THE ENDOGENOUS PSYCHOSES: A REFLECTION OF LATERALIZED DYSFUNCTION OF THE ANTERIOR LIMBIC SYSTEM

P. Flor-Henry

The audacious hypothesis of Papez, who in 1937, related emotion to the neural substrate that is now called mesial limbic, has been verified in the last forty years by increasingly abundant evidence. Subsequently the contributions made by Yakovlev, Nauta, McLean, Jones and Powell, Pribram and Livingston have provided a detailed understanding of the fine neuroanatomical structure and of the neuro­physiological organization of the mesial and basolateral components of the limbic system. In its essential structure this is constituted by the convergence of the sensory cortical systems in the orbital and superior temporal gyri projecting then into the amygdaloid, hypothalamic and brain-stem limbic core, on the one hand and into the cingulum, hippocampal-fornix, mamillo-thalamic tract, feeding back into the cingulum and the mesial-orbital frontal regions, on the other. Yakovlev and Nauta have emphasized that the orbital frontal limbic cortex is defined by the dorso-medial nucleus of the thalamus and also stressed the importance of complex cingulate-frontal, cingulate-striatal and orbital striatal connections. McLean, in 1952, proposed that the expanded Papez mesial limbic circuit be called the "limbic system", as by then the extreme importance of its basolateral component, notably the orbital frontal anterior temporal circuit was well understood. Nauta has also shown how the anterior cortical limbic structures are linked to the mesencephalic limbic core through the medial forebrain bundle which bifurcates to the septal and the amygdaloid nuclei. Nauta has further concluded that the relation of the frontal limbic zone, to the rest of the limbic system, is such that it might be viewed as the regulator of the limbic system as a whole - which it modulates. McLean, on the basis of neurophysiological studies, observed with others, that the orbital limbic region contained within its boundaries the highest representation
of autonomic activity and he also developed a functional dichotomy in the organization of the anterior limbic system: a mesial-septal system relating principally to sexuality and to "preservation of the species" and a lateral amygdaloid system relating to defence and "preservation of the individual". Impressed by the common symptomatology encountered in temporal seizures, in limbic encephalitis and in the endogenous psychoses, McLean considered that perturbation of the fronto-temporal limbic regions might be responsible for the perceptual, ideational and mood abnormalities that characterize the functional psychoses.

It is proposed, in this paper, to review the evidence which suggests that the schizophrenic syndrome, the affective psychoses and the atypical psychoses are the reflections of lateralized and asymmetrical dysfunction of the anterior limbic regions, more particularly of the orbital-frontal-anterior temporal systems.

It was Kleist who first commented on the localization and lateralization implications of the paragrammatical and paraphasic disturbances of speech found in schizophrenia, but not in the motility of affective psychoses. He concluded that these implied "sensory aphasias impairments similar to those found with focal brain lesions of the left temporal lobe". Later Chapman observed that paroxysmal dysphasia is a prominent feature of early schizophrenia, and Zangwill has discussed the paraphasias of dementia and chronic schizophrenia, rejecting the traditional neurological view that the so-called non-aphasic disorders of speech had no localizing implication. Geschwind has analyzed the neurological evidence which demonstrates that mutism, echolalia, palilalia and schizophrenic word salad result from the disconnection of the language areas in the dominant hemisphere from the rest of the cortex, notably by large frontal lesions. A large number of psychological studies reviewed elsewhere, (Flor-Henry, 1974), have documented that, in schizophrenia, there is a specific defect of verbal efficiency: impaired auditory verbal learning, impaired speech perception, inability to utilize the semantic and syntactical redundancies of language, a restriction of vocabulary. It has been shown that the "loosening of associations" (Moon et al) is in fact a subtle sensory dysphasia brought about by the "mishearing" of the stimulus words, and disappears when this is controlled. It is interesting to note, in this context, that short term memory for non-verbal stimuli in young schizophrenic adults is normal (Koh et al, 1976). The statistical investigations of the schizophrenic syndrome occurring in association with restricted cerebral lesions, of post-traumatic psychoses, of cerebral tumours, of temporal lobe epilepsy all reveal a significant association with the left temporal region. In addition it emerges from the above evidence that primary delusions, blunting of affect and catatonic symptoms are also significantly related to dominant temporal lesions (reviewed Flor-Henry, 1976).