Hidden away in Murrayville New Jersey there is a place called Bell Labs. It is a technology research facility renowned for its innovation. Between them members of the institution have 8 Nobel prizes and five Turing awards. It is here that the transistor was invented along with the laser and radio astronomy but most importantly for this essay Unix and C.

I have chosen to write my essay on Dennis Richie. Dennis is perhaps one of the most important men in software engineering history. Richie is best known for his invention of the language c and his work on Unix both astronomically important and vital to the world we know today. “There's that line from Newton about standing on the shoulders of giants. We're all standing on Dennis' shoulders.” – Brian Kernighan (Richie’s partner on writing the first book on C).

Dennis MacAlistair Ritchie was born in Bronxville New York on September 9th 1941 to Jean McGee Ritchie and Alistair E. Ritchie. Alistair was a researcher at Bell labs and author of a book on switching circuit theory. Bell labs was a research facility owned by AT&T. Richie moved to New Jersey and grew up there and attended Summit high school. Richie attended Harvard university and got a degree in Physics and Applied Maths and followed it up with a PHD in the same subject. In 1967 Richie started working in Bell Labs. Its here he begins working with Ken Thomson. Thomson wrote the language B. This was the precursor to C and the bedrock that Richie built upon.

At this time Bell lab is working on an operating system called MULTICS along side GE and MIT Bell labs pulled out of this endeavor in 1969 however Thomson did not want to give up. He went on to build Unix from the ashes of this project. Using an old Digital Equipment Corp. (DEC) PDP-7 Thomson wrote the OS in a month while his wife and child were away. Unix was originally written in B but in 1972 Version 2 was built in C a language written by Richie to improve upon B. The rewriting of Unix in C allowed it to be ported to other machinery much more easily. It could now be done with the replacement of just a few lines of code. This made it much more valuable and useful.

Unix was originally designed so Ken Thomson could run a game he designed called space travel. The game cost around $75 per play on the big computing machines so Thomson ported it the small computer. The system he used to save games is the original root of Unix. It was the word processor in Unix however that secured it more funding as it was immensely useful to the patent department.

The second ACM Symposium on Operating Systems Principles was held in Elmsford, NY in 1973, and Thompson and Ritchie attended and presented an excellent paper describing Unix. The Unix system presented in the paper was elegant and simple, providing a useful and extensible multi-user programming environment on an affordable machine. The file system and libraries included with the system made it easy to build and share application programs and to augment the system's functions. By the end of 1973, there were over 20 Unix systems running.

Thompson and Ritchie, along with other Computing Sciences Research group members, continued the development of Unix and C at Bell Laboratories, and Unix use spread further within AT&T. The Sixth Edition, released in 1975, began the spread of Unix to university, commercial, and government users of the popular DEC PDP-11 computers. AT&T, forbidden by court decree from selling Unix, licensed it for the cost of media. Enthusiastic users had the source code available, and fed improvements to Unix back to the Bell Labs developers. A 1977 retrospective paper by Ritchie said that there were more than 300 Unix installations running on configurations from a single-user DEC LSI-11 to a 48-user PDP-11/70. By 1978, there were over 600 Unix installations, and Unix had begun to be ported to other minicomputers.

"A powerful operating system for interactive use need not be expensive either in equipment or in human effort," Ritchie and Thompson would write five years later in the Communications of the ACM (CACM), the journal of the Association for Computing Machinery. "[We hope that] users of Unix will find that the most important characteristics of the system are its simplicity, elegance, and ease of use."

In 1978 Richie and Kernighan wrote a book called *The C Programming Language*. This book is still widely in use today as it was written by the Author of the language. The book is sometimes referred to as R&K after the two authors. This made the language accessible to all and allowed the developers to inform people on the new changes to the language.

Ritchie became head of the Bell Laboratories Computing Techniques Research Department in 1990 and, with others, began the Inferno distributed operating system and the Limbo language in 1995. Inferno is designed to support applications such as television set-top boxes and advanced telephones.

Richie stayed working in Bell labs until the mid 1990’s when he was transferred to Lucent Technologies, where he retired in 2007 as head of System Software Research Department. Richie died on October 12 2011 at the age of 70.

Over the course of his life Richie won many prestigious awards but the most impressive is the Turing Award which he won in partnership with Ken Thomson in 1983. The Turing award is generally regarded as the highest honor in the field of computer science. Richie and Thomson won this for their work on Unix.

The Unix OS is extremely influential in the world of software being the ancestor of most of the popular operating systems. Mac OS is the most common directly related operating system today. This is due to the system of multi users which was ground breaking in a time where computers were hard to come by and outrageously expensive. Unix was made so as any man whether college student or scientist could easily use it.

Richie’s biggest impact to the world of computing had to be his development of C. Even today well over 45 years since its conception the language is still present in the source code of most devices used today. As Dennis said “C is quirky, flawed, and an enormous success.”

Without Richie the world of computer science would be vastly different. His work facilitated the creation of most of the products we use today and has had a lasting impact.

<https://www.infoworld.com/article/2632713/unix/unix-turns-40--the-past--present--and-future-of-a-revolutionary-os.html>

<https://www.youtube.com/watch?v=tc4ROCJYbm0>

<http://www.unix.org/what_is_unix.html>

<https://www.theguardian.com/technology/2011/oct/13/dennis-ritchie>

<https://www.wired.com/2011/10/thedennisritchieeffect/>

http://www.economist.com/node/2724348

<https://www.bell-labs.com/usr/dmr/www/bigbio1st.html>

<https://www.bell-labs.com/>

http://amturing.acm.org/award\_winners/ritchie\_1506389.cfm