

Sleep research and psychosomatic hypotheses

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This paper examines the proposition that sleep research and its methodology provides one point of convergence for the very many different avenues of approach to the theory and practice of psychosomatic medicine. The need to find new directions for the study of the relationship between disease process and psychosocial phenomena has recently been emphasized by Crown (1975). He has recently critically examined three 'popular' psychosomatic hypotheses. Those of Engel and Schmale who describe a psycho-biological position (called the conservation-withdrawal or giving-in/giving-up syndrome) characterized by the affective state of hopelessness and helplessness which they believe importantly predisposes to certain kinds of illness, e.g. neoplasia (Engel and Schmale, 1972; Schmale and Iker, 1966). That of Sandler (1972) which is a psychoanalytic formulation which includes an aetiological role for early pre-verbal experiences and relies heavily upon unconscious mental processes, and that of Nemiah (1972) and Sifneos (1973), which emphasizes illness as arising as a maladaptive consequence to an acquired or constitutional deficit in the capacity of the individual to use and experience emotion and fantasy (alexithymia). Crown (1975) emphasizes the 'as if' quality of many of these concepts, that is to say, they have a large degree of coherent internal structures and thus apparent explanatory value but little heuristic value. He felt that the Engel/Schmale hypothesis was perhaps the most useful from a research point of view.

Others have approached the concept of psychosomatic illness from the direction of their emergence in relation to imposed life crises (Maddison and Viola, 1968; Holmes, 1961; Parkes, 1964; Morrison, Huggins and Barcha, 1968; Fraser, 1974; Bennett, 1970.) This approach has sometimes been combined with an examination of the course and outcome of the illness in relation to psychosocial assets (Berle *et al.*, 1952; Holmes *et al.*, 1961). These have stressed

the importance of certain well defined intrapsychic processes and interactions within the environment as crucial intermediaries in the resolution of these crises or their failure as evidenced by the onset of disease. Taken together they emphasize the quality and quantity of stress, the change demanded of the individual within the crisis, the degree of role transition involved and have identified in a formal manner some of the intra-psychic processes involved in adaptations and maladaptations (leading to illness) which follow upon crises.

Another approach to the psychosomatic problem is to take individual illnesses and to ignore hypotheses of a general kind aiming to examine particular aspects of the mind/body relationship; examples of work of this kind is Hirsch's work with obesity (Glucksman and Hirsch, 1968; Glucksman *et al.* 1968), Crisp's with anorexia nervosa (Crisp, 1973) and Weiner's with peptic ulcer (Weiner *et al.*, 1957). These works assume at least a degree of specificity in the degree of interaction of psychological, social and somatic events in the formation of one syndrome.

Sleep appears to us to have properties of poignant interest in all the approaches to psychosomatics, e.g. the role of slow-wave sleep in anabolic restorative processes and that of REM sleep and dreaming in maintaining systems of focused attention, a general optimistic mood, a sense of self-confidence, in processes of emotional adaptation to the physical and social environment particularly following stress or as part of an individual's life-style and personality characteristics, are now relatively well accepted as working hypotheses (Hartmann, Backeland and Zwilling, 1972; Hartmann, 1973; Breger, Hunter and Lane, 1971). Its functions could be seen to include the capacity to resist illness or to recover from it. Sleep is highly sensitive in all its aspects to alterations in the biological organism as a whole, both at a psychological and somatic level. It is now a relatively

common experience that altered states of awareness and consciousness such as relaxation, hypnosis and meditation can have a profound effect on the course of conditions generally accepted as being psychosomatic. For example, meditation and hypertension (Patel, 1975), asthma, migraine, ulcerative colitis and hypnosis and relaxation (Meares, 1961). It seems likely that the study of the phenomenology of sleep with the broad range of methodological tools available at the present time in the active and resolving phases of disease may throw light on processes of resolution and recovery. It is generally believed that sleep has amongst its functions an anabolic restorative one, perhaps particularly linked to slow-wave sleep (Hartmann, 1973; Breger *et al.*, 1971; Klein, 1967; Dewan, 1967; Shapiro, 1967; Loewinger, 1969; Oswald, 1970). In our own sleep laboratory we have facilities for examining EEG sleep, movement during sleep and for collecting blood for various metabolic studies during sleep. We have been looking at a small range of conditions which are often accepted as having psychosomatic determinants, anorexia nervosa, obesity, nocturnal scratching (here due to a variety of skin conditions referred by the dermatologists because of the evident psychosocial contributions), migraine and enuresis.

The relation of amount of sleep and the amount of REM and slow-wave sleep to disturbances of weight and nutrition have been previously discussed (Crisp and Stonehill, 1973; Stonehill and Crisp, 1973), and these studies have at least served to throw light on subtle psychosomatic relationships between mood state, appetite, and weight loss and early morning wakening.

