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#### Role of cerebral dopamine in the action of psychotropic drugs

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Biochemical evidence suggests that the turnover of cerebral dopamine is increased by administration of drugs of both the phenothiazine (Anden, Roos & Werdinius, 1964; O'Keefe, Sharman & Vogt, 1970) and amphetamine (Jonas & Scheel-Kruger, 1969) groups. A high proportion of the dopamine in the central nervous system is contained in the terminal varicosities of neurones originating in groups of cell bodies in the ventral mesencephalon (Hillarp, Fuxe & Dahlstrom, 1966). Two behavioural effects of drug action have been suggested to depend upon dopamine release—the stereotyped licking, sniffing, and gnawing behaviour which follows the administration to rats of fairly large doses of the amphetamines (Randrup & Munkvad, 1967), and the turning elicited by similar doses of amphetamines in rats with unilateral nigrostriatal lesions (Anden, 1966). In both cases the behavioural effects of the amphetamine group of drugs are inhibited by administration of phenothiazine derivatives, and the tyrosine hydroxylase inhibitor  $\alpha$ -methyl-*p*-tyrosine, but not by the dopamine- $\beta$ -hydroxylase inhibitor FLA 63 (a derivative of disulfiram).

In this communication we wish to report some similarities between the behavioural actions of amphetamine-like drugs and the effects of stimulation through electrodes chronically implanted in the region of the ventral mesencephalon. In particular we have found that there is a close correspondence between the sites from which electrical self-stimulation can be obtained and the location of dopamine-containing cell bodies. Sniffing, licking and gnawing can be elicited by stimulation through the same electrodes, and are frequently accompanied by an increase in locomotor activity. From electrode sites in the lateral parts of this region contralateral turning behaviour is provoked by stimulation (Arbuthnott, Crow, Fuxe & Ungerstedt, 1970). The results of experiments with catecholamine synthesis inhibitors, and with electrodes implanted in other neural pathways through this area, support the hypothesis that all three effects of stimulation are related to activation of dopamine-containing neurones.

These results lead us to suggest that the dopamine-containing system arising from the ventral mesencephalon may function as an activating system involved in the effects of positive reward on operant behaviour. This concept of the role of dopamine in the central nervous system may be of significance for understanding some actions of neuroleptic and activation-producing drugs.

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#### Selective vasoconstrictor effect of atropine on the parametrial arteries in the pregnant guinea-pig (T)

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