

PHARMACOLOGY OF PSYCHOTOMIMETIC AND PSYCHOTHERAPEUTIC DRUGS*

RIGHT from the dawn of history in every part of the world men have sought for the means to alter, explore and control the workings of their own mind. The intimate relationship of the mind and the body, the understanding of the self, the influence of the psyche on the abnormal behaviour of the mentally deranged individuals and attainment of the tranquilizing state of mind are facets of study which are still elusive. Until recently science has shown only sporadic interest in these matters. The reawakening in this field has come from unexpected, accidental observations of the effect of certain drugs on the mind resembling psychoses of pathological conditions and from the advent of what are known as tranquilizing agents. The rapid strides made within the short period of introduction of these psychotomimetic and psychotherapeutic drugs has led to accumulation of confusing data and had led to many unsubstantiated hypotheses.

A critical review of the existing knowledge and appreciation of the inherent difficulties involved in this unexplored field of psychopharmacology was felt an urgent necessity and forms the basis of the conference, the proceedings of which have been presented in this volume.

The first two parts discuss the clinical, biochemical and neurophysiological aspects of psychotomimetic drugs. The psychotomimetic drugs are tools capable of producing brief and controllable experimental psychoses in normal persons and thus they open new channels for the investigation of certain hypothesis concerning biochemical determination of psychoses. The effect of lysergic acid diethyl amide (LSD) on the metabolism of carbohydrates and catechol amines, the unresponsiveness of the schizophrenics to LSD both psychiatrically and in terms of autonomic responses, some abnormalities of phosphorous metabolism in clinical schizophrenics and in normal persons under the influence of LSD, considerations of epinephrine derivatives as agents in clinical psychoses and the relationship of serotonin, LSD, mescaline and reserpine to the mechanisms of psychoses discussed in the various chapters contribute new fundamental concepts on the mechanism of psychoses.

The interference of cerebral activity by LSD, mescaline, N-allylnormorphine, adrenochrome

and marihuana clearly indicate the lack of relationship between EEG and the physiological effects of the drugs. The possible electrophysiological basis of the hallucinogenic effect of psychotomimetic agents and the neurophysiological basis of emotional disturbance are still fields of speculation.

The high concentration of serotonin in the brain tissue and the antagonistic action of the hallucinogenic agent LSD on serotonin has now focussed attention on the importance of serotonin in the normal activity of the nervous system. The plausible explanation for the actions of the tranquilizing agents reserpine and chlorpromazine and the hallucinogenic agents LSD and mescaline due to the interaction with the homeostatic mechanism in the brain involving the serotonin and norepinephrine and the doubts expressed on the validity of the hypothesis by a study of 5-hydroxy tryptamine antagonists have been discussed in the third part.

The influence of conditioning factors on the psychic behaviour of the different animal species and the development of operant conditioning techniques in a wide variety of experimental problems in physiological psychology stands out as the most prominent methodological advance in psychopharmacology. An analysis of drug action on visual discrimination in domestic pigeon and the conditional avoidance responses developed in rats has confirmed the use of behavioural responses in animals as laboratory tests for the discovery of new tranquilizing agents.

The difference noticed in the metabolic behaviour of mitochondria in the brain and the liver as evidenced by the fact that chlorpromazine does not interfere with the formation of ATP by the mitochondria of the brain while it does so with that of the liver and the dissociation of EEG desynchronization and behaviour arousal under the influence of some psychotherapeutic drugs are contributions of basic significance.

It is difficult to do full justice in a short review to the entire deliberations, touching on the original work by scientists of different disciplines, on a subject still considered metaphysical in nature and presented in such an exhaustive manner. Clinicians, psychologists, pharmacologists, neurophysiologists as also biochemists will be amply rewarded by a perusal of this volume.

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* From the *Annals of the New York Academy of Sciences*, 1957, 66, Art. 3, pp. 417-840., Price \$ 5.00.