Meanwhile, Crisp and Hafner (1974) have been able to show in an enuretic patient that there was a close correlation between the degree of motility and the degree of wetting the bed, and that imposed events such as imipramine or psychotherapy which altered the amount of bed wetting, also strongly changed the nocturnal motility. This study has allowed a hypothesis to be shown up on the relationship between movement, restlessness, and bed wetting which has an obvious bearing on the relationship between the resolution of bed wetting and the use of wired mattresses during the night, the latter presumably altering nocturnal motility.

Nocturnal scratching (Brown and Kalucy, 1975) studies have shown up particularly interesting findings in relation to psychosomatic hypothesis. These patients, like the migrainous ones, are in a highly active state of their disease. They were highly aroused during the day-time and at night had greatly reduced slow-wave sleep, scratched throughout all periods of EEG sleep, the scratching often being accompanied by a lightening of sleep or awakening. There was some reduction in total duration of REM.

It is the dreaming, however, which provides a particular point of interest for us today. Three patients were awakened a total of eight times after prolonged periods in REM during the second half of the night. The period was chosen because of the view that people in a state of conflict have longer sleep, more dreams and increased REM density, because the emotionality and primitiveness of dreams is greater during that period, and because REM periods are longer (Hartmann, 1973; Foulkes, 1966, 1962; Foulkes and Vogel, 1965; Verdone, 1968). The three patients were all to a degree alexithymic in character, and our original hope had been that access to emotional and fantasy life denied to us in psychotherapeutic encounters would be made available during dreaming. On only two occasions did patients report dreaming, these occurring in the least alexithymic of the three patients. The most 'out of touch' patient was awakened four times and denied being asleep at all on the first occasion and on the other three occasions reported no mental content whatever. The other two patients (who were awakened twice) each reported one dream. The content was in every sense wish-fulfilling, condensed latent and manifest content and had a highly primitive nature. In both cases the dreamer was completely passive, neutral and uninvolved in the emotional content of the dream; they were objective observers. Thus on six occasions no dreams were reported despite intensive questioning and on two very passive dreams. Normally under the conditions of direct questioning one would have expected a reporting rate of between 60 and 90%. The difference between recallers and non-recallers greatly converges if people are awakened directly from REM sleep rather than questioned about dreaming following a night's sleep.

In summary then, we have a condition of relatively marked diminution of slow-wave sleep and dreaming despite the presence of considerable REM.

Our migraine patients showed almost a complete absence of slow-wave sleep. Only one of them reported that he dreamt at all and this patient said that his migraine came on during the dreaming state in the latter hours of the morning. We have not yet attempted waking our migraine patients during REM because the current research purpose would not allow it but we have found a report by Dalessio (1972) on work by Dexter and Weitzman who woke patients from REM sleep with a migraine attack but no cases were reported of actual dreaming.

These combined observations might suggest that in two populations in the very active phases of their illnesses, with illnesses which have previously been thought of as having, at least in part, psychological and social determinants (and in our clinical studies

this was very evidently the case), and who clinically had features of alexithymia, there are perhaps similarities in the nature of their night's sleep, that is reduced slow-wave sleep and an absence of dreaming.

This observation is very consistent with Nemiah's (1972) construction of alexithymia, that is, that there is a block to this kind of experience in this kind of patient, perhaps even of a constitutionally determined neurophysiological kind. These studies are mentioned to show ways in which large psychosomatic hypotheses and the specific study approach to psychosomatic illness can be enriched with sleep methodology.

The absence of dreams does not of course disprove psychodynamic formulations of the genesis of psychosomatic illness. It is possible to propose that the repression and denial is of such an order that in these patients (even under the facilitating conditions of REM sleep awakening) primitive emotions do not reach consciousness either as in a nameless form or as fantasy elaboration or that if they do the patient ego investment in non-recognition is so high that even under the weakened ego observatory conditions of awakening from sleep censorship is so quickly re-established that the patient denies the occurrence of, or feelings associated with, or the content of, a dream. Federn (1953) has postulated that the function of dreaming might be a defence of the mental ego against the death-like experience of sleep, and since in these patients, for example, with nocturnal scratching their level of arousal and bodily experience is very high, dreaming may in fact become unnecessary.

