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The Late Dr. Rakkitha Sirimal Bandara Wickremesinghe, or Dr. Siri Wickremesinghe as we called him, was born on 28th November 1937 to Dr. Artie and Helen Wickremesinghe. He had his education at Royal College Colombo and obtained his MBBS in 1963 from the Faculty of Medicine, Colombo.

He started his medical career in the dermatology unit at Kandy and thereafter joined the Medical Research Institute (MRI) to work in the department of Microbiology. He obtained the Diploma and Master of Science in Microbiology from the University of Manchester, and MD with Board Certification in Microbiology from the Postgraduate Institute of Medicine, University of Colombo.

He continued to work at MRI as the Consultant Microbiologist until he left to Australia with his family. Having worked as a successful microbiologist in the Fairfield Hospital in Melbourne, he came back to the MRI and continued as the Consultant Microbiologist in charge of the Bacteriology division until his retirement. He was

the Director of MRI from 1996 to 1998. After retirement he worked as the Resident Pathologist and Laboratory Manager at Durdans Hospital, Colombo.

He was a past President of the Sri Lanka Collage of Microbiologists and the Secretary to the Board of Study in Microbiology at the Postgraduate Institute of Medicine at the very early stages, during a difficult time when the board was established.

He passed away on 08th April 2003.

Dr. Siri Wickremesinghe was a well-read person who had a vast knowledge in many other subjects, in addition to Microbiology. His knowledge in history, especially on Mahavamsa, was amazing.

Therefore, as a tribute to his multi-faceted knowledge, I thought that it would be most appropriate to select a topic so close to his heart, and to mine, to deliver the Siri Wickremesinghe memorial oration – 2014.

NOTES OF A MEDICAL MICROBIOLOGIST

A JOURNEY THROUGH HISTORY, RELIGION, MYTHOLOGY AND EVOLUTION

King Seethawaka Rajasinghe and the cause of his death

King Seethawaka Rajasinghe, born in 1544, is considered as a great warrior. He came to the battle field at the age of 16, and fought against the Portuguese invaders. Although he was a fearless fighter who faced Portuguese with great courage, he used brutal methods to punish people. He suspected everyone and showed no compassion towards anyone and even killed his own father Mayadunne.

In later years, he became very close to Aritta Kee-Vendu, an Indian emigrant, and destroyed Buddhist temples and killed Buddhist monks. Gradually he became very unpopular. His last battle was with the King Wimaladharmasurya in Kandy. King Seethawaka Rajasinghe lost the battle and, while retreating, came to Pethangoda Uyana, which is situated on the Anguruwella – Warakapola Road in Kegalle district. There he fell down from the horse and sustained an injury. A bamboo prick pierced his leg and after a few days he died. Thus a legendary life came to an end.

Dr. Philip G Veerasingam, FRCS Ed, MA analyses the reported signs and symptoms that preceded the death of King Rajasinghe of Sithawaka and draws the conclusion that he died of tetanus (1).

Dr. Ruwan M Jayatunge, analyzing the behavior of Seethawaka Rajasinghe, came to the conclusion that he was suffering from combat related Post Traumatic Stress Disorder (PTSD) (2).

Black Death

"They ate their lunch with friends and dinner with their ancestors in paradise"

– Giovanni Boccaccio

The Black Death was one of the most devastating pandemics in human history, resulting in the deaths of an estimated 75 to 200 million people and peaking in Europe in the years 1346 – 53. Although there were several competing theories as to the aetiology of the Black Death, analysis of DNA from victims in northern and southern Europe published in 2010 and 2011 indicates that the pathogen responsible was the *Yersinia pestis* (3).

Plague was introduced into Europe from Asia in the 13th century. After the last major epidemic in England in 1665, plague disappeared spectacularly from Europe. This may be due to the displacement of the black rat, *Rattus rattus*

by the brown rat, *Rattus norvegicus*. Although this brown rat is susceptible to plague, it does not commonly frequent human dwellings. Improvement in housing may also have played an important role in the elimination of plague from Europe.

In Sri Lanka, the first documented outbreak of plague was reported by Aldo Castellani in Colombo, in 1908. The last recorded outbreak was in Colombo and Kandy in 1932. Since fumigation of food cargoes was commenced in the port in early 1940s, there have been no cases of plague reported in the country (4).

In 1994, an outbreak of plague occurred in Surat in Gujarat state, India. This was linked to the earthquake that devastated Gujarat that year, and the changes in the environment led the wild rodents to enter villages and cities. Strict anti-rodent measures have reduced the incidence of urban plague. However, endemic foci of wild rodent plague continue to exist in many rural parts of the world. In July 2014, it was reported that a Chinese city has been sealed off and 151 people placed in quarantine after a man died of bubonic plague (5).

Sweating sickness

This was a mysterious and highly virulent disease that struck England, and later continental Europe, in a series of epidemics beginning in 1485. The last outbreak occurred in 1551, after which the disease apparently vanished. The onset of symptoms was dramatic and sudden, with death often occurring within hours. Anne Boleyn, the second wife of King Henry VIII and the mother of Queen Elizabeth I, is thought to have suffered from sweating sickness. Later she was executed by Henry. William Carey, the husband of "The Other Boleyn Girl", Mary, is among those died of sweating sickness. Interestingly, sweating sickness seemed to be more virulent among the higher classes in contrast to plague.

Though its cause remains unknown, it has been suggested that sweating sickness is an infection with Hantavirus which can progress to Hantavirus pulmonary syndrome, which can be fatal (6).

Roman fever

At its height, the Roman Empire stretched from Scotland in the northern hemisphere to the deserts of Africa in the south. The empire lasted for over 500 years, although its eastern part lasted for several more centuries. Roman fever during the fifth century AD may have contributed to the fall of the Roman Empire.

