THE CHINESE UNIVERSITY OF HONG KONG

Professorial Inaugural Lecture

by

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on

"The Evolution of Brain Science – Views of an Anatomist"

(in English)

on

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in

Ching Kai Hall
Choh-Ming Li Basic Medical Sciences Building
on the University Campus
in Shatin, the New Territories

"The Evolution of Brain Science – Views of an Anatomist"

Synopsis of the Lecture

This inaugural lecture is divided into two parts. In the first part, I will attempt to introduce the principal scientists and scholars responsible for the major milestones in our understanding of the brain and spinal cord. These are an international group of people and included representatives from China, Europe and America. The first report of dissection actually originated in China and India. This was followed by advances made by the Greek physician, Hippocrates. Another great physician named Galen first dissected the brain and indeed discovered the Great Vein of Galen. Shortly afterwards, a Sung dynasty medical text authored by Yung San（楊介）clearly depicted the gross anatomy of the brain and spinal cord. At about the same time, both Leonardo da Vinci and Andreas Vesalius made keen and detailed observations on the brain while René Descartes, the French philosopher was convinced that the soul of body was the pineal gland. It was later that the British physician Thomas Willis made detailed study of the anatomy of the brain. The 17-19th century yielded a number of great neuroscientists in Europe and China. Notably, François Magendie, Paul Broca, John Jackson, Brown-Séquard, Gustav Fritsch and his collaborators as well as Wong Chin Yan（王清任）. Particularly worth mentioning is Professor Charcot, the Frenchman who established Saltpêtrière, the famous neurological hospital in Paris. Both he and Joseph Babinsky made significant contributions to the clinical aspects of neuroscience. In the 20th century, we have Golgi and Ramón y Cajal who began to visualize the individual neurons and their interconnections. Their work was complementary to that of Sherrington who made extensive mapping of the neural connections and contributed greatly to the understanding of the underlying physiology. Detailed assignment of the cortical area came later when the Canadian, Penfield demonstrated clearly the mapping of the motor cortex and designation of the memory region of the temporal area. Then came Sir Adrian who pioneered all the work on human EEG using the cathode ray tube discovered by Gasser and Erlanger.

This discovery lead to the recording of action potential which was later studied in great detail by Eccles and associates. Loewi and Dale then elucidated the chemical composition of the cells. In the past 50 years, work by Sperry and Levi-Montalcini resulted in the discovery of brain hemisphere functions and nerve growth factors. Hubel and Wiesel made elegant observations on the function of the monkey visual cortex while more recently Stan Prusiner discovered the prion. To this day, the anatomists' role in the advancement of neuroscience is still principally involved with identifying cells and tissues and deciphering their biochemical compositions, interconnections and functions.

The second part of the lecture will illustrate the great variety of modern techniques used to study the nervous system by anatomists. This included tracer techniques, electron microscopy, immunohistochemistry, biochemical techniques and physical techniques. This will be illustrated with examples, principally from data generated by my own group and colleagues. The examples will permit us to realize that in fact, anatomists have contributed extensively to research in the central nervous system. There is no limitation to the techniques that anatomists use but rather they have integrated various technical approaches and used them to advance science. In this aspect, anatomical research is very much alive.

Professor David T. Yew

A Biographical Sketch

David T. Yew is the Professor of Anatomy as well as the Chairman of the Department of Anatomy in the Chinese University of Hong Kong. He is a member of the biology and medicine panel of the Research Grants Council of Hong Kong and currently serves as Presidents of the Chinese Brain Research Organization and the Hong Kong Neuroscience Society.

His research interests include the neurobiology of human development and aging and the development of animal models for retinal diseases. He has published over 140 papers in international journals of USA, Britain, Sweden, Switzerland, Germany, Holland, France and Japan, contributed to 7 book chapters and authored 8 books on anatomy and neuroscience. Professor Yew is the editor for 2 journals and sits on the editorial board of 5 other journals. He also served as referee for more than ten other journals. He has been instrumental in the establishment of the journal *Neuroembryology*, which is dedicated to the development of the human brain. He has also been a visiting professor and scientist to universities and academies in Europe, the United States and mainland China.

Professor Yew received his B.Sc in Biology from New Asia College in 1969 followed by a Ph.D in Anatomy from Wayne State University in 1974. During his doctoral studies he was supervised by D.B. Meyer who was then the editor of the journal, *Acta Anatomica* and studied under other great masters of anatomy: E. Gardner, R. O'Rahilly, C.A. Fox and G. Lasker. After working as a post-doctoral research associate for the National Institute on Drug Abuse, he returned to Hong Kong to take up a lectureship in the Department of Biology at the Chinese University of Hong Kong. In 1976, he assumed a lectureship in Anatomy at The University of Hong Kong but returned to his alma mater five years later when C.U.H.K. established its own medical school. He was awarded a Doctor of Science in Medicine in 1988 and a Doctor of Medicine (habilitation) in 1995 by the University of Rostock. The Doctor of Science degree was awarded for the development of a new hypothesis on the low dose laser on biological systems. Prof. Yew was elected to the Fellowship of the Institute of Biology in Great Britain in 1995 in recognition of his contributions to retinal and neuroscience research. During the years of his career, he was fortunate to enjoy the friendship and mentorship of the following colleagues, Professor Y.W. Chan (H.K.), Professor R. Fearnhead (London), Prof. J. Gosling (Stanford), Professor P. Nieuwkoop (Netherland), Professor S. Prusiner (San Francisco), Professor G. Schumacher (Germany) and Professor R. Warwick (London). He was appointed full professor and Chairman of the Department of Anatomy at The Chinese University of Hong Kong in 1999.