A 90-YEAR HISTORY of THE CHINESE PHYSIOLOGICAL SOCIETY

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Imported Concept of Physiology in Western Medicine before the end of Qing Dynasty in 1911

Western medicine is a symptom-based approach which is different from a system-based practice in Chinese Medicine. Because of frequency visits of missionary doctors and other Western doctors, Western medicine was imported to China. After the First (1839-42) and Second (1856-60) Opium War, modern Chinese history began. the wave of learning Western's sciences and technology initiated the establishment of the School of Combined Learning (同文館) which offer various programs for foreign language learning. As language skills improved, new knowledge of medicine sciences and Western technology were introduced to Chinese. In 1871, medical schools were established in China. Based on the curriculum of Western medical education, the first public medical school (Viceroy's Hospital Medical School) was founded in Tianjin by Dr. Maehenrie from the UK in 1881. At that time, all medical sciences were taught in English. After Dr. Maehenrie passed away, it was taken over by Qing Government and renamed as Northern Medical School in 1894. Due to the Yihetuan incident (義和團事件) in 1900, the school was closed. In 1902, the school was reopened and renamed as the Medical School of the Northern Army, the former institute of the National Defense Medical College. Since Western medicine was considered as imported science, foreigner languages (such as English) were commonly used to convey the knowledge in medical schools. Since Physiology was foreign to Chinese, Western concepts of Physiology were imported to China through medical education in the late 19th century when medical schools were established. Physiology become an important subject in medical education due to its rapid growth in research due to the integration of chemical, physical, anatomical, and microscopic approaches to Physiology studies. Medical students in China started to appreciate Physiology when studying at medical schools before Qing Dynasty was overthrown.

Establishment of Chinese Physiological Society after World War I

In 1911 when the Chinese revolution led by Sun Yat-sen overthrew the Qing Dynasty, the Republic of China was established. It was about the time of World War I

(1914-1918) when the China Medical Board was established. The government decided to create a new and best medical school based on the recommendations of the Flexner Report and the model of Johns Hopkins University School of Medicine. With an endowment of the Rockefeller Foundation, the Peking Union Medical College (PUMC) was established in 1917. Modern medical education with English-medium instruction was implemented. Many of the faculties in the school, including the President of PUMC, were recruited from overseas and all updated lectures were delivered in English. In 1924, Robert Kho-Seng Lim (Robert KS Lim, 林可勝), a Physiologist, was recruited as a visiting professor at the College after receiving his PhD degree under the instruction of Edward Sharpey-Shafer in the Medical School of Edinburgh University in 1916 and working in the team of A. J. Carlson at the University of Chicago. In 1925, he was then appointed as the Head of Physiology Department.

In addition to teach Physiology, Lim established research laboratories and introduced physiological research to colleagues in PUMC. To improve scientific communication between Chinese scholars and Western physiologists, Lim organized the Beijing branch of the Society for Experimental Biology and Medicine. With the support of Hsien Wu in the Department of Biochemistry and B. E. Read in the Department of Pharmacology, Lim then launched the Chinese Physiological Society in 1926. He invited seven well-known physiologists as honorary members of the Society to further facilitate scientific exchange. The establishment of Chinese Physiological Society provides an interactive platform to build strong connections with world-class elites, including J. J. Abeland and A. J. Carlson in the USA, E. Abderhalden in Germany, J. Bacroft, F. G. Hopkins, and E.S. Schafer in the U.K., and I.P. Pavlov in Russia.

To connect Chinese Physiological Society with the world through science communication, he in 1927 became the founder of Chinese Journal of Physiology. This is the first scientific journal, published in English. Because of his unique decision in language use, the Journal quickly established itself as a leading journal for such work in Asia. Many papers that were first published in the Journal went on to be cited by various textbooks at that time, including Human Physiology (edited by Houssay in Argentina), the Handbook of Physiology (Sec. I, Vol. II), the Physiological Basis of Medical Practice (edited by Best and Taylor in Canada), Principles of Human Physiology (edited by Starling in the U.K.), and Lehrbuch der Physiologie des Menschen (edited by Landois-Rosemann in Germany).

Of Lim’s protégés , some of his students, including Der-Pei Feng (馮德培),

Chih-Teh Loo (盧致德), and Shi-Chun Wang (王世濬), later became Academicians of the Academia Sinica. In addition, Cheng-Anne Liu (柳安昌) received his PhD training in the laboratory of Walter Cannon in the U.S.A., and then became the first head of Physiology at the National Defense Medical Center in Taipei. Of the trainees in his laboratory, Chih Chin Wang (王志均) later became an Academician of the Chinese Academy of Sciences.

Physiologists not in PUMC felt the challenges of teaching Physiology with English-medium instruction. Due to the language barrier for learners, Quia Cai (蔡翹) who received his PhD from University of Chicago in 1925 decided to translate the textbook of Physiology from English to Chinese version and promote Physiology through Chinese teaching in 1927 when becoming the head of Physiology Department at Central University Medical College in Nanjing.

