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NEURAL CONTROL OF THE PITUITARY GLAND

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THE SECRETORY ACTIVITY of most endocrine glands appears to be outside the direct control of the nervous system. Recent work casts doubt on any nerve supply to the adrenal cortex (274, 392, 396) though experimentally it may be stimulated by the secretion of the adrenal medulla (419). This latter undoubtedly receives a rich innervation from the sympathetic system via the splanchnic nerves and lumbar sympathetic chain (392, 444) and possibly some fibers from the vagus (395). The innervation of the gonads by (in man the tenth thoracic segment) the spinal cord through the spermatic and ovarian plexuses is well known, though the exact site of nerve fiber termination in the gonads is open to dispute (257, 258, 320). However, experimental evidence clearly indicates gonadal activity to be controlled hormonally rather than by a direct nerve supply. The thyroid gland receives nerve fibers from the cervical sympathetic system and vagus (313, 357). Nerve nets around individual follicular cells have been described (391) and their presence denied (314), but the evidence that thyroid activity is under the control of secreto-motor fibers is doubtful. Removal of or stimulation of the cervical sympathetic system (45, 148, 188, 272) may possibly affect thyroid secretion indirectly by a vasomotor influence over the thyroid (357) or pituitary (406). The vagal innervation of the parathyroids (214) appears to be inessential for normal function as demonstrated by transplantation experiments (264). Similarly the pancreas, which receives vagal and sympathetic fibers (351), can still regulate the blood sugar level after vagal section or after transplantation in a depancreatized dog (227). Regarding the nerve supply and control of the pituitary gland, see below.

Thus, of the endocrine glands only the adrenal medulla and neurohypophysis possess a rich nerve supply and are directly influenced in their activity through this supply. (It is of interest to note that developmentally, the neurohypophysis may be classified as the central nervous system and the cells of the adrenal medulla as post-ganglionic sympathetic neurones.) The more slowly acting endocrines are apparently regulated by humoral means. Some activities of the adenohypophysis are clearly influenced by the nervous system, and it may be that nervous control of the endocrine system as a whole is enacted through the mediation of this gland. This surmise would place the hypothalamico-adenohypophysial unit as a key link in the