

ONCE UPON A TIME.....

ISAAC NEWTON THE MAN

By: Sdr. K.H. Man, Standing Committee on Publications



"If I have seen further it is by standing on ye shoulders of Giants."

– Sir Issac Newton

Issac Newton's "shoulder of giants" quote is often misunderstood. The quote wasn't original, and Newton wasn't complimenting anyone. In fact, the quote appears in a letter to rival Robert Hooke, and is a cruel put-down aimed at Hooke's physical deficiencies.

For such a colossal figure, it is astonishing that so many people know so little about the real Issac Newton. Scientists and engineers of today owes much to the foundations laid by Newton, but all that is taught to students in schools and universities is a perfect, mythical figure. Pure genius on a pedestal, unattainable by mere mortals.

Yet Newton was a human being. Portraying Newton as a demigod of science is a disservice to young people everywhere. Issac Newton was a flawed man; knowing he was flawed does not detract from his greatness. By knowing the man a little better, Newton becomes a real, accessible person instead of an omnipotent caricature.

Childhood trauma did much to shape Newton's character. His mother Hannah was a widow before Newton was born, and her next husband compelled her to leave young Issac, aged three, with his grandparents. Having lost his mother, Newton didn't get along well with his grandparents, and developed into an insecure and angry, if inquisitive, boy. One wonders if Newton would be less obsessed and driven by the need to seek knowledge and status if his childhood wasn't disrupted. It also resulted in a dark side of introversion, paranoia, rage and vengeful wrath.

Newton the boy was fortunate to be constantly surrounded by books from an early age. John Bate's *The Mysteries of Nature and Art* was an early favourite. Newton was soon adept at building machines and devices detailed in the book. His mechanical skills would later stun his fellow Royal Society peers when he built the first practical reflecting telescope with his own hands. Newton also had the opportunity to fiddle with chemistry when he stayed with the Clark family who owned an apothecary shop while attending school. The supreme experimentalist had an early start.

His thirst for knowledge having been stoked in school, Newton was indifferent to farming, to his mother's dismay. Relatives who recognised his potential pulled strings to get him into Cambridge.

If anything, Cambridge provided the foundation for the genius of Newton to bloom. Newton was determined to make an impression, to ease his insecurity. While at Cambridge, he also became a gentlemen of independent means by engaging in money-lending. So Newton was once a small-time loan shark...

He was, however, an indifferent student, doing just enough for adequate grades but studied obsessively whatever he fancied. Newton devoured book after book, laying the mathematical and philosophical foundation for his later work. The second class bachelor's degree Newton would eventually receive was considered a disgrace by his peers.

In 1663, an extremely significant event occurred. Something clicked in Newton's brain during a lecture. Newton wrote: "I am a friend of Plato, I am a friend of Aristotle, but truth is my greater friend." Somehow Newton stepped back and began to question everything he knew or was being taught. He became a seeker of knowledge, and put forth many questions in notebooks because he wanted to clarify matters for himself.

When Cambridge closed in 1665 due to the plague, Newton returned home and, working in isolation for two amazing years, laid the foundation for optics, mechanics and gravitation.

Newton was so far ahead of his time that twenty years later Hooke was trying to disprove Newton's results by way of casual observation and speculation, producing a nasty feud in the process. Newton exacted revenge by completely deleting all mention of Hooke from the *Principia* and harboured ill will towards Hooke even after the latter's death.

The story of the apple is likely false, a myth. It is more appropriate to set his discoveries in light of his scientific growth and development. Newton, in trying to secure his image for posterity, spread the anecdote among his fawning admirers just before his death. ■

VIRUS OR MAMMAL?

By: Sdr. Chow Chee Meng



Peavy, Rowe & Tchobanoglous in the introduction to their textbook on environmental engineering wrote:

"In a natural state, earth's life forms live in equilibrium with their environment. Humans alone have the ability to gather resources from beyond their immediate surroundings and process those resources into different, more versatile forms. These abilities have made it possible for human population to thrive and flourish beyond natural constraints."

To me, the words "equilibrium" and "abilities" above seem to be contradictory. Are we humans living in equilibrium with our environment? The answer seems to be no. It seems that our ability (or curse) to thrive and flourish beyond natural constraints have caused grave consequences to the environment and have upset the balance of nature. So are we a part of the system that maintains the equilibrium or are we a disturbance, bringing the system into chaos and collapse?

In the recent Matrix trilogy show, the bad guy Agent Smith made a very interesting comment on the human species when he was interrogating our hero Neo Morpheus. He questioned the rationale of classifying human as mammals because all other mammals maintain equilibrium with nature. However, humans tend to multiply and multiply, consuming every bit of resources to satisfy their own needs. According to Agent Smith, humans belong more appropriately to the class VIRUS. A virus infects a living organism, multiplies and consumes the host until it is useless before jumping onto the next host. But we only have one Earth!!!

So are we virus or mammal? (Author's note: I know that there is more to classifications of life forms than just the above simple comparison and virus is not even classified as pure living organisms. But let's just leave it at that for the sake of discussion.) As a young engineer, that question certainly leaves me wondering about the role of engineers towards our environment. Are we doing more good or more harm? After much

soul-searching, I realised that engineers play a very big role in maintaining the delicate balance of our ecosystem. Engineers must realise the huge role they play in providing various basic needs to the public at a minimal impact to the environment. Engineered solutions are naturally more environment-friendly than non-engineered solutions. For example, imagine a housing development being designed and built using non-engineered solutions. Surely, the materials used and the damage to the environment will be many folds greater. One may argue that the trees that have been cut down and the effect to the environment can be prevented if it had not been built at all. Yes, if all of us are willing to go back to the Stone Age and live in caves. What are we trying to do is simply to balance our basic needs with that of the environment, i.e. move towards sustainable development. Therefore, we engineers are actually playing the role of the shepherd, guiding all of us to be like a mammal instead of being a virus. That is surely not a simple task and who says engineering is not a noble profession. Being an engineer, we must not forget our responsibilities towards the environment and that we are only just a part of it. As the Chief Seattle, Dwanish Tribe, 1854 puts it:

"We do not weave the web of life, we are just a strand in it. Whatever we do to the web, we do to ourselves."

I am not overlooking the important roles played by other professions and I believe there are other much better interpretations of the roles of engineers towards the environment than what I have just given above. I am merely trying to remind myself and other young engineers like me of the important roles of engineers and to motivate myself to be a better engineer before I "lose" myself amidst the rat race and turns into a virus.

In conclusion, we all have a choice: to be a mammal or virus? The decision is up to us. ■