

Professor Yas Kuno (1882-1977)

The pioneer of the physiology of sweat glands and the father of thermal physiology in Japan

By Taketoshi Morimoto



Yas Kuno. The photo is from the book "Essential Problems in Climatic Physiology — A Tribute to Professor Yas Kuno in Celebration of His Seventy Seventh Birthday," edited by H. Yoshimura et al., Nankodo Publishing Company, Kyoto, 1960.

Dr. Yas Kuno, the author of "The Physiology of Human Perspiration," published by Churchill in 1934, and the extended edition "Human Perspiration" published as a monograph in American Lectures in Physiology by Thomas in 1956, was the father of thermal and environmental physiology in Japan.

Dr. Kuno was born on March 30, 1882 in Aichi prefecture. After graduating from Aichi Medical School, the forerunner of Nagoya University School of Medicine, he studied physiology at the University of Tokyo and then at Kyoto University until 1911, when he was appointed Professor of Physiology at Nanman (South Manchuria) Medical School. In 1913, he went to Leipzig to study physiology and then moved to University College London to study the physiology of circulation with Prof. Ernest Starling.

After returning to Japan, he initiated his studies on the physiology of sweating, which became his life work. He devised a new method for obtaining continuous measurements of the rate of sweating from human skin, and found that sweating can be classified into two categories, “thermal sweating” induced resulting from heat accumulation in the body, and “mental sweating” stimulated by mental stress. He also studied the development of the secretory activity of the sweat glands, nervous innervation and humoral control.

After leaving Manchuria in 1935, he returned to Kyoto University and later appointed as Professor of Physiology at Nagoya University School of Medicine, where he extended his work on sweating, covering all areas of the physiology of sweating and related problems.

After retiring from Nagoya University in 1955, he continued his studies on human sweating at Kyoto Prefectural University of Medicine. The final presentation of his life-long work was made in a special lecture titled “The Mechanism of Human Sweat Secretion” at the XXIII International Congress of Physiology in Tokyo in 1965. In that lecture, he presented a hypothesis on the evolutionary development of sweat apparatus by demonstrating how the neural control of human sweat apparatus has developed into cholinergic innervation from the adrenergic innervation of the primitive sweat glands of animals.

In addition to these research activities, as a member of the Science Council of Japan, he presented a proposal to the Japanese Government for the promotion of cooperative research activities in various fields, and the Ministry of Education therefore organized a funding system for integrated scientific research groups. The Japanese Journal of Physiology was founded by Dr. Kuno in 1951, and was edited and published by him until 1970, when its publication was handed over to the Physiological Society of Japan.

In recognition of his brilliant work, the Japanese Government awarded Dr. Kuno with the Academy Prize in 1941, followed by the highest decoration in the field of cultural achievements, the Order of Cultural Merits in 1963 and the Order of the Sacred Treasure in 1976. He was appointed as a member of the Japan Academy in 1949 and also received honorary memberships in the Physiological Society of Great Britain, the American Physiological Society and the Physiological Society of the Federal Republic of Germany.

Dr. Kuno passed away on December 30, 1977, but his contributions to the physiology of human perspiration stimulated the development of thermal and environmental physiology in Japan, in which his coworkers and his pupils, including Hisato Yoshimura, Korehiro Ogata, Shinji Itoh, Kokichi Ohara, and Teruo Nakayama, played leading roles. Furthermore, the heritage of Dr. Kuno has now descended to the second and third generations of Japanese physiologists in this field.

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