A TRIBUTE TO PROFESSOR AUTAR SINGH PAINTAL
(1925-2004)

K. RAVI AND V.K. VIJAYAN

Vallabhbhai Patel Chest Institute, University of Delhi, Delhi 110007, India

Great men are the true men in whom nature has prospered. They are not extra-ordinary – they are in the true order, what they are ought to be. They reached the summit by doing their jobs in hand with everything they had of energy, enthusiasm and hard work. More importantly, they made every man who came in contact with them feel great. Autar Singh Paintal who passed away on December 21, 2004 in Delhi was indeed such a great man who will be remembered not only for his contributions in Physiology but also for his acts of altruism.

Born on September 24, 1925 in the ruby-mining town of Mogok in Burma (now Myanmar) where his father Dr. Man Singh was a physician in the British Medical Services, after his initial schooling, Paintal was forced to move out of Burma to Lahore (presently in Pakistan) to complete his matriculation. He then did his intermediate examination of the Panjab University from Forman Christian College and subsequently obtained admission for doing MBBS at King George’s Medical College, Lucknow, India. During his stay at the Medical College (1943-1948), he won several awards and was given the coveted HEWITT Gold Medal for being the best graduate student of his batch. Thus, it appears that Paintal was born great.

There are two things to aim at in life. First, to get what you want and second, to enjoy it after that. For being what he was, even though a career in clinical medicine was available to him, he surprised many when he decided to pursue M.D in Physiology. For his thesis work, he selected the topic “Electrical resistance of the skin in normals and psychotics” which required instrumentation that would record the events fast. Realising that not much technical help was coming forth, Paintal built his own apparatus from the ex-war disposal junk and collected some valuable data from these subjects (Paintal, 1951). He introduced a new index which came to be known as “Paintal index” for evaluation of galvanic skin responses which was used by clinicians successfully to diagnose psychosis (Elliot and Singer, 1953). Even to-day, it forms the basis of the lie detector test deployed for crime detection universally. After a short stint as lecturer in the Physiology Department of King George’s Medical college, he...
K. Ravi and V.K. Vijayan

proceeded to work for his Ph.D degree with Prof. David Whitteridge in the Physiology Department of the Medical School in Edinburgh on a Rockefeller Fellowship. This gesture on the part of the Foundation was unprecedented as this Fellowship is normally given for carrying out research in the USA. From the spectrum of discoveries which he made since then, it is apt to say that Paintal got what he wanted and he enjoyed what he got, for only the wisest of mankind achieve the second.

While in UK, Paintal was assigned the task of measuring the conduction velocities of single fibres of the vagus for which the cat used to be placed in a box and steam generated from an immersion heater was passed into it so that the nerve filaments would not dry up. Paintal felt that this procedure was cumbersome since proper viewing of the fibres was not possible as steam condensed on the glass plates. To avoid this discomfort, he started dissecting the filaments under a layer of liquid paraffin (Paintal, 1953a). Even though it was a clear departure from the then convention, the usage of liquid paraffin revolutionized studies on sensory physiology. While continuing his studies on vagal afferent fibres, he successfully demonstrated that injection of chemicals into the circulation could be used as a technique to discover 'silent' sensory receptors of the viscera (Paintal, 1954).

When we are guided by the light of reason, we must let our minds be bold. Paintal was such a man of courage who was full of confidence. He had the audacity to demonstrate that the pulmonary vascular receptors which his mentor Whitteridge believed were located in the small branches of the pulmonary artery, actually ended in the right and left atria of the heart. In the process, he used ‘punctate’ stimulation as a method for localizing these receptors in an ‘open-chested’ preparation. Thus, he was not only unconventional but unorthodox also. His Professor had the strength of character to accept his pupil’s findings gracefully. More importantly, it was he who gave wide publicity for this discovery. Thus the ‘atrial volume receptors’ (Paintal, 1953b) which have a role to play in the body fluid volume regulation became conspicuous.

After obtaining his Ph.D., he returned to India to work as a Technical Officer of the Defence Laboratories in Kanpur before taking up the post of Assistant Director at V.P. Chest Institute where he made several discoveries for which he is famous globally. From 1956-58, he was invited as Visiting Professor at Albert Einstein College of Medicine, New-York, USA, University of Utah, Salt Lake City, USA and University of Gottingen, Germany. He was then offered the position of Professor of Physiology at AIIMS where he spent 6 years from 1958-64. It was during this period that he received his D.Sc., degree from the University of Edinburgh in 1960. In 1964, he returned to V.P. Chest Institute as the Director and stayed there till his retirement in 1990. During 1986-1991 he also guided the destiny of Medical Research in India as the Director General of Indian Council of Medical Research. Even after retirement and until his death, he continued his research at the Centre for Visceral Mechanisms housed at V.P. Chest Institute and investigated the sensory mechanisms which caused breathlessness and limited muscular performance especially in soldiers who were posted at high altitude.

During the years 1952—1960, he discovered several sensory receptors in the viscera. These include the ventricular pressure receptors, the gastric stretch receptors, the mucosal mechanoreceptors of the intestines (Paintal, 1973, for review) and the pressure pain receptors of muscles (Paintal, 1960). With C.C.