

Remembering Sir Clarke and Prof. Lorenz

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Technology has its critical place in human society. With their new ideas and discoveries and writings, scientists and writers bridge the gap between the knowledge of science and its understanding in society. *In death of Arthur C. Clarke (1917-2008), scientific community has lost one of its critical cheerleaders and a space optimist.* Professor Edward Lorenz, who died in April 2008, is regarded as the Father of chaos theory.

The ideas and innovations promulgated by both these great minds have left a profound impact on the development of various technologies. It would be difficult to directly identify their contribution towards development of various defensive technologies to be used as prevention against biological and chemical weapons. However, their work has indirectly impacted much of the happenings in the arena of biological and chemical weapons. *Biological and chemical weapons find mention in Clarke's work, like The Final Odyssey (1997), the fourth and final book in the Space Odyssey series.* Prof. Lorenz, a meteorologist, used computers to increase the precision of weather forecasts. Based on this discovery, the idea of plum models for the dispersion of chemical and biological agents was developed.

Sir Arthur Charles Clarke

With the demise of Sir Arthur Charles Clarke in Sri Lanka on March 19, 2008 an era of space optimism appears to have come to an end now. His work is usually regarded as an optimistic view of science, empowering man's exploration of his solar system and even beyond. Besides, his domain remained not only extrapolating about humanity's technological abilities, but also exploring all the possibilities of interface between science and society. With his death, world has lost a passionate champion and promoter of scientific thought who invoked scientists to play a greater role in public policy and demanded also that political leaders world over must take science seriously.

A science fiction writer par excellence

While Clarke had a few stories published in certain Fanzines between 1937 and 1945, his first professional sales appeared in 'Astounding Science Fiction' under the editorship Johan Campbell in 1946: "Loop-hole" was published in April, while "Rescue Party", his first sale, was published in May. He briefly worked as Assistant Editor of Science Abstracts (1949) before devoting himself to writing full-time from 1951 onward.

As a science fiction writer par excellence, his recurrent themes included humans evolving into a space-faring species and making contact with aliens. But as a practitioner of science he never accommodated ideas that lacked a serious scientific approach in almost all of his science fiction works. In an essay in *Science*, he warned, "For more than a century science and its occasionally ugly sister technology has been the chief driving forces shaping our world. They decide the kinds of futures that are possible. Human wisdom must decide which are desirable."

Clarke often used his stories to caution humanity against many forms of undesirable futures for us earthlings. He imagined supercomputers taking control as HAL in '*2001: A Space Odyssey*' and the extermination of life on earth by nuclear warfare, asteroid impacts or climate change. He had a solid grounding in physics and mathematics, and a deep understanding of societal concerns of science and vice versa in today's world. Attributes like such helped him in becoming an effective, dependable communicator of science, especially on space travel, communication technologies and futuristic scenarios.

Clarke's great legacy constitute among other things his unbound inspiration to generations of space explorers, software engineers and 'technopreneurs'. He triggered the globalisation of information-some sort a state of a global village, 'Vasudhaiv Kutumbkam' [The whole world is a family as the oft repeated quote from Indian scriptures pronounce] by proposing the geosynchronous communications satellite way back in 1945 — satellites that circle the earth at the same speed as the earth itself is turning, and therefore appear to stay in a fixed position. The concept was published in 'Wireless World' in

October that year. In recognition of his contributions the geostationary orbit 36,000 kilometers (22,000 mi) above the equator is officially recognised by the International Astronomical Union as a "Clarke Orbit".

As we know today this idea having transformed into reality catering to the needs of all satellite based communications and the web communication also has become an integral part of the epoch making technology. But alas, Clarke could not even think of patenting the idea and had he done it he would have earned millions out of that very idea. But weep not readers, he nevertheless became a millionaire in his life time and spent a life no less than a tycoon.

Clarke as a crusader against anti- science beliefs

Clarke was a die hard crusader against all sort of unscientific claims, anti-science beliefs and superstitious practices, from creationism and scientology to astrology and fire-walking. In these endeavours he joined other campaigners including Carl Sagan, Stephen Jay Gould and the magician James Randi. He made a modest living as a professional skeptical enquirer. He hosted many television series that probed and even exposed numerous mysteries, superstitions and the paranormal. Also, he time and again challenged astrologers to explain rationally the basis of their work. Though the challenge was always avoided, and astrology continues to exercise much influence over politics, public policy, business and everyday life in Sri Lanka. Yet he never gave up the struggle for rational discussion and debate in public affairs, and remained outspoken till the last breath of his life.

