

# Tributes to Professor Ron Fearnhead

It is with great sadness that the HKU Faculty of Dentistry announces the passing of Professor Ron Fearnhead, Foundation Chair Professor in Oral Anatomy at the Faculty and founder of the Hong Kong Forensic Odontology Group.

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## One Scientist, Many Faculties

Professor Ronald William (Ron) Fearnhead died, aged 87, on Monday, 1 October 2007 after a long illness, and was buried in the Churchyard of the Parish Church of St Mary, Tasburgh, Norfolk, UK, on Thursday, 11 October 2007.

### *His Career*

Ron's dental career can be traced back to King's College Hospital Dental School, where he began his dental studies in 1947 and graduated with his LDS RCS Eng in November 1950. He was awarded an MDS (University of London) in 1959 for his ground-breaking thesis titled *The Neurohistology of Human Dentine*, and a DSc (University of London) in 1970 for his published research to that date. He was granted Fellowship of the London Hospital Medical College in 1988.

The posts that he held at 'The London' (as all who graduate from The London Hospital Medical College Dental School call it) were as follows:

1952-1954: Junior Lecturer in Dental Anatomy, Dental Histology, and Dental Pathology

1954-1957: Lecturer in Dental Anatomy and Dental Histology

1957-1961: Senior Lecturer in Dental Anatomy and Dental Histology

1961-1970: Reader in Dental Anatomy

1970-1980: Professor of Dental Anatomy

Ron 'retired' in June 1980, only to be re-created as the Foundation Chair in Oral Anatomy at The University of Hong Kong, at the same time that Professor CE ('Ted') Renson left The London to be Chair of Restorative Dentistry at the same university. Ron's post in Hong Kong was on a limited term contract, and when he 'retired' from Hong Kong, he was given an appointment in Dental Anatomy in the School of Dental Medicine, Tsurumi University, Yokohama, Japan, where he stayed for many years until he finally, really retired to Tasburgh, Norfolk, UK.

Ron's wide range of academic interests were reflected by his memberships of professional societies, including The Royal Society of Medicine, the Anatomical Society of Great Britain and Ireland, the Royal Microscopical Society, the International Association for Dental Research (IADR), the Society of the Study of Human Biology, the Bone and Tooth Society, and the British Academy of Forensic Sciences.

### *His Research*

Ron received international acclaim for his research. For example, he was awarded the ORCA

Rolux Prize in 1963 by the European Organisation for Research on Fluorine and Dental Caries Prevention, and the Prize for Basic Research in Biological Mineralisation by the IADR in 1974 for contributions to the knowledge of enamel structure.

Ron's scientific legacy has several parts and includes his personal original observations. He was very careful in his research to give proper credit to earlier workers, so it is proper to do the same for him.

His first major contribution concerned the demonstration of the extent of penetration of dentine tubules by nerve fibres. For this, he used the classic techniques of methylene blue staining of living *ex vivo* preparations and silver staining of fixed and sectioned material. In the latter, he was greatly helped by John Linder, a highly gifted histologist refugee from the Nazis.

Ron was an early and infectious enthusiast for electron microscopy and was jointly responsible for acquiring the funding for the first transmission electron microscope (TEM) at The London. He was also one of the very first people to use diamond knives to cut ultra-thin sections. However, he had to persuade someone to make the diamond knife, and he had to design and build the ultramicrotome machine with which to drive it. He really had to use diamond because the material in which he had a special interest, dental enamel, could not be cut with anything less.

He discovered that the simplest way to make worthwhile electron-microscopy preparations of enamel—by biological standards, an ultra-hard tissue—was to make them while the enamel was still soft in an early stage of development, when the organic matrix disperses in cold water and separated crystals can be dispersed on a grid. He also found that Bragg extinction contours across individual crystallites would migrate when the angle of incidence of the electron beam to the sample was changed. To demonstrate this, he built special tilting stages for the TEM, thereby proving that the single crystals (a) were such, (b) had extreme lengths, and (c) could, because they were so thin, accommodate much strain. This discovery radically altered our view of enamel structure and mechanics, although textbooks in this field were abysmally slow in accepting and promulgating this new knowledge.

In addition, he learnt how to fix and embed developing enamel in a resin so that it could be cut leaving the interface between soft cells and harder enamel intact. He was thus the first person to show that enamel is an extracellular secretory product.

Ron enthused about all microscopic methods that produced quantitative data. He used Barer's interference light-microscopy approach to measure dry mass in cells and helped John Waterhouse apply this in the study of salivary glands. He also acquired a point projection x-ray microscope that was made by Raymond Ely after a design by Bill Nixon (Engineering Laboratory, Cambridge) and Vernon Ellis Cosslett (Cavendish Laboratory, Cambridge). He contacted the latter about the scanning electron probe x-ray microanalyser made by Peter Duncumb of the Cavendish Laboratory, and thus began an extremely fruitful collaboration with Roy Switsur, which in turn led to contact with Gary Stewart in the Engineering Laboratory, and for the writer, a lifetime career dominated by scanning electron microscopy.

### *His Teaching*

Ron indeed started many scientific careers by pointing people in the right direction, encouraging them, and then letting them loose.

He became involved with the work of Francis Camps and Taffy Cameron, in helping with various forensic cases, which led to his becoming seriously involved in Forensic Odontology—a

field in which he again started off the careers of several individuals.

