Dec. 28th

Leonardo Torres y Quevedo

Born: Dec. 28, 1852;

Santa Cruz de Iguña, Cantabria, Spain.
Died: Dec. 18, 1936

Torres was a gifted engineer and mathematician, known for his chess machines, a very early mechanical computer design, several mechanical calculators, and remote control devices.

Torres constructed the first genuine chess automaton, dubbed “El Ajedrecista” (The Chessplayer) in 1910. (Von Kempelen’s better known "The Turk" from 1769 was a fake [April 00]). It was able to play a king and rook endgame against a king starting from any position.

The base of each piece was covered in mesh which closed an electric circuit when it was placed on a square, and the signal was used to record its position on the board. After the human player had moved the black king, the best move for white was calculated, and the chosen piece was moved by a mechanical arm.

The machine was also able to identify cheating, which it reported by lighting a bulb the first two times, and by terminating the game (with extreme prejudice) after the third violation.

Scientific American published an article about the automaton in 1915, entitled “Torres and his Remarkable Automatic Devices. He Would Substitute Machinery for the Human Mind.”

Torres’ “Essays on Automatics” (1913) included a brief history of Charles Babbage’s [Dec 26] Difference Engine [June 14] and Analytical Engine [Dec 23], and included Torres' own design for an electromechanical Analytical Engine. It could support arithmetic operations on decimal digits using built-in function tables, and was controlled by a program encoded as a pattern of conducting areas on the surface of a rotating cylinder. Sadly the machine was never built, otherwise it would have been the first general-purpose electromechanical computer. As it was, the first was Zuse’s Z3, unveiled on [May 12] 1941, some 25 years later.

Torres did complete several algebraic equation solvers, which he called arithmometers, between 1893 and 1920. The 1920's machine was wired to a typewriter acting as an input/output device, ran under program control, and supported conditional branching.

In 1901 Torres developed a radio-controlled guidance system – called the Telekine – which successfully steered a small dinghy holding eight around Bilbao harbor. However, Nikola Tesla [July 10] just beat Torres in this area, with his Teleautomaton boat demo of [Dec 8] 1898.

John von Neumann;

Neumann János Lajos
(Jansci to his parents)

Born: Dec. 28, 1903;

Budapest, Austria-Hungary
Died: Feb. 8, 1957

Von Neumann was one of the foremost mathematician of his time, and made major contributions to numerous areas of math, physics, economics, and statistics. In computing, his work included the von Neumann architecture [June 30], linear programming, self-replicating machines (cellular automata [Dec 26]), and stochastic computing. He pioneered game theory, and the book he co-wrote with Oskar Morgenstern in 1944, “The Theory of Games and Economic Behavior”, is still a foundational text in that subject.

After a chance meeting with Herman Goldstine [Sept 13] at a railway station, von Neumann became interested in contributing to the ENIAC project [Feb 15] led by J. Presper Eckert [April 9] and John Mauchly [Aug 30]. He joined the group in Aug. 1944, and on [June 30] 1945 released “First Draft of a Report on the EDVAC”. It became a bitter source of acrimony within the team.

John Von Neumann's wartime Los Alamos ID badge photo. (c) Los Alamos National Lab.

In June 1946, Arthur W. Burks [Oct 13], von Neumann, and Goldstine issued “Preliminary Discussion of the Logical Design of an Electronic Computing Instrument”, outlining some of the ideas they wanted to test in a computer being built at Princeton’s Institute for Advanced Study (IAS), that was naturally called the IAS machine [June 10].

His second wife, Klara Dan von Neumann [Aug 18] also worked on the ENIAC and later the MANIAC [March 15].

Von Neumann helped formulate the Monte Carlo method [April 13], numerical code for weather forecasting [Nov 1], merge sort [March 7], and flowcharts [April 1]. According to David Alan Grier, von Neumann was the first person to use the verb “to program” [Sept. 5]. His last work, published in 1958, “The Computer and the Brain”, explored analogies between machines and the human brain.

Von Neumann was a child prodigy; at the age of six, he was

able to divide two eight-digit numbers in his head and converse in Ancient Greek, was proficient in calculus at age eight, and reading Emile Borel's Théorie des Fonctions ("On some points in the theory of functions") at age twelve.

He also had a photographic memory. Once, when challenged, he amazed his friends by reciting Dickens' "A Tale of Two Cities" for fifteen minutes until they begged him to stop. He apparently had read the book once, over twenty years before. Of course, he used his prodigious memory to store more useful things as well, including a massive collection of dirty limericks.

He was known as a fast and somewhat careless driver; his frequent auto accidents led to one Princeton intersection being dubbed the "von Neumann corner." He once emerged from a car accident with this explanation of the event: "I was proceeding down the road. The trees on the right were passing me in orderly fashion at 60 miles an hour. Suddenly one of them stepped out in my path. Boom!"

