was designed by Tommy Flowers [Dec 22] at the Post Office Research Station in Dollis Hill, London, with help from mathematicians Max Newman [Feb 7] and Bill Tutte. While Alan Turing [June 23] is sometimes credited with the Mark I's development, he actually had no direct involvement.

The Mark 1 is regarded as the world's first all-electronic calculating device. However, it wasn't a general-purpose computer since it was intended only for cryptanalytic tasks.

Equipped with 1,600 vacuum tubes, it was capable of reading input from paper tape, and applying functions to the data at a rate of around 5,000 characters per second. Its tubes could switch in around a millionth of a second, rather than the thousandths of a second offered by mechanical relays.

The machine was constructed over ten months in 1943, and shipped to Bletchley Park [Aug 15] on this day. It was re-assembled by Harry Fensom and Don Horwood, and first put to work on Feb. 5. It was only at this point that it was christened the Colossus, by its WRNS (wren) operators, due to its size.

One common misconception is that the Colossus was used to crack Enigma ciphers [Feb 23]. In fact, Turing's earlier electromechanical Bombe [March 18] worked on Enigma, and the Colossus was designed to break the more complex Lorenz ciphers. It replaced the slow and unreliable Heath Robinson [June 1] for that task, and reduced the time to crack messages from weeks to hours.

A total of ten Colossi were delivered during 1944, and the improved Colossus Mark 2 started working on [June 1] 1944. All of these developments were kept secret until Frederick Winterbotham published "The Ultra Secret" in 1974. During WWII, he had supervised the distribution of the "Ultra" intelligence which originated from these machines breaking the enemy's ciphers.

A functioning replica of a Colossus was completed in 2007, and is on display at The National Museum of Computing at Bletchley.

Simon Peyton Jones

Born: Jan. 18, 1958;

South Africa (UK national)

Jones was a major contributor to the design of the lazy functional language, Haskell [Sept 12], and lead developer of the Glasgow Haskell Compiler (GHC). He

Simon Peyton Jones (2016). Photo by Duncan.Hull. CC BY-SA 4.0.

devised Haskell's widely cited unofficial motto: “Avoid success at all costs.”

He's also the co-creator of the C– language, which is used by GHC to encode programs in a form midway between the language-specific front-end and the general-purpose back-end code generator and optimizer.

He's chair of the UK’s Computing at School (CAS) initiative, which he co-founded in 2007. CAS was at the center of the 2014 reform of the English computing curriculum.

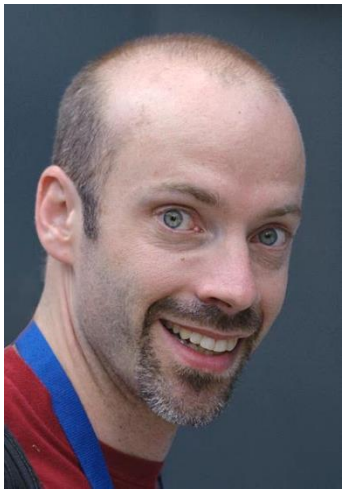
A quote: “When the limestone of imperative programming is worn away, the granite of functional programming will be observed.”

Paul “Rusty” Russell

Born: Jan. 18, 1973;

London, UK (but Australian)

Russell worked on the Linux kernel’s [March 14] networking subsystem, in particular on the packet filtering systems, ipchains and iptables (1998). He also helped specify the directory organization used by Linux distributions. In 2003, Linus Torvalds [Dec 28] called him one of his “top deputies”.



Rusty Russell (2011). Photo by Karora.

He was the main developer of the “lguest” virtualization system (2007), which lets a user run multiple Linux kernels on a host machine.

He implemented (and extended) a large part of the Lightning Network protocol designed by Joseph Poon and Thaddeus Dryja (2015). Lightning supports a peer-to-peer system for making micropayments without having to add all the transactions to a blockchain.

In 2005, he was the first recipient of the (eponymous) "Rusty Wrench" award for services to free software in Australia. As the name suggests, the prize is a rusty wrench propped up on a plinth.

Bill Flips Pancakes

Jan. 18, 1978

Bill Gates [Oct 28] and Christos Papdimitriou (then an assistant professor at Harvard) submitted the paper “Bounds for Sorting by Prefix Reversal” to the journal *Discrete Mathematics*, which was published the following year. The article considers a problem first posed in the *American Mathematical Monthly* (AMM) magazine:

"The chef in our place is sloppy, and when he prepares a stack of pancakes they come out all different sizes. Therefore, when I deliver them to a customer, on the way to the table I rearrange them (so that the smallest winds up on top, and so on, down to the largest at the bottom) by grabbing several from the top and flipping them over, repeating this (varying the number I flip) as many times as necessary.

If there are n pancakes, what is the maximum number of flips (as a function f(n) of n) that I will ever have to use to rearrange them?""

Gates and Papdimitriou derived an upper and lower bound for the flipping function. The upper bound (5/3n) wasn't improved upon until 2009, and then only to 18/11n.

