

Obituary

U. S. von Euler (1905–1983)

Ulf von Euler, who was Professor of Physiology at the Karolinska Institute from 1939 to 1972, died in March this year at the age of 78 years. After his major discovery in 1946 that consisted of the isolation and identification of noradrenaline in sympathetic ganglia and nerve fibres, he achieved an international reputation as a pioneer in catecholamine physiology.

In 1921 Otto Loewi had found adrenaline to be the transmitter in the sympathetic supply to the frog heart, but after von Euler's discovery it gradually became evident that its methylated homologue, noradrenaline, served the equivalent function in mammals and in other sympathetic systems as well. However, the frog heart, though an exception, had established a rule.

By this work von Euler acquired a germinal role in the rapidly expanding field of catecholamine physiology to which he himself continued to add leading contributions. Study of the distribution of noradrenaline in nerves and other structures, and its excretion under various conditions occupied his laboratory for several years.

Subsequent development in this field was greatly facilitated by Falck and Hillarp's 1959 fluorescence method of demonstrating noradrenaline in different tissues. P. Holtz in Germany had in 1944 opened a clinically important approach by discovering noradrenaline excretion in urine; Marthe Vogt opened another avenue in 1954 by finding sites of noradrenaline in the brain. Von Euler, in his Nobel Lecture, said that his collaboration with Hillarp gave a new direction to his research. A highly significant new discovery was that noradrenaline is stored in granules along the sympathetic nerves. These could be visualized by using the fluorescence technique.

Though young when appointed to the Chair of Physiology in Stockholm, von Euler was well prepared for the task. His years of learning had been spent in several European laboratories headed by leading physiologists of the day: Dale, de Burgh Daly, Embden, Heymans and A. V. Hill. A decisive influence was the period at Mill Hill under Sir Henry Dale where von Euler and Gaddum isolated the substance that was named prostaglandin. To Sir Henry, von Euler dedicated his monograph on noradrenaline.

Von Euler's specific interest in isolating

and testing substances from body fluids and tissues was sustained throughout his life. The work suited his gifts – with their basic elements of technical skill, great care, perseverance and industry – beyond ordinary measures. He was richly rewarded (see Bengt Pernow's contribution to this issue of *TINS*).

Von Euler's life seemed from the beginning to be destined for a scientific career. His father was the biochemist Hans von Euler, originally invited to Sweden as assistant to Professor Svante Arrhenius. Later his father became a professor at Stockholm University and co-recipient, with Arthur Hardy, of the 1929 Nobel Prize in Chemistry for work on the enzymes active in the

fermentation of sugar. His mother, Astrid Cleve, daughter of the notable chemist P. T. Cleve, was a scientist in her own right, known for her studies of fossil Diatomaceae. His godfather was Svante Arrhenius.

Speaking of the scientific atmosphere at his home and the regular opportunities for meeting scientists, von Euler stated that this 'no doubt had a great part in my growing interest in research'. To his own work his attitude was objective and he readily acknowledged the contributions to his own field of interest by forerunners and contemporaries. His matter-of-fact attitude and courteous manner contained elements of guarded prudence, producing a barrier which had to be penetrated by those who were his co-workers or just his friends. This done, the reward consisted in finding a man with an essentially benevolent humour spiced with a tinge of mild sarcasm.

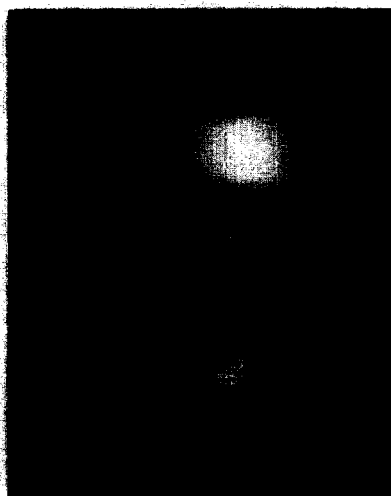
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Ulf S. von Euler's contributions to science

Ulf S. von Euler devoted his life to the study of biologically active, naturally occurring substances that were attracting a growing interest in the 1920s, when he started his scientific career. The establishment of acetylcholine as a chemical transmitter and the discovery of biogenic amines, constituting an important group in 'autopharmacology', were early milestones in the field.

Von Euler's own contributions to this



Ulf von Euler

research started in 1930, when he worked with a Rockefeller stipend at the National Institute of Medical Research in Hampstead under the guidance of its director, H. H. Dale. Von Euler devoted himself to the study of the distribution of acetylcholine in the intestinal tract. Although Dale had already shown that atropine did not block the increase in motility induced by vagal stimulation, acetylcholine was considered as the 'motility hormone'. Von Euler found, together with J. H. Gaddum, that extracts of the gut were able to stimulate isolated rabbit jejunum even in the presence of atropine. The factor responsible for this non-cholinergic contraction of smooth muscle was found to be a biologically active principle that was distinctly separate not only from acetylcholine but also from histamine and adenine nucleotides⁶. Later, von Euler suggested that the new compound, provisionally named substance P, might be a protein⁴.

Substance P became the first in a long and steadily increasing series of neuropeptides. Today it is the best characterized of this group of peptides as far as distribution, release and biological properties are concerned.

After his return to the Karolinska Institute in 1931, von Euler continued his systematic analysis of the distribution of sub-