

Hillarp's three main scientific contributions have all been of great importance for the research field to which the present Symposium was devoted. In his now classical thesis he was able to clarify the structural organization of the peripheral innervation apparatus of the autonomic nervous system. Earlier speculations of a syncytial organization were disproved, and it was shown that the innervation apparatus consists of discrete fiber systems with its terminals converging onto the effector cells. Hillarp's conclusions met with considerable resistance initially but have received strong experimental support from subsequent work by himself and others and are now generally accepted.

Hillarp started out as a morphologist, but already in his early work his interest in functional aspects is apparent. His subsequent work was largely devoted to some fundamental problems in the field of neurohumoral transmission. In 1953 he—and independently Blaschko—discovered that the adrenal medullary hormones are stored in specific intracellular particles, and a few years later he and v. Euler showed that similar “storage granules” occur in adrenergic nerves. Subsequent work by Hillarp and his co-workers showed that in the storage granules a major fraction of the adrenal medullary hormones are held in complex form together with an equivalent amount of adenosine triphosphate (ATP) and an acid protein. In more recent work they—and independently Kirshner—discovered that isolated storage granules are able to incorporate catecholamines from the surrounding medium by an ATP-Mg<sup>++</sup>-dependent mechanism which is specifically blocked by low concentrations of reserpine. Subsequent work has emphasized the functional importance of the storage granules and led to the concept that incorporation of the amines into the storage complex is essential for making them available for release by the nerve impulse.

Hillarp's third main contribution was to develop, in 1961 and 1962, a histochemical method permitting the visualization of catecholamines and 5-hydroxytryptamine in cells and nerve terminals under the fluorescence microscope. The reader of this volume will find that the discoveries emerging out of this work, carried on by Hillarp's enthusiastic pupils, represent one of the main events of this Symposium. It is true that this has not been one man's work, but to those who have had the opportunity to follow this fascinating development in all its details, it is clear that it was primarily the result of Hillarp's brilliant imagination, broad knowledge and experimental skill.

Hillarp was as great a personality as a scientist. His unusual generosity, warm-heartedness and enthusiasm made his many friends and pupils love and adore him.

ARVID CARLSSON

## ROSEMARY CASS

The death of Rosemary Cass, on May 16th last, at the age of thirty-three is a tragic loss. Her absence from meetings will be keenly felt, especially by her contemporaries who knew her as a friend and colleague.

Her undergraduate years were spent at the University of St. Andrews and in 1960 she was awarded her doctorate by that University for her thesis "Some Investigations into the Distribution and Mobilization of 5-Hydroxytryptamine." During the tenure of a Riker Fellowship at the National Institutes of Health, Bethesda, Maryland, she became interested in the study of catecholamines, and was the first worker, in collaboration with Drs. Brodie and Kuntzman, to show that guanethidine causes catecholamine depletion.

On her return to Great Britain, she was appointed lecturer in the Department of Pharmacology, School of Pharmacy, University of London. From then onwards, she carried out research into the actions of drugs which interfere with sympathetic transmission, and in particular she made a comparison of the properties of bretylium and of guanethidine. These studies were the stimulus to an investigation into the nature of the avian sympathetic transmitter, a project which had only just started when she died. Her first communication about the subject was given three or four months before her death.

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