The original AMM article was written by Harry Dweighter (pronounced “harried waiter”), a pseudonym for Jacob E Goodman, a jocular mathematician at New York's City College. Another of his oft-cited articles considers the problem of peeling potatoes with a swivel-bladed vegetable peeler.

David X. Cohen, who went on to write for "The Simpsons" [Feb 15] and Futurama, worked on a related problem while a student at Berkeley. He considered the case when the bottom of each pancake is burnt, and the sort must be completed with all the burnt sides facing down.

In 2009, Papadimitriou and Apostolos Doxiadis co-wrote the excellent graphic novel, “Logicomix: An Epic Search for Truth” about logic at the dawn of the 20th century.

Hartford Coliseum Collapse

Jan. 18, 1978, 4:19am

Just hours after 5,000 fans had left the Hartford Coliseum, its steel-latticed roof collapsed.

Initially the roof's failure was thought to be due to the weight of wet snow lying on it, but the investigation revealed that the roof had started to fail as soon as it had been installed.

Designed and tested with a complex CAD model, the structure consisted of unusual pyramidal trusses. In particular, the roof was supported by just four columns to provide an unobstructed view for every spectator. It was one of the first large-span roofs made possible by computer design and analysis.

Unfortunately, the loads on the model were underestimated by more than 20%. It also included frame bracing that wasn’t actually installed in the real structure, and some of the components were too thin according to building regulations. The end result was

that the roof was extremely susceptible to buckling which unfortunately wasn't a mode of failure considered in the computer analysis.

BGP: A Tale of Two Napkins

Jan. 18-20, 1989

During an Internet Engineering Task Force (IETF [Jan 16]) meeting in Austin, Kirk Lougheed and Len Bosack of Cisco [Dec 10] and Yakov Rechter of IBM designed a new routing protocol.

It became RFC 1105 [April 7], the Border Gateway Protocol (BGP), but is often called the "Two-Napkin Protocol," a reference to the napkins it was sketched out on in a Univ. of Texas cafeteria.

Photocopies of the napkins are stored in Cisco's archives; sadly the originals have been lost.

In 2004 a Turkish ISP called TTNet accidentally advertised bad BGP routes to its neighbors, claiming that TTNet was the best destination for *all* traffic on the Internet. As this routing information was distributed to other systems, a massive disruption occurred, creating a 1-day crisis when many people across the world were unable to access the Internet.

Baidu

Jan. 18, 2000

Baidu (百度) was incorporated on this day by Robin Li Yanhong and Eric Xu Yong. Their first office was located in a hotel room near Peking University where Li had studied.

Baidu is now one of the largest AI and Internet companies in the world. It holds around a 67% share of China's search engine market (Dec. 2020). Originally, it faced stiff competition from Google [Aug 19] but that company's search engine began being blocked by the Chinese government in early 2010.

Robin Li (2011). Photo by Kevin Krejci. CC BY 2.0.

In 1996, Li developed the Rankdex site-scoring algorithm for search engine page ranking [Aug 29], which was awarded a US patent. He later encorporated this technology into Baidu's search engine.

Baidu means "a hundred times", or alternatively, "countless times". It's a quote from the last line of Xin Qiji (辛弃疾)'s classical poem "Green Jade Table in The Lantern Festival" (青玉案·元夕).

In Aug. 5, 2005, Baidu joined the NASDAQ [Feb 8], and the value of its shares rocketed from $27 to $122. In Dec. 2007, it became the first Chinese company to join the NASDAQ 100.

Baidu is often grouped with two other Chinese Internet giants, Alibaba [April 4] and Tencent [Nov 11], collectively known as BAT.

SOPA and PIPA

Jan. 18, 2012

A series of coordinated protests were carried out against two proposed laws being considered by the US Congress—the Stop Online Piracy Act (SOPA) and the PROTECT IP Act (PIPA).

The US already had the Digital Millennium Copyright Act (DMCA [Oct 28]), but it aims to remove unauthorized content. SOPA and PIPA would instead target the websites hosting that material.

The SOPA and PIPA's opponents thought the bills too vague and broad. One frequently mentioned analogy was that it would require the manager of a flea market to shut down the entire arcade because a few of the merchants were selling counterfeit goods.

On Jan. 17, 2012, Jimmy Wales [Aug 7] called for a "public uprising" against the proposed legislation. Several major sites went dark, including Wikipedia [Jan 15], Reddit [June 23], BoingBoing [Jan 21], Mozilla [Jan 23], WordPress [May 27], and ICanHasCheezBurger. Google blacked out its logo and added a link to the online petition. According to the protest organizer ,"Fight for the Future", more than 115,000 websites joined the event.

Motion Picture Association of America Chairman Chris Dodd blasted back that the shutdown was "an abuse of power given the freedoms these companies enjoy in the marketplace today."

More than 8 million people looked up their Congressional representative on Wikipedia, 3 million people emailed Congress to express opposition to the bills, the petition at Google gained over 4.5 million signatures, and Twitter passed around at least 2.4 million SOPA-related tweets.

The voice of the people was heard, and the legislation was postponed "until there is wider agreement on a solution."

For more online activism, see [April 10], [Oct 4], [Nov 5].