



PROBUS Club of Central Edmonton Newsletter

April 2023

Editor: Ken Hoffman

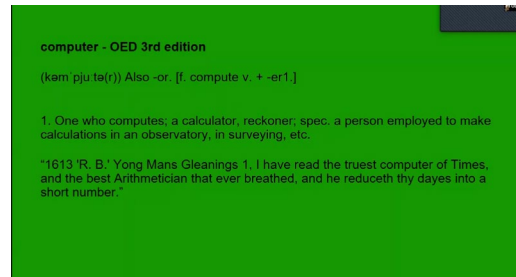
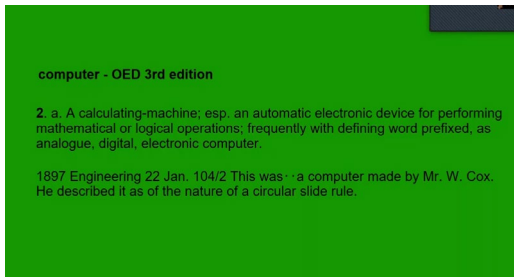
Website: www.probus-central-edmonton.com

Email: probus.cent.ed@gmail.com

April Presentation

Phil Haswell spoke on the history of computers presenting “Computers Technology – The last 2000 Years”. Phil was with the U of A faculty of engineering and has worked on a number of special projects at the University. Phil has an impressive resume’.

He started by noting that computers are pervasive. It started with the first microprocessor and integrated circuit. He also mentioned that in the 1940’s the head of IBM stated that we will only need 5 computers in the world. So, what is a computer? Here are some definitions he supplied:



The start of the computer story was discovered in early 20th century when Greek sponge divers. The divers located a mechanism from 150 B.C. called the Antikythera mechanism. The first image is of the device as found. Next, with improved technology for analyzing ancient artifacts, a computer rendering was done of this device.



Antikythera Mechanism - circa 150 B.C.
Large Gear is Approximately 13 cm in Diameter.



It was determined to be an analog computer. We then saw images of a number of other computing devices including abacus, slide rule and punch card loom.

An important step in the evolution of computers was the invention of the Boolean Algebra. This formed the foundation of the logic circuits in the modern computer. Boolean algebra can be illustrated by simple 3-way switch. It is represented by binary 1 or 0. These can represent true and false, or on or off. Charles Babbage (circa 1860) is considered to be the founder of modern computing. Along with the Countess of Lovelace, he wrote a paper on computer engines. While he designed a

number of computing engineers, he did not build any. People have now built computers based on his design; they work.

Another watershed moment was the building of a punch card tabulating machine for the US Census in the 1890's. Many of us remember the Punch card, these were the major vehicles for programming computers and for holding the data used by computers. Computers played a role in WWII decoding enemy codes. As well, the U.S. built a general-purpose computer to calculate artillery trajectories. Both these types of computers used vacuum tubes. This picture is of the U.S. machine.

In 1925 Julius Edgar Lilienfeld patented the first transistor. It

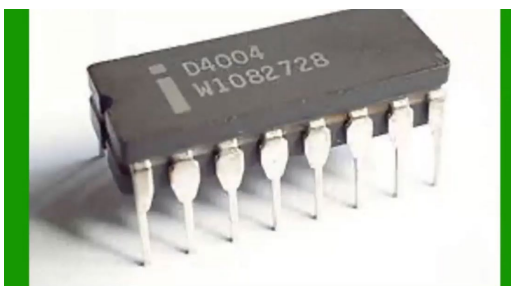
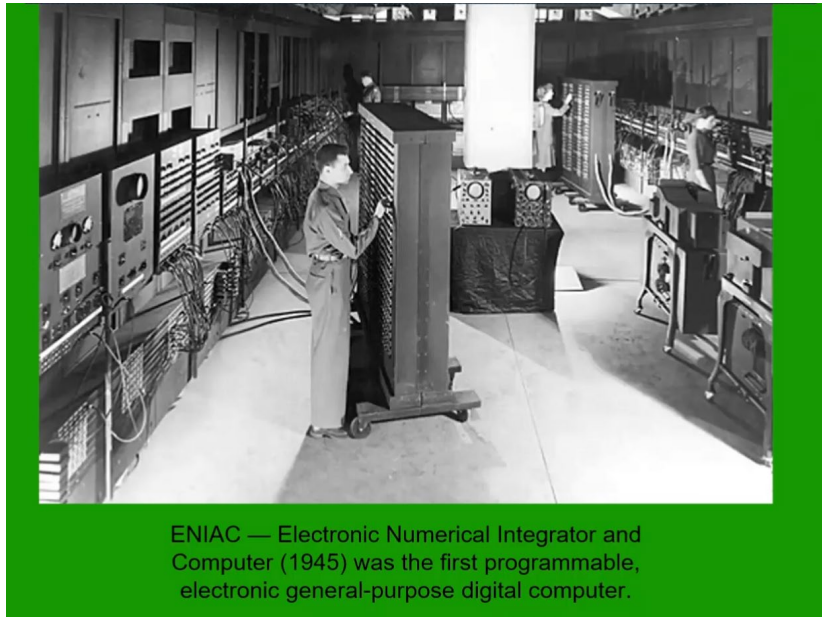
was not built for a number of years. Bell Labs was challenged to develop semiconductors to replace the tubes. Shockley, Bardeen and Brattain invented the first working transistor in 1947. Phil referred to this as a "sea change". The advent of the transistor started consumer electronics with the classic transistor radio in 1954.