The IAS management would regularly receive complaints about von Neumann playing extremely loud German march music on the gramophone in his office, distracting those in neighboring offices, including Albert Einstein. In fact, von Neumann claimed to do some of his best work in noisy, chaotic environments such as in the living room of his house with the television blaring.

One story illustrating von Neumann's math skill is how he solved the following puzzle:

"Two trains are on the same track 100 km apart, heading towards one another, each at a speed of 50 km/hour. A fly starting out at the front of one train, flies towards the other at a speed of 75 km/hour. Upon reaching that train, the fly turns around instantly and flies back towards the first train. The fly keeps flying between the two trains as they roar towards each other. How many kilometers does the fly travel before getting squashed in the train collision?"

There's a simple way to get the answer: 75 km. Of course, von Neumann obtained it almost instantly, but admitted that he'd done it by summing the series:

$$75\sum_{n=1}^{\infty}\frac{4}{5^n}$$

"I have sometimes wondered whether a brain like von Neumann's does not indicate a species superior to that of man" — Hans Bethe (Nobel Prize in Physics, 1967).

YouTube has a video of von Neumann, briefly appearing on the NBC show "America's Youth Wants to Know" in the early 1950's, calling for better science education. The boy asking the questions was Bill Walters from Osceola, Arkansas.

Von Neumann was a prominent member of "The Martians", a term jokingly coined by Leo Szilárd to refer to a group of prominent Hungarian scientists who emigrated to the US in the early half of the 20th century. Other members included Paul Erdős [Oct 31], Paul Halmos, Theodore von Kármán, John G. Kemeny [May 31], George Pólya [March 19], Szilárd himself, Edward Teller [March 15], and Eugene Wigner.

The title came about as an answer to the question of why there is no evidence of intelligent life beyond Earth despite the high probability of it existing. Szilárd responded: "They are already here among us – they just call themselves Hungarians."

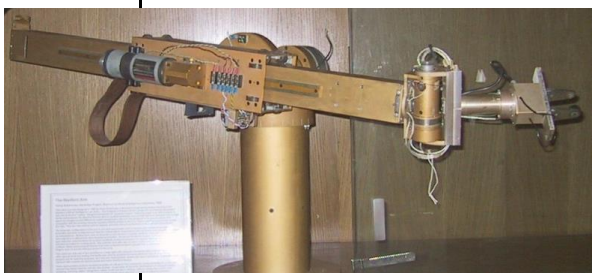
Victor David Scheinman

Born: Dec. 28, 1942;

Augusta, Georgia
Died: Sept. 20, 2016

In 1969, while at Stanford University, Scheinman built the Stanford arm, the first electrically powered, computer-controlled industrial robot with six rotational joints. These allowed it to duplicate the shoulder, elbow, and wrist movements of a human arm. Also, unlike previous machines which could only perform one task repeatedly, the arm was capable of following a series of instructions.

In 1974, a prototype successfully assembled a car water pump using only optical and contact sensors to guide it. This prompted Scheinman to found "Vicarm Inc." to commercialize his work and in 1977 the company merged with Unimation [Dec 10]. The outcome was the PUMA (Programmable Universal Machine for Assembly), which became very popular for automobile assembly and other industrial tasks.



The Stanford Arm. Photo by the Stanford AI Lab. http://infolab.stanford.edu.

Scheinman's other projects included electronic limbs for the disabled, and a programmable hydraulic arm so powerful that the floor of the lab shook whenever it was switched on.

Scheinman's first contact with robots as a boy was traumatic. He was so frightened by Gort in the 1951 sci-fi film "The Day The Earth Stood Still" that he suffered nightmares.

Raymond Mark Holt

Born: Dec. 28, 1944;

Compton, California

Holt and Steve Geller designed the MP944 [Dec 21], at Garrett AiResearch in 1968. It was

utilized in the Central Air Data Computer (CADC) that controlled the F-14 Tomcat fighter.

The MP944 is sometimes called the first microprocessor, along with two other claimants: Bob Booher's D200 [Dec 9], and Lee Boysel's AL1 [Dec 31]. However, all of these required multiple chips to implement a fully functional CPU, and so most historians believe that the honor of first microprocessor belongs to the Intel 4004 [Nov 15].

When Holt first joined Garrett, he had been given the job of converting the electro-mechanical computer in the earlier F-4 phantom (1960) to solid state.

In the mid 1970's Holt and Manny Lemas co-founded "Microcomputer Associates", where he designed the Jolt and SYM-1 microcomputer cards as well as the first microcomputer pinball game, "Lucky Dice". The SYM-1 was employed in the military robots, Robart I and Robart II [Nov 29].

Linus Benedict Torvalds; The 's' was added to "Torvald" by his grandfather.