While there are several mentions of a disease sounding very similar to malaria in historical documents from Roman times, there has never been any hard evidence of its presence. In 2011, BBC reported that, for the first time, a British scientist proved conclusively that the most dangerous type of malaria was a killer in imperial Rome. The malarial DNA from a Roman site, dating from around AD 450, is the oldest definite evidence of malaria in history. The finding of malaria was a remarkable and complicated piece of detective work, which spanned the last several years (7).

Thun Biya (the three fears) in Visala Maha Nuwara

About 2570 years ago, during the time of Lord Buddha, residents of Visala Maha Nuwara (The Great City of Visala) faced three fears, namely, famine, diseases and demons. Their sufferings were relieved after Lord Buddha visited Visala Maha Nuwara and chanted Rathana suttra.

Girimananda sutra describes different ailments that can affect a human being, and it gives the clue that the diseases that spread in Visala Maha Nuwara are most probably the infections like smallpox, chickenpox, measles and diarrhoeal diseases (8).

Christ and Leprosy

Leprosy patients in Christ's time were required to live outside the city and yell "leper" anytime people came near, so they would not get close. They were left to live on their own and to die a slow death.

Jesus was compassionate to those who suffered from leprosy and showed that he cared about even the people that were considered the lowest on the social scale. He cared about them physically and spiritually. Jesus cleansing a leprosy patient is one of the miracles of Jesus in the Gospels, namely in Matthew 8: 1-4, Mark 1:40-45 and Luke 5:12-16. Patron saints are chosen by different leprosy hospitals. In England it appears to be St. Mary Magdalene. This is due to her status as an outcast, who realized her sin and cleansed by Jesus Christ.

2001 Anthrax attacks in the US (9)

The 2001 anthrax attacks in the United States, also known as Amerithrax from its Federal Bureau of Investigation (FBI) case name, occurred over the course of several weeks beginning on Tuesday, September 18, 2001, one week after the September 11 attacks. Letters containing anthrax spores were mailed to several news media offices and two Democratic U.S. Senators, killing five people and infecting 17 others. According to the FBI, the ensuing investigation became "one of the largest and most complex in the history of law enforcement". Continuous investigations were carried out and, at the end, a bio defense expert named Bruce Edwards Ivins was suspected of providing the spores of *Bacillus anthracis*. Later, in July 2008, he committed suicide. A review report

published by the National Academy of Science cast doubts over the government investigation. For this observation, the response of the FBI was that a combination of factors led them to their conclusion.

Bacillus anthracis, the causative agent of anthrax, is a Gram positive rod. On sheep blood agar, it produces 2-5 mm, non-haemolytic colonies with wavy edges, known as "Medusa head" colonies. Who is this Medusa? According to Greek mythology, Medusa was originally a ravishingly beautiful maiden, "the jealous aspiration of many suitors," but because she made love with Poseidon in Athena's temple, the enraged Athena transformed Medusa's beautiful hair to serpents (resembles the wavy edges of *B. anthracis* colonies) and made her face so terrible to behold that the mere sight of it would turn onlookers to stone. The hero, Perseus, was sent to fetch her head by King Polydectes of Seriphus because Polydectes wanted to marry his mother. The gods were well aware of this, and Perseus received help. He received a mirrored shield from Athena, gold, winged sandals from Hermes, a sword from Hephaestus and Hades's helm of invisibility. Perseus was able to slay her while looking at the reflection from the mirrored shield he received from Athena.

On his way back with Medusa's head, in northwest Africa, Perseus flew past the Titan Atlas, who stood holding the sky, and transformed him into stone when he tried to attack him. In a similar manner, the corals of the Red Sea were said to have been formed of Medusa's blood spilled onto seaweed when Perseus laid down the petrifying head beside the shore during his short stay in Ethiopia where he saved and wed his future wife, the lovely princess Andromeda. Furthermore, the poisonous vipers of the Sahara were said to have grown from spilt drops of her blood.

Perseus then flew to Seriphos, where his mother was about to be forced into marriage with the king. King Polydectes was turned into stone by the gaze of Medusa's head. Then Perseus gave the Medusa's head to Athena, who placed it on her shield (10).

Buruli ulcer and continental drift

Buruli ulcer (also known as the Bairnsdale ulcer, Searls ulcer, or Daintree ulcer) is an infectious disease caused by *Mycobacterium ulcerans*. The disease was so named after Buruli County in Uganda (now called Nakasongola District), because of the many cases that occurred there. This infection has been reported from at least 32 countries around the world, mostly in tropical areas (11).

In Sri Lanka, skin ulcers consistent with *M. ulcerans* infection were found among Australian troops in 1942. The ulcers occurred in only one battalion of the regiment, which was stationed along the shores of Lake Koggala near Galle in the south of the country. Similarly,

M. ulcerans infection was first reported in Australia in 1948 in a paper describing 6 patients from Victoria, 5 of whom came from the Bairnsdale district in south-east Australia (12).

In December 1986, Dr. Siri Wickremesinghe came back to Sri Lanka from Melbourne, Australia, and joined the Medical Research Institute once again. By that time, we also had come to the MRI as students of the first batch of Diploma in Medical Microbiology programme of the PGIM. In a personal conversation, Dr. Wickremesinghe, referring to the reported cases of Buruli ulcer in Koggala, and Victoria, suggested the possibility that, a long, long time ago, at the beginning of the evolution of the earth, Sri Lanka and Australia were together, later they were separated due to continental drift.

What is continental drift? Continental drift is the movement of the Earth's continents relative to each other by appearing to drift across the ocean bed. The important question is that, could there be a link between Koggala in Sri Lanka and Melbourne in Australia? If it is so, could it be due to continental drift? To come to a conclusion, more research has to be done.

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