



Crabby marks International Women's Day

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Crabby Office Lady

March 8 is International Women's Day. This year, Crabby acknowledges four women who blazed technological trails. Read and be inspired.

Welcome to my column marking International Women's Day (IWD), which celebrates economic, political, and social achievements of women past, present and future. Being an international, technically-inclined woman myself (oh, I'm quite the globe trotter...), I wanted to take this week's column to talk about a few outstanding women who've made contributions in the field of computing and its related technologies.

Making progress

In the early 1900s, there was a lot going on in the world with regard to inventions and the growth of the industrialized world:

- In 1906, the "U.S. Pure Food and Drug Act" passed, heralding the era of safety in food processing and the environment.
- In 1901, the electric typewriter was invented.
- In 1909, talk radio was introduced to the airwaves. Its first topic? Women's suffrage.

That's right: The movement to extend voting rights — suffrage — to women was so hot, even the new medium of talk radio had to take notice. The first International Women's Day occurred in 1911, when more than one million men and women attended rallies campaigning for women's rights to work, vote, be trained, to hold public office, and to end discrimination. Think about that: less than 100 years ago women were still fighting for the rights we take for granted today. (Note that it wasn't until 1920 that women were finally granted suffrage; in 1911, they were just warming up for the fight.)

Women to honor this day (and every day)

There are many women who have contributed to the technological advances and work regarding mathematics, computers, and software. I've chosen four to highlight today.

- One was so influential in this industry that she inspired an entire network of young women who wanted to be like her.
- One made her contributions before our great-great-great grandparents were even born. (Talk about being ahead of her time...and my time, and our parents and grandparents time...)
- One enabled all of us to use the Internet and is still surpassing herself and her previous gifts to this industry.
- One was one of the first women to earn a Ph.D. in Mathematics.

Grace Murray Hopper (1906-1992)

Grace Hopper had such a remarkable career that I almost don't know where to start. During her lifetime, this amazing, pioneering lady was an American navy officer, a mathematician, a professor, and a computer programmer. (In other words, she was no slouch.) Mrs. Hopper had a profound affect on the field of computer development from the 1930s to the 1980s.

In 1944, while in the Navy, Mrs. Hopper worked as a programmer at Harvard University on the Mark I, the first large-scale U.S. computer and a precursor of electronic computers. (This was when computers took up entire floors of buildings.) In 1952, Mrs. Hopper devised the first

compiler, a program that translates instructions for a computer from English to machine languages. During the period of 1957-1961, she helped develop the Flow-Matic programming language and the Common Business-Oriented Language (COBOL) for the UNIVAC, the first commercial electronic computer.

Mrs. Hopper taught and lectured extensively during the 1960s. She worked hard to attract businesses and industry to computers, as well as convince people to try and bridge the gap between management and programmers (a battle which I believe still thunders on). When Mrs. Hopper retired — or, rather, tried to retire — from the Navy in 1966 (having served for 23 years), those guys got on their hands and white-clad knees and begged Grace to oversee the Navy's program to standardize its computer programs and languages. Lucky for us, Grace agreed, and was eventually elevated to the rank of Rear Admiral in 1983. She was finally granted retirement in 1986.

And one more little note about Grace Hopper: A little software company called Microsoft has established the Women@Microsoft Hoppers Scholarship in her honor.

Augusta Ada Byron, Countess Of Lovelace (1815-1852)

Augusta was the daughter of Lord Byron and one of the very few women mathematicians of her time. (This time the apple did fall far from the tree — the flowery poems tree, that is). A student and friend of Charles Babbage, a British mathematician and scientist, Augusta had the job of keeping extensive notes concerning Babbage's ideas and the Analytical Engine (considered the mechanical forerunner of the modern computer).

Unfortunately for Augusta and Charles, the Analytical Engine was never built. However, its key concepts, such as the capacity to store instructions, the use of punched cards as a primitive memory, and the ability to print (in other words, an operating system and software), are applied to modern computers. In fact, Lovelace's programs for the machine led to the naming of a programming language in her honor (ADA) by the U.S. Department of Defense in 1979.

Radia Perlman (1952-)

Dr. Perlman, known as the Mother of the Internet (and every boy must have a mother, Al Gore), is a Distinguished Engineer at Sun Microsystems, Inc. In the 1970s she proposed a solution for routing information (can you say "INTERNET?") which was largely ignored due to — could it be? — her gender. But Dr. Perlman pressed on and eventually had — and continues to have — her say. One of her most useful and highly regarded inventions is the Spanning Tree Algorithm (which is as complicated as it sounds).

Now, I'm no expert at understanding her invention (frankly, I can barely type about it), but as I understand it, the bridge spanning algorithm allows network bridges to connect networks without loops (which are bad; we don't want loops. Loops can result in packet explosion and network crashes, and if those sound bad, rest assured that they are. Exploding packets and crashes are things we don't want, in computers or otherwise).

Dr. Perlman is the author of two widely-used textbooks (*Interconnections: Bridges, Routers, Switches, and Internetworking Protocols*, and co-author along with Charlie Kaufman and Mark Speciner of *Network Security: Private Communication in a Public World*) and was named, in the 25th anniversary edition of Data Communications Magazine, one of the 25 people whose work has most influenced the industry.

Put simply, when you do an Internet search, you can thank Dr. Perlman that you're able to navigate that tangled mess of information, useful and otherwise.

Evelyn Boyd Granville (1924-)

Dr. Evelyn Boyd Granville earned her doctorate in Mathematics in 1949 from Yale University, and was one of the first African American women to earn a Ph.D. in Mathematics. During her career at IBM, she developed computer programs that were used for analyzing orbits (or what is known as "trajectory analysis") in the Mercury Project (the first U.S.-manned mission in space) and in the Apollo Project (which sent U.S. astronauts to the moon).

During her career, Dr. Granville has worked as a mathematician and programmer for a variety of private and governmental agencies, has taught elementary school-aged children as well as college students, and is the co-author of a textbook for prospective elementary teachers.

And many more

Of course, there are many more women who were — and still are — pioneers in the field of computers and related technologies. In addition, because of the relative youth of this industry, influential women are continually spearheading new inventions and advances.

Do a search on the Internet for "women in computing" and you will be amazed at what you find. It may even lead to some inspiration for you to create, invent, and hoe some rows (maybe even Excel rows or Word table rows) of your own.

Now, I have great admiration for anyone who blazes a trail. But when you're a woman trying to make her way — not to mention her mark — in an industry once considered to be one more suited to the opposite gender, well, my admiration goes even further.

But for me, what sets these women apart from others in their field is their dedication to teaching others about their experiences, their inventions, and what they learned (and in some cases continue to learn) throughout their illustrious careers. Ladies, Crabby salutes you.

Several sites and organizations provided me with the information I needed to write this column. Included are:

- [Anita Borg Institute for Women and Technology](#)
- [Biographies of Women Mathematicians](#)
- [Computer Wonder Women](#)
- [Women in Technology International](#)
- [MSN Encarta](#)

"In pioneer days they used oxen for heavy pulling, and when one ox couldn't budge a log, they didn't try to grow a larger ox. We shouldn't be trying for bigger computers, but for more systems of computers." — Grace Hopper

About the author

Annik Stahl, the Crabby Office Lady columnist, takes all of your complaints, compliments, and knee-jerk reactions to heart. Therefore, she graciously asks that you let her know whether this column was useful to you — or not — by entering your feedback using the **Did this article help you?** feedback tool below. And remember: If you don't vote, you can't complain.