While accepting the Kalinga Prize for Popularization of Science, 1961 by UNESCO in New Delhi in 1962, he iterated, "Two of the greatest evils that afflict Asia, and keep millions in a state of physical, mental and spiritual poverty, are fanaticism and superstition. Science, in its cultural as well as its technological sense, is the great enemy of both; it can provide the only weapons that will overcome them and lead whole nations to a better life."

Born in Mine head, Somerset, England he immigrated to Sri Lanka in 1956 largely to pursue

his interest in scuba diving and lived there until his death. He served in the Royal Air force as a radar instructor and technician during 1941-1946, where he proposed the most talked about satellite communication systems in 1945 which won him the Franklin Institute Stuart Ballantine Gold Medal in 1963 along with a nomination in 1994 for Nobel Prize. He was Chairman of the British Interplanetary Society from 1947-1950 and again in 1953.

Visionary Clarke

Though his story “The Sentinel” [1948] was rejected for a BBC competition it changed the course of Clarke’s career. It formed the basis for ‘A Space Odyssey’. Clarke’s later works feature a technologically advanced but prejudiced mankind being confronted by a superior alien intelligence. Quite interestingly, in one of his novels, ‘Fountains of Paradise’ he conceptualized ‘space elevators’ in the lines of similar legendary efforts by demon king of mystical Lanka, Ravana who is said to have tried for establishing a ladder leading to heaven from earth. His ‘Childhood’s Ends’ is considered as best novel by some critics. Clarke had a fascination with the paranormal and stated that it was part of the inspiration for *Childhood’s End*. He signed in the early 1970s a three-book publishing deal, a record for a science-fiction writer at the time. ‘Rendezvous with Rama’ came out to be the first in 1973, which won him all the main genre awards.

He left written instructions for his funeral which stated:

“Absolutely no religious rites of any kind, relating to any religious faith, should be associated with my funeral.”

Professor Edward Lorenz

Professor Edward Lorenz, meteorologist and mathematician died at the aged of 90 on April 16 2008. Father of modern chaos theory he became a midnight celebrity with his talk entitled, “*Predictability: Does the Flap of a butterfly’s wings in Brazil set off a tornado in Texas?*” He first published his work on chaos theory in the early 1960s, but it was this talk he gave in 1972 which brought him wider attention. As a child he was always fascinated by the weather and natural

phenomena – an interest which he retained throughout his life. He writes in his autobiography, “*As a boy I was always interested in doing things with numbers, and was also fascinated by changes in the weather*”.

Professor Edward Lorenz was born on May 23 1917 in West Hartford, Connecticut and educated at Dartmouth College and Harvard University. His chaos theory caused an impact worldwide but amazingly much before to it Jagdish Chandra Bose wrote a story on a similar theme which is credited to be the first true science fiction story written in Bengali. Published in 1896 and entitled, “Palatak Toofan” [absconded tempest] the story described how a severe surge of the sea could be appeased by even a drop of oil and could save a ship. In similar vein Edward Lorenz, showed how small actions could lead to major changes, what is now usually referred to as the “butterfly effect”. He figured out in the 1960s that small differences in a dynamic system such as the atmosphere could set off enormous changes.

Having earned degrees in mathematics from Dartmouth College in 1938, from Harvard University in 1940, and degrees in meteorology from MIT in 1943 and 1948 he served as a weather forecaster for the U.S. Army Air Corps in World War II. By showing that certain deterministic systems have formal predictability limits, Lorenz put the last nail in the coffin of the Cartesian universe and fomented what some have called the third scientific revolution of the 20th century, following on the heels of relativity and quantum physics. He was a perfect gentleman, and through his intelligence, integrity and humility set a very high standard for his and succeeding generations. He won the Kyoto Prize for basic sciences in the field of earth and planetary sciences in 1991.

“Lorenz made his boldest scientific achievement in discovering ‘deterministic chaos,’ a principle which has profoundly influenced a wide range of basic sciences and brought about one of the most dramatic changes in mankind’s view of nature since Sir Isaac Newton.” the prize committee said.