

**PROFESSOR RAGUNATHAR KANAGASUNTHERAM
(1919–2010)**

Ragunathar Kanagasuntheram, Emeritus Professor of Anatomy at the National University of Singapore, passed away peacefully on 19 June 2010 at the age of 91 years in Adelaide, Australia. A giant of his time, he assumed the post of Head, Department of Anatomy in the then University of Singapore in 1962. Professor R Kanagasuntheram received his Doctor of Philosophy (in Anatomy) at the University of Cambridge (1952). After a short stint as a lecturer at the Department of Anatomy, University of Ceylon at Colombo, Ceylon and four years at the University of Khartoum, Sudan, North Africa, he set sail for Singapore, the gateway between the East and West, where he remained rooted for the next two decades.

Prof Kana (as he was affectionately known by many generations of students) was a respected and inspirational teacher and mentor at the Department of Anatomy to thousands of medical, dental, pharmacy and science students. He also had the honour of being the first Asian to occupy the Chair of Anatomy in 1962, almost 60 years after the establishment of the local medical school when Anatomy was first taught by the pioneer Principal, Dr GD Freer, in July 1905.

From surgeon-in-training to academic

Born in Karainagar (Ceylon, now called Sri Lanka) on 14 October 1919, Prof Kana qualified with MBBS degree from the prestigious University of Ceylon at Colombo, Ceylon in 1944. He was the only surviving son of five children of Mr and Mrs P Ragunathar. His father was a village teacher who was strict and righteous, in line with tradition and yet magnanimous. Prof Kana underwent his postgraduate surgery training, completing Part 1 of the Fellowship of the Royal College of Surgeons (FRCS), but decided (for health reasons) to forgo further training for Part 2 of the FRCS examinations to devote himself to the teaching of Anatomy.

He thus embarked on a long journey to pursue his PhD at the University of Cambridge, England, from which he graduated in 1952. While pursuing his PhD degree, he studied the development of the gastrointestinal tract and published two landmark papers in the *Journal of Anatomy*. These became important references in various editions of *Gray's Anatomy*, which is widely regarded as the authoritative reference textbook on the subject in medical schools worldwide. These seminal papers, entitled "Development of the human lesser sac" and "Some observations on the development of the human duodenum" apparently changed the thinking of anatomists of his time regarding the organisation of the human gut. They also ensured his continued interest in the various aspects of development of the gastrointestinal tract. After obtaining his PhD under the tutelage of the Doyen of Anatomy in the United Kingdom, Professor James D Boyd, Prof Kana lectured in both Ceylon and Sudan for a few years, before he brought his experiences to the then University of Singapore and started basic Anatomy research by setting up the Histology Laboratory for the preparation of slides for both teaching and research. Prof Kana was a pioneer in basic Neuroscience Research at our university.

Of mice, monkeys and men

Prof Kana built an Anatomy Animal House to stock animals (*viz.* mice, rats, tree shrews [tupai], slow lorises, hylobates gibbons and macaque monkeys) for long-term research projects, with some of the best holding facilities, and initiated the employment of a full-time animal caretaker. In the late 1960s, he deployed a senior laboratory technician to oversee the daily operation of a brand new Electron Microscope Unit, which came directly under his charge. The main facility was the newly-purchased Hitachi HS-8 electron microscope, a coveted piece of research equipment that was the first such machine in Southeast Asia and which spearheaded a new horizon in morphological research in the local medical school.

Prof Kana had a profound interest in the intrinsic muscles of the hand, and until the day he left the University, he was still working on the lumbrical muscles of the hand of macaque monkeys. In fact, he was investigating the fine structure of the neuromuscular (myoneural) junctions using the advanced acetylcholine-esterase (AChE) staining technique at the light as well as electron microscopic levels. Over the years, Prof Kana published more than 70 research papers in renowned international refereed journals, on wide-ranging topics such as the nasopharynx, vomeronasal organ, spinal ganglia, duodenum and intrinsic muscles of the hand. Because of his intense research

interest in the comparative anatomy of mammals (especially sub-human primates) and his substantial contributions to anatomical sciences, Prof Kana had the distinction of being one of the few Asians ever elected as a Fellow of the Zoological Society (FZS) (United Kingdom).