There is little in these patients to relate them to the giving-in/giving-up hypothesis of Engel and Schmale (1972), and indeed the psychosomatic phenomena are not clearly those associated with illnesses traditionally seen as arising in such a context, for example, neoplasia; migraine and scratching are intermittent events perhaps more easily construed as release phenomena than manifestations of a system in a state of withdrawal. Nevertheless, it is interesting that the characteristics of sleep in severe depression are very similar to those reported for the migraine and nocturnal scratching population, that is, reduced slow-wave sleep, high arousal, and frequent awakenings and some reduction in REM. This hypothesis does lend itself to examination in a sleep laboratory. If one accepts that depressive states have a psycho-biological relationship to hopelessness and helplessness as does Engel and others, then to remain with REM there are a number of fascinating and provocative observations to be made concerning dreaming and depression. REM in severe depression is characterized by a total reduction in REM time, a shortened latency, high density, and a rebound associated with spontaneous mood shifts or following

ECT (Hartmann, 1973; Mendels and Hawkins, 1968; Kupfer and Heninger, 1972). Treatment, however, for example with tricyclics, monoamine oxidase inhibitors and perhaps ECT leads to an abolition of REM and, presumably, dreaming since mental content in non-REM is more typically that of waking life (Foulkes, 1962). It is interesting however, that many clinicians find that their patients report vivid dreams after beginning tricyclics. Thus, there is a seeming paradox of the REM findings in severe depression being interpreted as implying relative REM deprivation and yet dream absence seems to be associated with an improvement in ego experience, judgment and functioning, and in total personality integration in the healing phase with these treatments. If dreams have the kind of important function which we have outlined above, it seems that at times it is possible to imagine that they may not contribute to well-being, and one supposes that it is not impossible that their suggested relative absence in nocturnal scratching and migraine may be part of some larger recuperative form (although the converse seems more likely), that is to say that the continuing state of illness reflects the inability of the system to use dreams constructively for re-programming and coming to grips with worry, stress and depression, since these effects in normal populations are frequently associated with increased REM and longer duration of sleeping (Hartmann, 1973). It is true that increased amounts of REM can be associated with disorganization of ego function and with unpleasant emotions, for example, the increased REM following drug withdrawal and in delirium tremens.

The underlying hypothesis in this thinking is that sleep is a psycho-biological event with a probable range of functions which would intuitively be expected to interact in both the illness and the healing processes (these presumably always co-existing even in the depths of depression and depressive withdrawal reactions). It seems likely that a study of sleep and its processes on as broad a base as possible would contribute to the understanding of specific and focal psychosomatic events, and that such events might help to strengthen, eliminate or modify existing general theories. Similarly, sleep provides an avenue by which the more general hypotheses might increase their heuristic value.

Finally, the life crisis model of Holmes and others (1961) obviously lends itself to dream and REM analysis since by definition it involves a study of those processes which can lead to good or bad outcome following imposed change.

References

- BENNETT, G. (1970) Bristol floods 1968. Controlled survey of effects on health of local community disaster. *British Medical Journal*, 3, 454.