Born: Dec. 28, 1969;

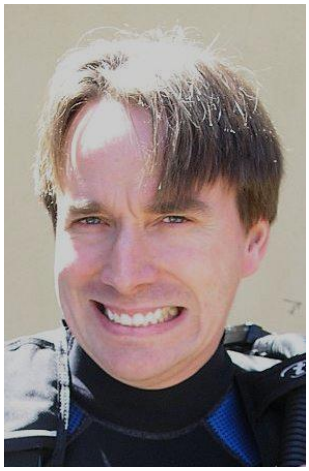
Helsinki, Finland

Torvalds is the principal developer of the Linux kernel, and self-styled "benevolent dictator of Planet Linux". He also created the distributed revision control system, git [Feb 8].

His interest in computers began at the age of 11, when he started writing programs in BASIC on his maternal grandfather's Commodore VIC-20 [May 00]. Later he graduated to machine code to access its 6502 CPU [Sept 16].

In the summer of 1989, Torvalds bought Andrew Tanenbaum's [March 16] book "Operating Systems: Design and Implementation", which described MINIX. At the time Torvalds was a Second Lieutenant in the Finnish army, performing the duties of a ballistic calculations officer. It wasn't until Jan. 5, 1991 that he bought a fast (33MHz) large (4 MB RAM, 40 MB hard disk) IBM PC clone for the purpose of running MINIX and studying it more seriously.

On March 29, 1991, Torvalds posted his first message to the comp.os.minix newsgroup: "Hello everybody, I've had minix for a week now, and have upgraded to 386-minix (nice), and duly downloaded gcc for minix ..."



Linus Torvalds (2008). Photo by Paul Fenwick. CC BY-SA 2.0.

In April 1991, Torvalds started working on his own OS, building a task switcher and a terminal driver. He announced his project in comp.os.minix on [August 25], and posted about the 0.01 version of the kernel on [Sept 17] 1991. Version 1 appeared on [March 14] 1994.

In 2000, Steve Jobs [Feb 24] tried to hire Torvalds, who recalled: "UNIX for the biggest user base: that was the pitch, "but he'd have to drop Linux and work on Mac OS's Mach kernel instead.

Torvalds is known for disagreeing quite fervently with others on the Linux kernel mailing list. He has admitted, "I'd like to be a nice person and curse less and encourage people to grow rather than telling them they are idiots. I'm sorry - I tried, it's just not in me."

Torvalds was named after Linus Pauling, a double Nobel prize winner (for Chemistry and Peace), although Torvalds has said, "I think I was named equally for Linus the Peanuts' cartoon character".

Torvalds love of scuba diving, led to his creation of Subsurface, for dive-logging.

The license plate on his yellow Mercedes SLK has a frame running around the outside which reads "Mr. Linux. King of Geeks." However, the plate itself says "Dad of 3" (he has three daughters).

A few quotes from the man: "This 'users are idiots, and are confused by functionality' mentality of Gnome [March 3] is a disease. If you think your users are idiots, only idiots will use it."

"See, you not only have to be a good coder to create a system like Linux, you have to be a sneaky bastard too."

"Talk is cheap. Show me the code."

"Software is like sex: it's better when it's free."

The LaMacchia Loophole

Dec. 28, 1994

US District Judge Richard G. Stearns dismissed the case against MIT student David LaMacchia who had been accused of using MIT servers to run a BBS offering pirated software.

Although LaMacchia was alleged to have helped other users make illegal copies of software, there was no suggestion that he profited from the activity, and the law only attached criminal penalties to copyright infringement for profit.

In his decision, Stearns wrote that the government's "interpretation of the wire fraud statute would serve to criminalize the conduct of not only persons like LaMacchia, but also the myriad of home

computer users who succumb to the temptation to copy even a single software program for private use."

The dismissal would later be called the "LaMacchia Loophole", and made it quite difficult to prosecute people who circulated pirated software recreationally. Of course, it was closed by the Dec. 1997 "No Electronic Theft" Act.

GIOVE-A Launched

Dec. 28, 2005

The European Space Agency launched GIOVE-A (Galileo In-Orbit Validation Element), a "proof-of-concept" satellite for the Galileo system.

The plan was to create a 24-satellite constellation to offer an alternative to the US's Global Positioning System (GPS [Feb 22]).

In mid-2006 the public/private partnership behind the project fell apart, and the EU nationalized the programme. By early 2007 the project was said to be "in deep crisis", but reallocating funds from the EU's agriculture and administration budgets patched things up.

After the second GIOVE launch, GIOVE-B in 2008, European ministers announced that Galileo would be fully operational by 2013. Of course, that didn't happen.

As of early 2020, 22 of the planned 30 active satellites were useable, and hopes were high that the system would be fully operational by 2021.
