

THE DREAM BETWEEN NEUROSCIENCE AND PSYCHOANALYSIS

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The year 2003 marked the 50th anniversary of the discovery of REM sleep. This revolutionized our concept of sleep, and opened the gate to the neurosciences, where until 1953 sleep had been rigorously excluded.

In actual fact Freud had already opened the gateway to dreams in 1895 (14), with his *Project for a Scientific Psychology*, but it was not until 1900 (15) that his *Traumdeutung* recounted his explorations there. In the 50 years since then, dreams have remained in the field of psychoanalysis which built up its concept of the unconscious and its theory of the mind around them.

Sleep, on the other hand, has always attracted more physiological than psychological interest. Starting from Pavlov's experiments in and around 1915, sleep was considered an *active* phenomenon induced by neocortical inhibition. However, in 1935, Bremer (9) suggested sleep was a *passive* event, due to sensory deafferentation. In 1972, the reticular theory took the same line, viewing sleep as the result of loss of tone in the ascending activating reticular system (24).

Electrophysiology has helped us understand sleep and its phases. Up to the 1950s sleep was believed to involve synchronous electroencephalographic activity, with high-voltage slow waves. Its phases were considered more or less deep depending on the degree of synchronization of the EEG rhythms. From falling asleep to the phase of deep sleep, the rhythms get gradually slower and more synchronous. No-one seems to have given great importance to a phase in man that paradoxically resembled waking, although it had already been described in cats (12).

In 1953, Aserinski and Kleitman (2) described this "paradoxical" phase in children, and a decade later Jouvet (18) investigated its neurophysiological features. This paradoxical sleep was electrophysiologically similar to the waking state, with EEG desynchronization, and rapid, low-voltage electrical rhythms in the cortex.

This phase of sleep also has other characteristics: there is the complete loss of postural tone, rapid eye movements – which give the phase its name, REM – pontogeniculo-occipital (PGO) monophasic waves, and neurovegetative upheavals with cardiac and respiratory arrhythmias, changes in blood pressure and the output of various hormones, especially thyroid and adrenal ones.

In 1953, Aserinski and Kleitman's findings (2) brought the study of sleep into the realm of the neurosciences. These authors' phenomenological description of REM

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