Due to the great influence of PUMC on medical education in China, more medical schools were transformed to an American system, including the Medical School of the Northern Army in 1933. More physiologists in medical schools joined Chinese Physiological Society. In contrast, the medical education in Taiwan followed the guideline of Japan's education system due to the Sino-Japanese Treaty of Shimonoseki, signed in 1895, that caused Japanese occupation of Taiwan for 50 years. To improve the medical care system in Taiwan, the Japanese government built Taipei Hospital and built a Japanese-based medical school (The Governor-General's School of Medicine) in 1897. During the glorious period between 1927 and 1937 in Mainland China, when physiological studies rapidly developed, medical education in Taiwan underwent systemic reform of medical education. The Governor-General's School of Medicine was converted into Taipei Medical College in 1922. To further improve the quality of higher education in Taiwan, Taihoku Imperial University (now National Taiwan University) was founded in 1928. Taipei Medical College then became the affiliated Department of Medicine in 1936. Tsungming Tu（杜聰明）was the only Taiwanese faculty member in Taipei Medical College who was promoted to the position of professor at Taihoku Imperial University. Later, he was then transferred to the pharmacology section at the university's medical department. However, all professors in Physiology are from Japan. They were actively involved in presenting their research work in the Physiological Society of Japan and published their research works in Japanese.

Transformation of the Chinese Physiological Society during World War II

In 1937, the Sino-Japanese War led to the outbreak of World War II in Mainland China. In 1939 when the war broke out in Europe, both government and medical schools in China were relocated from northern to southern regions. Foreign faculties

at PUMC either moved back to their hometown or relocated to other regions with Chinese scholars and trainees. Some medical schools were reconstructed in southern China. Some Chinese faculty at PUMC followed the footstep of Robert KS Lim to join the Red Cross Force in China. They formed the Wartime Health Personnel Training Center to support our military force. Therefore, the Society in Peking was no longer active. To sustain the academic activities of the Society with regard to its publications, Quia Cai (蔡翹) relocated from Nanjing to Sichuan in 1937. With the help of Kilbon, he created a Chengdu Branch of the Chinese Physiological Society in 1938. The Proceedings of Chinese Physiological Society were published by the Chengdu Branch of the Society between 1941 and 1945.

At the beginning of World War II, four professors from Japan worked in Physiology Department at Medical school of Taihoku Imperial University in Taiwan But, at the end of World War II in 1945, only Takenaka (竹中繁雄) (1939-1945) in Lecture One and Hosoya (細谷雄二) (1936-1949) in Lecture Two still stayed in Taiwan. in 1945, Tzung-Huan Kuo (郭宗煥) and Zhen Chang (張鎮) both worked with Professor Hosoya. The former eventually became the founder and first chairman of the physiology section at Taipei Medical University founded in 1960, while the latter became the first chairman of the physiology section at Kaohsiung Medical University in 1954. When approaching the end of World War II, Medical school of Taihoku Imperial University was attacked by vigorous bombing which ceased research activities in Physiology.

10-year Reconstruction of Physiological Studies after World War II

At the end of World War II, with the Japanese surrender in 1945, the National Defense Medical Center (NDMC) was formed by the amalgamation of the Army Medical College led by Zhang Jian (張建) and the Wartime Health Personnel Training Center and its thirteen branches in Shanghai led by Robert KS Lim. Many of the faculty members in PUMC joined NDMC. In 1947 when civil war broke out in Mainland China, NDMC was relocated from Shanghai to Taiwan under the leadership of Robert KS Lim. As Chairman of the National Military Council, Chiang Kai-shek attempted to eradicate the Chinese Communists, but ultimately failed. Nationalist government has been retreated to Taiwan in 1949 when the Nationalist government retreated to Taiwan and established the rival Republic of China, the People of Republic China was established in Beijing. Robert KS Lim moved to USA for resuming his research. With the support of the American Bureau of Medical Aid to China (ABMAC) and the China Medical Board (CMB), NDMC was reconstructed in Taiwan where Chih-Teh Loo became the dean of the NDMC. Ann-Cheng Liu,

working as a head of the physiology section, accelerated faculty development with CMB fellowships. Meanwhile, S. T. Chiang (姜壽德) as teaching assistant helped to establish a respiration-related laboratory. He later became the first head of Physiology at Yang-Ming Medical University in 1975. C.Y. Chai（蔡作雍) was a medical student when NDMC was just about to be reconstructed in Taiwan, later joined the Department of Physiology at NDMC as a teaching assistant in 1953, and finally became Academicians of the Academia Sinica in 1978.

