

SYMPOSIUM ON THE AUTONOMIC NERVOUS SYSTEM

Introduction

Why a symposium on the autonomic nervous system? For the knowledgeable this should require no explanation, but the simple fact is that no anesthetic drug worth having is without striking autonomic effects. Striking as these effects are, it has only been in the last 15 years that they have become at least partially explainable. No fault of anesthesia here, for we have had to await from the basic sciences assemblage of the essential information on the pharmacology and physiology of the autonomic system. The incomparable Claude Bernard, credited with some of the first scientific observations on both the sympathetic system and anesthetics, could hardly have linked the two according to the existing knowledge of his time. Around 1889, ventricular fibrillation was observed in the cat anesthetized with chloroform, and a possible influence of carbon dioxide suggested. But A. Goodman Levy could provide an acceptable explanation for this occurrence only after the discovery and synthesis of epinephrine at the turn of the century. Thereafter, pharmacologists began to notice the similarity between some of the effects of ether anesthesia and activation of the sympathetic system, and ether was said to

deplete the adrenal medulla of epinephrine. Perhaps the first real breakthrough came with W. Brewster's observation in the early fifties that circulatory homeostasis during ether anesthesia in the dog is dependent upon the endogenous release of epinephrine.

How closely anesthesia and the autonomic nervous system are related is suggested in the pages of this symposium. Chauncey D. Leake, a long-standing friend and co-worker in anesthesia, sets the stage with a lively historical commentary. Michael H. Chase and Carmine D. Clemente peer into the relatively uncharted realm of the central nervous system for the anatomical sites of autonomic activity; we learn from Frank G. Carpenter and George B. Koelle, respectively, of events at peripheral synapses, long accessible to pharmacological manipulation and providing, perhaps, a simple model of central synaptic transmission. Current knowledge on humoral transmission mediated by the catecholamines, and methods of assay, are provided in turn by Irwin J. Kopin and Richard J. Crout. We progress then to broader actions: Dean T. Mason writes of the regulatory action on cardiovascular performance, Mason and Frederick C. Bartter on blood

volume, Allan Hemingway and William M. Price on body temperature and Richard J. Havel on intermediary carbohydrate and fat metabolism. The general pharmacologic means whereby these systems may be studied are depicted clearly by Richard J. Wurtman and Michael J. Zigmond.

A second group of essays touches upon clinical aspects. Thus, we hear from Pate D. Thomson and Kenneth L. Melmon on the assessment of autonomic insufficiency. The variegated pharmacology of vasopressor drugs, collated by Eleanor Zaimis, is followed appropriately by a critical review of hydrocarbon-catecholamine arrhythmias, prepared by Ronald L. Katz and Ralph A. Epstein. Two anesthesiologist-clinicians of note, Frederick P. Haugen and John J. Bonica, discuss pain and nerve blocks, respectively, as they relate to autonomic pathways. Last, Norman Krasnow and Howard Barbarosh bring us up to date on

beta-adrenergic blocking agents, which may well prove to be as interesting in their anesthetic implications as the adrenal steroids and reserpine have been.

To the living generation the present always seems to be a time of intellectual ferment and real progress, as this symposium surely suggests. However, in the light of history this, too, may one day be looked upon as merely a beginning. In this sense one is reminded of some comments of the past as when Ranson and Billingsley wrote in 1916, "No serious attempts have been made to locate the vasomotor centers since Dittmar in 1873." Or when Langdon-Brown in 1939 paid tribute to his teacher, "To read an account of this (autonomic nervous) system before Gaskell is like reading an account of the circulation before Harvey."

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