- BERLE, B.B., PINSKY, R.H., WOLF, S. & WOLFF, H.G. (1952) A clinical guide to prognosis in stress diseases. *Journal of the American Medical Association*, **149**, 1624.
- BREGER, L., HUNTER, I. & LANE, R. (1971) *The Effect of Stress on Dreams*. International Universities Press, Inc., New York.
- BROWN, D.G. & KALUCY, R.S. (1975) Correlation of neuro-physiological and personality data in sleep scratching. *Proceedings of the Royal Society of Medicine*, **68**, 530.
- CRISP, A.H. (1973) *The Nature of Primary Anorexia Nervosa*. Royal College of Physicians, Edinburgh. Publication No. 42, p. 18.
- CRISP, A.H. & HAFNER, J. (1974) Nocturnal activity and enuresis. A study of a 35-year-old male. *Journal of Neurology, Neurosurgery and Psychiatry*, **37**, 610.
- CRISP, A.H. & STONEHILL, E. (1973) Aspects of the relationship between sleep and nutrition. A study of 375 psychiatric outpatients. *British Journal of Psychiatry*, **122**, No. 569, 379.
- CROWN, S. (1975) Psychosomatics and the 'unconscious' mind—critique and evaluation. *Journal of Psychosomatic Research* (in press).
- DALESSIO, D.J. (1972) Editorial: REM sleep, depression and nocturnal migraine. *Headache*, **12**, 81.
- DEWAN, E.M. (1967) Sleep and REM as a programming process. The P hypothesis for REM. Paper read at the 7th Annual Meeting of the Association for the Psychophysiological Study of Sleep, Santa Monica, 1967.
- ENGEL, G.L. & SCHMALE, A.H. (1972) Conservation-withdrawal. A primary regulatory process for organic homeostasis. In: *Ciba Foundation Symposium on Physiology, Emotion and Psychosomatic Illness*, pp. 57–66.
- FEDERN, O.O. (1953) *Ego Psychology and the Psychoses*. Imago Publishing Co. Ltd, London.
- FOULKES, D. (1966) *The Psychology of Sleep*. Scribner, New York.
- FOULKES, D. (1962) Dream reports from different stages of sleep. *Journal of Abnormal Psychology*, **72**, 457.
- FOULKES, D. & VOGEL, G. (1965) Mental activity at sleep onset. *Journal of Abnormal Psychology*, **70**, 231.
- FRASER, M. (1974) *Children in Conflict*. Penguin, Harmondsworth.
- GLUCKSMAN, M.L. & HIRSCH, J. (1968) The response of obese patients to weight reduction: a clinical evaluation of behaviour. *Psychosomatic Medicine*, **XXX**, No. 1.
- GLUCKSMAN, M.L., HIRSCH, J., MCCULBY, R.S., BARROW, B.A. & KNITTLE, J.L. (1968) The response of obese patients to weight reduction. *Psychosomatic Medicine*, **XXX**, No. 4.
- HARTMANN, E., BACKELAND, F. & ZWILLING, G. (1972) Psychological differences between long and short sleepers. *Archives of General Psychiatry*, **26**, 463.
- HARTMANN, E. (1973) *The Functions of Sleep*. Yale University Press, New Haven & London.
- HOLMES, T.H., JOFFE, J.R., KETCHAM, J.W. & SHEEHY, T.F. (1961) Experimental study of prognosis. *Journal of Psychosomatic Research*, **5**, No. 4, 235.
- KLEIN, G.S. (1967) Peremptory ideation: Structure and force in motivated ideas. In: *Motives and Thought. Psychoanalytic Essays in Honour of David Rapaport* (Ed. by R. R. Holt) 80–130. International Universities Press, New York.
- KUPFER, D. & HENINGER, G.R. (1972) REM activity as a correlate of mood changes throughout the night. *Archives of General Psychiatry*, **27**,
- LOEUNGER, J. (1969) Theories of ego development. In: *Clinical Cognitive Psychology* (Ed. by L. Breger) p. 83. Prentice-Hall, Engelwood Cliffs, N.J.
- MADDISON, D. & VIOLA, A. (1968) The health of widows in the year following bereavement. *Journal of Psychosomatic Research*, **12**, 297.
- MEARES, A. (1961) *A System of Medical Hypnosis*, p. 295. W.B. Saunders Company Ltd, London, New York, Toronto.
- MENDELS, J. & HAWKINS, D.R. (1968) Sleep and depression. *Archives of General Psychiatry*, **19**,
- MORRISON, J.R., HUGGINS, R.W. & BARCHA, R.G. (1968) Life events and psychiatric illness. *British Journal of Psychiatry*, **114**, 423.
- NEMIAH, J.C. (1972) Emotions and physiology: an introduction. In: *Ciba Foundation Symposium on Physiology, Emotion and Psychosomatic Illness*, 15.
- OSWALD, I. (1970) Sleep the great restorer. *New Scientist*, **46**, 170.
- OSWALD, I. (1969) Human brain protein, drugs and dreams. *Nature*, London, **223**, 893.
- PARKES, C.M. (1964) Recent bereavement as a cause of mental illness. *British Journal of Psychiatry*, **110**, 198.
- PARKES, C.M., BENJAMIN, B. & FITZGERALD, R.G. (1969) Broken heart: A statistical study of increased mortality among widowers. *British Medical Journal*, **1**, 740.
- PATEL, C. (1975) Twelve month follow-up of yoga and bio-feedback in the management of hypertension. *Lancet*, **i**, 62.
- SANDLER, J. (1972) The role of effects in psychoanalytic theory. In: *Ciba Foundation Symposium on Physiology, Emotion and Psychosomatic Illness*, p. 31.
- SCHMALE, A.H. & IKER, H.P. (1966) The effect of hopelessness and the development of cancer. I. Identification of uterine cervical cancer in woman with atypical cytology. *Psychosomatic Medicine*, **28**, 714.
- SHAPIRO, A. (1967) Dreaming and the physiology of sleep. A critical review of some empirical data and a proposal for a theoretical model of sleep and dreaming. *Experimental Neurology*, (Suppl.), **4**, 56.
- SIFNEOS, P.E. (1973) The prevalence of 'alexithymic' characteristics in psychosomatic patients. *Psychotherapy and Psychosomatics*, **22**, 255.
- STONEHILL, E. & CRISP, A.H. (1973) Aspects of the relationship between sleep, weight and mood. *Psychotherapy and Psychosomatics*, **22**, 148.
- VERDONE, P. (1968) Sleep sedation: extended sleep in normal subjects. *Electroencephalography, Clinical Neurophysiology*, **24**, 417.
- WEINER, H., THALER, M., REISTER, M.F. & MINSKY, I.A. (1957) Aetiology of duodenal ulcer. *Psychosomatic Medicine*, **19**, 1.
- WIGLER, A.R. & HOLMES, T.H. (1971) Magnitude of life events and seriousness of illness. *Psychosomatic Medicine*, **133**, No. 2.
- WYLER, A.R., MASUDA, M. & HOLMES T.H. (1971) Magnitude of life events and seriousness of illness. *Psychosomatic Medicine*, **33**, No. 2, 115.