Visionary leadership catalysed the establishment of Hand & Reconstructive Microsurgery Unit at the National University Hospital (NUH)

Prof Kana's visionary leadership also saw his pioneering efforts in the setting up of a fully equipped Animal Operating Theatre (located above the Dissection Hall, next to the Tan Teck Guan Building at the Sepoy Lines campus) for surgery on various animal species for research and surgical skills training. Anatomists, orthopaedic surgeons and general surgeons were using this facility to hone their surgical skills as well as using animal models for their research (in what is the equivalent of Comparative Medicine today). The legacy of the present Department of Hand & Reconstructive Microsurgery at NUH can be traced to Prof Kana's pioneering efforts in setting up facilities for surgical skills training.

Exemplary, consummate teacher

Prof Kana was an exemplary teacher. He was able to emphasise the important aspects of the topics he was covering and had the ability to explain difficult concepts regarding a specific structure, its relations and function(s) in a way that helped his students to understand and learn. Over the years, his zeal and enthusiasm for teaching medical and dental students went beyond expectation and description. He identified immediately with his students, and they all loved him for his kind and tender approach in infusing them with knowledge, some of which could not be found in standard textbooks.

Prof Kana's co-authored book, "A New Approach to the Dissection of the Human Body" was a "holy grail", the esteemed iconic guidebook that all students treasured. Everyone who had used this dissection guidebook had great affection and admiration for the authors, in particular, Prof Kana. Many doctors today still have copies of this dissection guidebook, a truly remarkable publication that identified the dissector with the body undergoing dissection and used simple language to describe the details of the structures in the human body. His other co-authored book entitled "Textbook of Anatomy: Regional, Functional, Clinical" has been successfully adopted by various medical schools worldwide.

Being the consummate educator that he was, Prof Kana strove to impart the best and most accurate knowledge to his students. As such, at 7:30 am, one could see him pacing up and down in his room, rehearsing to the last minute the contents of his lecture. He wanted to be sure that each time he taught, the lesson should be better than the one that he had delivered previously.

Many medical students fondly remember Prof Kana's teaching of Gross Anatomy and Embryology. His breadth of knowledge, boundless enthusiasm, razor-sharp mind and friendly demeanour made students hang on to his every word. His approach to teaching students never failed to create a sense of wonder in the dissection hall, where women were referred to with fatherly affection as "my dear". Cajoling students to gather around him, he would then deliver a treatise on the subject at hand in a way that would have made an actor in a Shakespearean production feel inadequate.

A wit and style all his own

At the same time, Prof Kana's humane and humble nature never failed to encourage and motivate students and colleagues alike. As a classroom lecturer and dissection hall teacher, he was peerless. His upright physique, sonorous voice, meticulous manner and formal dress (often with a tie) commanded attention and respect among his students and peers. His articulate style in showing the rotation of the gut using a rubber tubing and an Indian scarf (to demonstrate the mesentery) never failed to impress anyone (including this writer) during his embryology classes. His labelling of menstruation as "the womb weeping in disappointment" lingers in the minds of many doctors today. His other famous saying of "the sperms going down the drains" referring to the "unused spermatozoa shed through the urinary system" not only fascinated many of his former students, but also stimulated their conscience!

The professor was also a consummate and ambidextrous blackboard artist (there was no white board then) who could clearly expound on one concept after another. Because of his care, clarity and logical exposition on any structure and its relationships in the human body, he created a lasting impression of himself on many as a much loved and highly esteemed Professor by his students. His lectures remained the most vivid memories of our education, and I suspect the same view is shared by my colleagues who had the opportunity to learn from this great and wise man. Prof Kana was an extremely enthusiastic teacher and endeared himself to generations of medical students, especially during

his “special tutorials” held just prior to the professional examinations.