In 1945 when Taiwan was retroceded to the Chinese government, Professor Tsungming Tu was appointed as the first dean of the Medical College after the Department of Medicine at Taihoku Imperial University was renamed as the Medical College of National Taiwan University. To fill up the vacancy, new staff was recruited, including Duo-Ching Cheu (邱德金), a member of the Taiwan New Cultural Association who was appointed as the head of Physiology with a PhD from Tokyo Imperial University, Ming-Tsung Peng (彭明聰), a protégé of Professor Tsungming Tu in Pharmacology, transferred to Physiology, and Zhen Chang. In 1947, H-S Fang who worked with Quia Cai in 1941-1943 on Aviation Physiology and became an associate professor of Physiology at National Kiangsu Medical College in 1943 was recruited by the Department of Physiology in Medical College of National Taiwan University. In the same year, the Master Program of Physiology at National Taiwan University was founded and the 228 Incident of antigovernment actions occurred, referring to February 28. The incident was followed by the era of White Terror, implementation of martial law from 1949 to 1987.

Moreover, the retreatment of the Nationalist government to Taiwan in 1949 when the martial law started, Robert KS Lim moved to USA, and Hosoya went back to Japan. Although Hosoya went back to Japan, H-S Fang continuously collaborated with Hosoya since 1947 when he worked in National Taiwan University. Due to his hard-working, he was promoted as full professor and then became the head of Physiology in 1954. To accelerate the transformation of physiology education research, he invited visiting professors from overseas to further improve the quality of both research and teaching, including Thomas Allen in 1955, F. T. Kao (高逢田) in 1956, and S. C. Wang (王世濬) in 1958.

In 1954 when Medical College of National Taiwan University was transformed to an American-like system, Professor Tsungming Tu left the institution and established a new medical college, Kaohsiung Medical School. Meanwhile, Professor Zhen Chang was recruited as the head of Physiology at National Taiwan University. In 1958, the

China Medical University (CMU) was established in Taichung to provide systemic training in Chinese Herbal medicine and pharmacy. In 1960, Taipei Medical University was founded by a group of physicians who sought to commemorate the founding of Taipei Medical College during the Japanese colonial era in the 1920s. Tzung-Huan Kuo became the first head of Physiology at a new university, Taipei Medical University in 1960.

In the first 10 years after World War II, many faculty members in Physiology were devoted in developing an infrastructure of teaching and research and cultivating new blood in Physiology. In 1959 when the National Scientific Council was established, national support offers research grant to further accelerate research activities in various fields. With financial support from the National Scientific Council and persistent efforts on both physiological education and research, H-S Fang, M-T Peng, and C.Y. Chai（蔡作雍) became Academicians of the Academia Sinica in 1978.

In 1959 when National Scientific Council was founded, Ann-Cheng Liu, the head of Physiology at NDMC, proposed a re-launch of the Chinese Physiological Society in Taiwan to meet the research and teaching needs of physiologists. To draw on the vitality of the original society, first established in 1926, the names of the Chinese Physiological Society and Chinese Journal of Physiology were adopted. The journal started publishing again in 1960, with the format and volume number indicating its continuity with the original publication.

After the relaunch of the society, the presidents of the Chinese Physiological Society have undertaken tremendous efforts to maintain the integrity of the journal. To date, the presidents have been as follows: A. C. Liu from 1959-70, H. S. Fang from 1970-73, C. Y. Chai from 1973-77, H. H. Lu (盧信祥) from 1977-81, S. T. Chiang from 1981-84, M. T. Peng from 1984-87, M. T. Lin (林茂村) from 1987-90, T. K. Young (楊志剛) from 1990-94, H. I. Chen (陳幸一) from 1994-96, P. S. Wang (王錫崗) from 1996-2000, T. H. Chiu (邱蔡賢) from 2000-02, Eminy H. Y. Lee (李小媛) from 02-04, Y. T. Lau (樓迎統) from 2004-08, Julie H. Y. Chan (華瑜) from 2008-2012, (謝博軒)　(蔡少正). In addition, the editor-in-chiefs of the Journal over the past few years have worked hard to improve the quality and promote its international standing, including A. C. Liu, C. Y. Chai, S. T. Chiang, T. H. Chiu, T. C. Fu (傅祖慶), Shirley P. H. Li (李碧雪), P. S. Wang, and Eminy H. Y. Lee.

As documented above, the visionaries who founded Chinese Physiological Society realized that physiology was an emerging field with broad applications. Recent development in new approaches, including molecular and cellular tools, has been

widely utilized in physiological studies. In addition, rapid development of bioinformatic analysis and large-scale analysis of genomes and proteomes provides new ways of exploring a new field of systems biology to our future physiologists.

Since it has been recognized that by becoming cognizant of the history and impact of critical technology and knowledge individuals will be able to make better use of such things, it is necessary to understand how the subject of physiology has evolved and how we can best determine the next step in the related studies. Therefore, it is hoped that this special issue may function as a bridge to connect physiologists in Taiwan with those in the wider world, and provide better communication in the field to enable new developments in Physiology and aid professional networking.

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