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John Cocke

I don't see myself as someone who's particularly interested in computer architecture or compiler design, nothing interests me more than higher level programming. Even though John Cocke is hugely famous for his development of reduced instruction set computer (RISC) architecture and program optimisation technology[1], he managed to have a massive enough impact on the world, and the attitude, to inspire someone like me.

An optimised compiler is one of the key features in today's world, as, for many programmers, speed and efficiency is everything. In fact, Cocke himself must have been one of the computer scientists that thought efficiency was key, since most of his contributions led to him ultimately achieving an increase in compilation and runtime speed. The fact that Cocke had nothing less than a major contribution to compiler design optimisation, in areas such as range checking for arrays, global common subexpression elimination, code motion, operator strength reduction, constant propagation, dead code elimination, and instruction scheduling[2], implies that one of the reasons our code gets compiled fast enough in today's world is because of him. Faster compiling leads to faster testing, and in turn, that would lead to faster code development, so it is futile to argue that he didn't have a significant impact in the world of computer science, even if this is all he contributed.

However, his contributions don't end there. He also made a major contribution to computer architecture, which shows that one man doesn't always have to specialise in just one aspect of computer science. In R. Andrew Heller's words, ''He's one of the few people in the world who can comfortably integrate in his mind all of the different aspects of technology, whether it's software, hardware, solid-state physics or aerodynamics,[3]', and this proves my point further, and shows that he should be an inspiration for all of us to let our minds run wild, even outside our individual fields of specialisation in the future, so that we have an opportunity to contribute in more than just one field or find a field which is better suited to us. At the same time, this would help keep us on top of our game in all aspects of computer science, which proves to be an important element in the world today.

One of the main features of this man that really catches my eye is the fact that he's really into his work, once he's onto something. He is known to be consumed by his work, so much so that he leaves his unlaundered shirts in the filing cabinet and ends up paying through his nose for shares just to end up absent-mindedly leaving them in the trash can.[3] A man driven by interest and curiosity, more than the hope of achieving something, is someone who can inspire anybody to do the best in their field.

His RISC design was aimed to have a simple instruction set in which all instructions run in one clock cycle, and he worked on it to achieve optimisation. He encountered some difficulties on the way, but led to creating strange concepts like

[1] http://www.computerhistory.org/fellowawards/hall/john-cocke/

[2] https://amturing.acm.org/award_winners/cocke_2083115.cfm

[3] https://www.nytimes.com/1990/06/26/business/a-maverick-scientist-gets-an-ibm-tribute.html

"delayed jumps" to increase efficiency, which is although at first unappealing to orthodox minds, seems to be the best solution to avoid inefficiency. This shows that he never gave up easily, and let his curiosity drive him.

He is known to resist claiming credit for many of his ideas[3], which suggests that he stays humble even after accomplishing more than what most humans could. This humility is what helped him to learn more from others, and he let his curiosity guide him more than his ego. In my mind, he has definitely set an example for us to keep learning, stay humble and never stop going further and pushing the boundaries, which seem to be limitless in the side of computer science, because no amount of discovery or contribution to this field is enough. Despite several serious health problems in past years, he was still active at the company[3], and it proves how single-minded and focussed he was into his work.

When he was about 35, he had a chance to work in the laboratories of I.B.M. Corp[5], with legends like Frederick P. Brooks, and soon his work received recognition and he was named an I.B.M. fellow.[4] His competitive nature, curiosity, and will to take on challenges in not only one, but many fields, is what would push him further and cause him to accomplish a great deal in the computer science and engineering industry. I seem to like this point of his, as I too have experienced that taking on tasks as a challenge keeps me engaged in my work, and strengthens my will to accomplish more.

One of my favourite quotes from him is - "If I see an opportunity, I drop all the rules, even when doing so is probably a mistake."[1] His motivation to take risks and go in a completely diverted path is what opens up the world to new possibilities, in the aspect of computer science and also shows that he is fearless. His risky approaches are highly likely to lead to a mistake, but he claims that he enjoys discovering his mistakes because "that is when you learn something".[5] "A self-motivator, he does not feel acceptance or acclaim are important for motivation,"[5] and although he was aware about how strange or "out of the norm" others thought his ideas were, that wouldn't be enough to make him resist the urge of making new discoveries and quenching his thirst for ideas of what is possible.

Dr Cocke recalls his favourite project being one which was about a decade long, in I.B.M., which was aimed at developing a computer for scientific applications that would be 1,000 times as fast as the fastest existing machine, called the Advanced Computing System.[3] He took most pride in that project, which was then turned down by I.B.M., and he still stuck to his position of viewing this project as one of the most important projects and claiming that they did things that hadn't been done elsewhere in the computer industry then.[3]

Burning out was never a possibility for Cocke[5], since he did whatever he was passionate about, and even the brightest minds get burned out after working constantly on a single problem that they haven't been able to surpass. Cocke, however, proved to be

[4] https://www.britannica.com/biography/John-Cocke

[5] http://history.computer.org/pioneers/cocke.html

persistent and is said to have been “coming back to the same bone later, like a dog worrying about his bone.”[3]

These qualities of Dr. Cocke, curiosity, humility and persistence, is what makes a man successful as well as happy, according to me, and this is what led him to accomplish about 22 patents[5] and also win the Turing award (now dubbed as the “Nobel Prize”) from the Association for Computing Machinery, which was, and still is, the group's highest honour for technical contributions in computing.[5]

Cocke has shown, that letting curiosity and interest drive you, and taking on challenges, can make us succeed, more than letting the idea of success drive us. Not taking no for an answer and being persistent with respect to solving a problem is one of the main strengths he had. Even though he was smart, as a chief scientist of IBM pointed out, - “he is one of the very few people I know whose IQ is higher than his blood cholesterol level”[5], his ability to remain humble helped him to learn from others and reach for the stars. The humility from such a great scientist is enough to humble us all, and we can take that lesson from him. Most of all, I think we can also learn from his fearlessness, and taking paths out of the norm to discover new things, and if every one of us tried to do this, I believe that the world of computer science would accelerate at a much greater rate than ever before, in directions we couldn’t even imagine. John Cocke was truly one of the greats who had a major impact in the field of compiler optimisation, computer architecture, and much more in the spread-out fields of computer science, and not many have surpassed his level of contributions to the world of technology.

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