The pragmatist that was Prof Kana believed in change. Over the years, he kept to the overriding aim of providing a solid foundation in basic medical sciences (especially the anatomical sciences) to address the evolving needs of today’s doctors. Creating a strong Department of Anatomy after assuming the Headship was an enormous undertaking, and Prof Kana was able to achieve it all by recruiting dedicated staff members, many of whom were medically qualified to undertake the teaching of future doctors. Among the staff who served under his able leadership were Dr V Thambipillai, Dr AWS Thevathason, Professor Arthur SM Lim, Dr A Krishnamurti, Dr MM Ahmed, Dr WC Wong (who later succeeded him as the Head of Department [HOD], 1979–1992), Professor EA Ling (who was HOD 1998–2008), Dr Benny SL Cheng, Dr SK Chua, Dr SP Quek, Dr S Vij, Dr SK Loo, Dr CK Tan, Dr KH Sit, Dr P Sivanandasingham, Dr Frank CT Voon, Dr UD Lingam, and others.

Pioneer and champion of basic research

With such enthusiasm for research and a genuine concern for the progress of his academic staff members, Prof Kana pioneered basic research in the department and inducted the training of PhDs under his immediate supervision within the department, counting Drs A Krishnamurti, MM Ahmed, S Vij, SK Loo and L Krishnamurti as his PhD graduates. In 1978, Prof Kana also opened the doors of Anatomy to this writer, who had requested for PhD training in Anatomy, who subsequently obtained the qualification under the tutelage of Professors WC Wong and EA Ling, and returned to serve the Department as an academic staff member. It was a privilege to be able to follow Prof Kana’s pioneering trail, sharing some of his wise advice, encouragement, consideration and congratulatory words to students.

In the early 1960s, Prof Kana was instrumental in the investment of time and effort to preserve projected specimens. These were specially dissected by Mr Ayubi Berseh (a laboratory technician) and were encased for display as a long-term learning resource for medical and dental students. Over time, better dissected specimens and a unique collection of normal and malformed embryos were added; all specimens were fully labelled for the benefit of interested learners. This collection of specimens finally evolved into what is now the “Anatomy Museum”, an absolute haven for students to recapitulate and revise structures that they had missed in their dissections. For others, these specimens serve as a prelude to their next dissection class. Prof Kana was a visionary who could foresee the needs of future generations of students studying human anatomy.

A zest for life

As the Head of Anatomy in the 1960s, Prof Kana also never forgot to enjoy life to the fullest and had also found time to play. He always enjoyed a game of tennis with his colleagues and friends, as well as his favourite broadcasts from the British Broadcasting Corporation (BBC). As an academic, Prof Kana was housed in the university’s quarters at Eng Neo Avenue and zoomed around in a gleaming black Jaguar Mk2, followed by other driving machines along the way.

Prof Kana retired from the Headship of the Anatomy Department in 1979, when he attained the age of 60 years. He continued to serve the department upon retirement for another year before leaving for good to take up the Headship of the Anatomy Department at Jaffna Medical College, Sri Lanka. He later became the Dean of the same college.

Professor R Kanagasuntheram was conferred the Emeritus Professorship by the National University of Singapore (NUS) in 1981, the first of its kind at NUS, and he is the only anatomist to date to have been awarded this title. He was a man with character, and was steadfast in the way he loved and lived his life. He was one who believed not only in the succession of leadership but also in seeing his successor and his staff enjoy the flexibility and freedom to take the Department of Anatomy to greater heights.

Prof Kana leaves behind his beloved wife Sornam, two sons (Narendran and Rajendran – both doctors) and three daughters (Pathmini, Bhavani and Panja), as well as many grandchildren, who mourn his passing and celebrate a benevolent and munificent life that had affectionately changed or made a difference to the lives of many who had chanced upon him.

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