Shockley started his own company near Palo Alto California, the area now referred to as Silicon Valley. This was just the start of the explosion of companies based on semiconductors, next was Fairchild which was started by 8 people who left Shockley. Fairchild spawned many companies such as Ebay, Apple, Google, Facebook and many others.

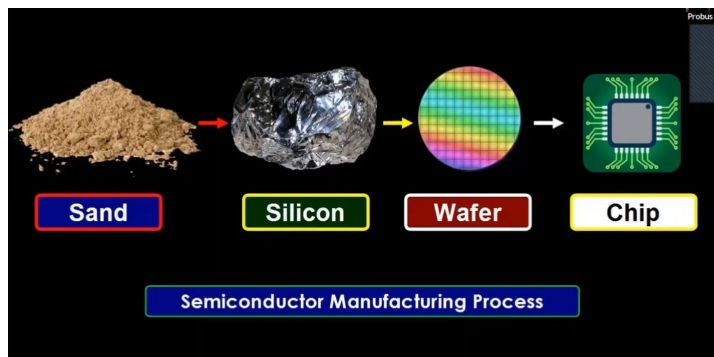
Texas Instruments developed the first integrated circuit in the 1950's. Fairchild developed a different form of integrated circuit in 1961. This was considered to be a major step forward.

Noyce and Moore, inventors of the integrated circuit at Fairchild formed their own company...Intel in the late 1960's. Gordon Moore defined "Moore's Law" this is the idea that number of transistors on a microchip will double roughly every 2 years. These advances came from improvements in silicon lithography.

Intel produced the first microprocessor in 1971, it was the Intel 4004. While Moore's Law has been true to date, we are reaching its limit due to the current microscopic size of transistors on wafers. The following image is the steps in the process of creating a wafer.



The Intel 4004 microprocessor released 1971 became the first general-purpose programmable processor on the market—a "building block" that engineers could purchase and then customize with software to perform different functions in a wide variety of electronic devices.



Computers are now part of many of our machines, each is based on semiconductor wafers. Due to this dependence on semiconductors, they are now significant to geopolitics. China is a major supplier of electronic consumer products in the world. However, they are not able to produce the microchip of the quality they need. Many of these are produced in Taiwan. One just needs to look at the newspaper to see stories of China versus Taiwan. The question is what would happen to availability of semiconductors if China invaded Taiwan. This question drives the U.S. to build up its own microchip manufacturing sector. While China is struggling to build up its own microchip manufacturing. It is handicapped by trade restrictions that a number of countries have placed on it. For example, the U.S. restricts export of high tech to China.

Next in computing is the development of quantum computers. IBM is the leader in this field. A chip must be kept at -273.15 degrees Celsius (Colder than outer space). Keep in mind that in quantum math 1+1 does not necessarily equal 2. Quantum Computers can now solve problems that cannot be solved by any other method. And the story continues with Biocomputers, etc.

Phil wrapped up by pointing out that there 75 million transistors in each of his hearing aids while that Apple Mac has 50 billion transistors...they both cost about \$1,500. We thank Phil for his remarkable presentation of the history of Computers.

Interesting aside:

1. My husband and I were happy for 20 years. And then we met.
2. I, for one, like Roman numerals.
3. When my boss asked me who was stupid, me or him, I told him he doesn't hire stupid people.
4. Every married person should forget their mistakes. There's no point in two people remembering the same thing.
5. My wife told me to stop impersonating a flamingo. I had to put my foot down.
6. I have an inferiority complex, but it's not a very good one.
7. People tell me I'm condescending. (*Leans in real close*) That means I talk down to people.
8. I ate a clock yesterday, and it was very time-consuming.
9. A perfectionist walked into a bar — apparently, the bar wasn't set high enough.
10. A termite walks into the bar and asks, "Is the bar tender here?"
11. Just burned 2,000 calories. That's the last time I leave brownies in the oven while I nap.
12. Always borrow money from a pessimist; they'll never expect it back.
13. I want to die peacefully in my sleep, like my grandfather. Not screaming and yelling like the passengers in his car.
14. Don't you hate it when someone answers their own questions? I do.
15. My therapist says I have a preoccupation with revenge. We'll see about that.
16. I told my girlfriend she drew her eyebrows too high. She seemed surprised.
17. What happens to a frog's car when it breaks down? It gets toad away.
18. What vitamin helps you to see? Vitamin C.
19. Why did the burglar rob a bakery? He needed the dough.
20. Why wouldn't the sesame seed leave the casino? He was on a roll.

Have a Great month – can't wait for May flowers!