

Freudian dream theory today

IN 1953 a physiological state known as 'REM sleep' was discovered by Aserinsky and Kleitman (1953). This is a paradoxical state in which one is simultaneously highly aroused and yet fast asleep. It occurs approximately every 90 minutes throughout the sleep cycle, with monotonous regularity. In 1957 Dement and Kleitman announced that dream reports were obtained from approximately 80 per cent of awakenings from this state. By contrast, only 10 per cent of awakenings from non-REM sleep elicited equivalent reports. This was the



MARK SOLMS on dreaming in the neuropsychological age.

basis for the conclusion that REM sleep is the physiological equivalent of dreaming. The brain mechanisms of REM sleep were laid bare in a succession of experiments performed mainly by Jouvet and Hobson: REM is switched on and off

by a simple oscillatory mechanism located in a lowly part of the brainstem. This part of the brain has very little to do with mental life (its only mental function is to regulate levels of wakefulness); it couldn't perform the complex mental juggling involved in dream-work. Accordingly, by the mid-1970s, Freud's theory of dreams as complex mental creations (see box) was considered disproved.

Subsequent research revealed a more complicated state of affairs, and the simple 'REM = dreaming' equation was discarded (see Solms, in press-a, for a review). First, Foulkes and Vogel (1965) demonstrated that far more dreams occur outside of REM sleep than the early studies suggested. As many as 50 per cent of awakenings from non-REM sleep elicit dream reports, and 20 per cent of these are indistinguishable by any criterion from REM reports (by blind raters). Second, research by Antrobus and others (Antrobus, 1991; Kondo *et al.*, 1989) revealed that the occurrence of non-REM dreams is a function of level of arousal. This suggested that the bold equation 'REM = dreaming' should be replaced by a more prosaic formula: 'brain activation during sleep (regardless of sleep stage) triggers dreaming'. Third, it became clear that the brain mechanisms of dreaming do not coincide with those for REM sleep. For example, lesion studies revealed that damage to the REM-generating parts of the brainstem do not cause cessation of dreaming, whereas damage to higher forebrain structures does, in which case cessation of dreaming is not accompanied by cessation of REM (Solms, 1997, in press-a).

The theoretical emphasis in the formula 'brain activation during sleep triggers dreaming' falls on the word 'triggers'. The

SUMMARY OF THE THEORY

Freud (1900/1961) claimed that dreams were attempts to fulfil peremptory wishes, arising during sleep, derived from appetitive ('libidinal') urges. He based this claim on findings from a purely subjective method: he collected dreamers' associations to the individual elements of their dreams and then inferred implicit, underlying themes from the converging semantic and affective links. The 'latent' thoughts revealed in this way, Freud observed, were always wishful — notwithstanding the fact that manifest dreams assume a wide variety of forms, some of which (e.g. nightmares) appear anything but wishful.

The differences between the 'manifest' and the 'latent' content of dreams led Freud to infer an intervening process, by means of which the unconscious wishes could be transformed into conscious dreams. This intervening process was the so-called dream-work, which involved mechanisms such as 'displacement' (substituting representational elements for one another, e.g. your father is represented as a policeman), 'condensation' (combining multiple elements into composite hybrids, e.g. ambition, excitement and anxiety are all represented by a single image of an ascending escalator) and 'regression' (converting thoughts into perceptions, e.g. a person's importance is represented by their size).

Why did Freud think the mind functioned in this peculiar way during sleep? He offered a cascade of hypotheses. The sleeping mind is disconnected from external reality but not from its innate (instinctual) dispositions. These dispositions are unmodulated during sleep by the constraints of external reality. Goal-directed motor activity is unusual during sleep. The motivational programmes that are activated during sleep (and especially the peremptory ones, activated from instinctual sources) cannot readily be discharged in motor activity during sleep. Sleep and goal-directed action are, for the most part, mutually exclusive states. Instead of acting on one's wishes during sleep, therefore, one *imagines* oneself acting on them. This imaginary (hallucinatory) fulfilment of the wish defers the pressure to act. Hence Freud's claim that 'dreams are the guardians of sleep'.

However, the unconstrained imaginings of the sleeping mind themselves threaten to disturb sleep (i.e. they arouse anxiety). The process of dream-work is therefore tendentiously biased in favour of more acceptable representational elements and narratives. This bias is our mind's 'censorship'. To the extent that the censorship fails to disguise disturbing dream thoughts adequately, the process fails and the dreamer awakens (typically from an anxiety dream).

Freud in 1932

mechanism of dreaming cannot be reduced to simple brain activation. The activation merely triggers a process that has a complex internal organisation of its own.

Recent research (Braun *et al.*, 1997; Maquet *et al.*, 1996; Nofzinger *et al.*, 1997; Solms, 1997) has revealed that dreams require the concerted activation of a tight network of brain mechanisms responsible for instinctual behaviours, emotion, long-term memory, and for visual perception, with simultaneous deactivation of mechanisms responsible for reality monitoring and goal-directed activity. It appears that the instinctual and emotional mechanisms near the centre of the brain initiate the process, and that the 'manifest' dream is the culmination of a process of backward projection (cf. Freud's 'regression') on to the perceptual structures at the back of the brain (Solms, 1997).

These new findings are compatible with Freudian dream theory, in most respects. This is true even of Freud's central claim that dreams give expression to pre-emptory wishes.

Dreaming is obliterated completely by damage to only two brain structures. The first of these forms part of a network responsible for visuospatial perception and cognition. This is the structure that the manifest dream is 'projected' on to, and it is not surprising that it should be centrally involved in dreaming.

The second structure is more interesting:

this is the 'seeking' system of Panksepp (1999), which connects the midbrain to the limbic system and frontal lobes. This system 'instigates goal-seeking behaviours and an organism's appetitive interactions with the world' (Panksepp, 1985, p.273). It is activated by the various somatic need detectors located in the hypothalamus, as well as by some well-known recreational drugs (like cocaine), and it plays a pivotal role in states of addictive craving. No single brain system comes closer in its functional

properties than this one to the 'libido' of Freudian dream theory. It is therefore of considerable interest that among the instinctual and emotional command systems implicated in dream generation, this one seems to be pivotal (Solms, 2000). Damage to this structure results in a total cessation of dreaming (together with sharply reduced motivation). Dreams can be artificially manipulated by stimulation and inhibition of this structure, without any concomitant effect on the REM state.

In summary, it is still too soon to reach a definitive verdict on some central tenets of Freud's dream theory, but recent neuropsychological research suggests that he was at least on the right track. There is a close link between brain structures responsible for dreaming and those responsible for biological emotions and motivations. This is consistent with the idea that dreams give expression to instinctual drives. The aspect of Freudian dream theory that is most difficult (although not impossible) to reconcile with current neuropsychological knowledge is that of 'censorship' (see Hobson, 1999, for a discussion of this issue, and Solms, in press-b, for suggested research directions to resolve the question).

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