Enamel was an enduring passion, and Ron co-organised a series of meetings devoted to its study, with strong international participation. He made a great many friends via this activity, particularly Kenzo Kawasaki (from Tsurumi University, Japan), who spent a long time in London in the days of 41 Ashfield St, a fine East End slum building that Ron made the capital of Dental Anatomy teaching.

Ron's enthusiasm for research spilled over into teaching. He not only helped many members of the clinical faculty get started, but he also organised projects for undergraduate students, who most thoroughly enjoyed—and in the process learnt—how data is acquired 'at the bench'. Naturally, a few of those students were subsequently encouraged to themselves become researchers.

Characteristically, serious discussions with Ron about either research or teaching would be held over a pint in one of the many Whitechapel pubs or the staff club, to the accompaniment of Ron's roll-ups.

### *His Interests*

Among Ron's interests was painting. I was greatly surprised, when visiting Tsurumi a year ago, to be taken by Kenzo Kawasaki to the sixth floor of a tall building, not to be led to the bar, but instead to be shown one of Ron's works of art displayed on the wall, still there long after the takings were no longer dependent on his presence. Ron was also a keen fencer in his early days and an England champion before the Second World War.

Early in 1939, Ron volunteered for military service. As a medical orderly with the rank of sergeant in the Royal Army Medical Corps, he was taken prisoner in Belgium at the demise of the British Expeditionary Force and spent several years incarcerated in Poland. When he finally escaped, he walked across Poland and Ukraine to Odessa, only to be greeted with the news that he was just in time to be sent to fight in Japan, but luckily that never transpired. However, it was in the prisoner-of-war camp that Ron's career really began: he was inspired by the camp dentist and determined to become one himself.

Ron will be very fondly remembered by the many faculty members and students of all the three Dental Schools with which he was associated.

*—Professor Alan Boyde, Professorial Research Fellow, Institute of Dentistry, Queen Mary's School of Medicine and Dentistry, UK.*

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## Forensic Dental Anatomist

Professor Ronald William Fearnhead, universally referred to as Ron, joined Dental Studies (as it was then) at The University of Hong Kong in 1980. He spent the first 2 years in the Medical Faculty's Li Shu Fan building in Sassoon Road, engaged in the massive task of setting up both gross and dental anatomy, as well as histology, for dental students. This in part involved finding and hiring technicians versed in hard tissue sectioning and processing. Ron had decided that this was an essential part of the work of the Oral Anatomy Unit, which he set up in the

Prince Philip Dental Hospital on his eagerly awaited move in late 1981. In this endeavour, he was heavily influenced by his early London contacts, having become himself an extremely accomplished dental histologist. He was, for example, the first to demonstrate nerve endings in dental enamel.

Ron also maintained a variety of other interests in hard tissue biology, in particular from an evolutionary perspective—rather unusual at the time. Even when he retired (for the second time!) in 1986, he went to Japan for further study of enamel morphogenesis. HKU thus lost one of its savviest scientific heads and a man noted for his erudition, creativity, and vigour. He was also a general mentor and widely respected, giving advice to many people, especially to those embarking on their careers.

Ron, however, took nothing for granted. Having spent some time as prisoner of war—and escaping—he experienced some of the worst of life, and witnessed the privations and difficulties of his colleagues. These experiences affected him profoundly, but he did not become embittered, remaining indefatigable and ever nurturing his child-like curiosity, a hallmark of a good scientist. This background would be difficult to discern when he held court over several years in the lower bar of the Bull & Bear (the pub in Central, now sadly long gone), as he conducted the ritual of his roll-your-own cigarette making, flourishing his silver tobacco case. He lived each day for itself, encouraging others to take the same approach, making the best of it all. His good humour was an inspiration.

When Ron came to Hong Kong, he brought with him some 30 years of experience in dental forensics, experience that included the infamous Christie case in 1953, in which he made identifications from tooth fragments. In 1980, Hong Kong had very limited capacity for identification from dental records—because there were so few. Ron determined to use more fundamental structural information and developed dental photographic superimposition, which uses for comparisons images of the skull and photographs of the possible victims. Although something similar had been tried in the Ruxton case in 1936, despite an apparent success, it was not accepted by the court. Ron took the technique to a more exacting level, using specific point matching. When this was accepted in the Hong Kong High Court in the notorious 'Jars' murder case, it set a precedent for the world as the first such positive identification, a result with huge ramifications in those pre-DNA evidence days. Related to this, Ron also instigated a collection of human skulls (of known age and sex)—one of the few such reference collections in the world—which remains in the Prince Philip Dental Hospital.

The same skills were brought to bear in the 4-month work of identifying the victims of Typhoon Ellen in 1982, lost from the drilling platform Glomar Java Sea, off north Vietnam. The 81 victims, of mixed nationality and badly decomposed after several months' immersion, were all identified by him and his team, and all on a no-fee basis. He preferred to work for the institution of the Faculty rather than himself, and this resulted in the gift by the grateful Global Marine Company of the Faculty's first JEOL scanning electron microscope.

Ron has left a huge legacy. He made a positive contribution to dental curriculum development and infrastructure at HKU, some of which still persists. He was an anchor in times of trouble, and a voice of reason. He knew the value of working diligently at what inspired one: *"Never work for recognition. Do what you love to do to the best of your ability, and recognition will flow to you."*

*—Recollections by Professor Nina Jablonski, Head of Department of Anthropology, Pennsylvania State University, USA, as told to Professor Brian Darvell, Reader in Dental Materials Science, HKU Faculty of Dentistry.*