

Piergiorgio Strata, Dormire, forse sognare, Carocci, Roma 2017, pp. 206 (euro 15,00)

What mysterious mechanisms lie in brain circuitry during sleep?

To this and many other questions, *Dormire, forse sognare. Sonno e sogno nelle neuroscienze*, the last book of the neuroscientist, *emeritus* Professor Piergiorgio Strata, aims to find more than an answer. Its title, evocatively, refers to those famous verses of the *Ham-let*, where “sleeping” is declined with “dying”, and then with “dreaming”, but in a context of fear and revenge. On the contrary, the background on which Strata re-lies is far more complex. Firstly, the book is preceded by an interesting historical preface of two specialists, Chiara Cirelli and Giulio Tononi, who tied their life-long research to the study of sleep and its pathologies. Strata starts from the neurophysiological theory on the alternation between REM and non-REM sleep in the framework of the pioneering research of Giuseppe Moruzzi and Horace W. Magoun on the ascending reticular activating system. Then, he goes to examine the behavior of the thalamocortical complex during sleep and wakefulness, and in particular the role of the thalamus, which serves as true “gatekeeper” for sensory information to the cerebral cortex. After going through the activity of various molecules, neurotransmitters and neuromodulators promoting sleep (*in primis* adenosine), Strata passes to highlight the significance of sleep in terms of survival, and especially for the maintenance of physical and mental health. In recent decades the neuroscientists stress the role of the “cost containment” on the part of the brain (a notoriously wasteful organ), and Strata does not hide that “a possible solution of the REM sleep might be to accentuate energy saving “ (p. 57). To this end he puts his views in the wider context of both evolutionism and the most recent theories of the mammalian and invertebrates brain. These aspects of his book satisfy those students who already have some knowledge of the brain and its physiology, and seek further insights.

Nevertheless, even the common reader can find important points of interest. There are pages devoted to sleep change in the ageing, case studies of sleep deprivation, chapters about the restorative sleep, its disorders and remedies, pharmacological and non-pharmacological. A central place is the discussion of the *glymphatic* system: in this regard, it is worth watching a video, reported by Strata, which tells us the meaning of the “waste removal” that, during sleep, contributes to sweeping away the amyloid proteins, the presence of which is a factor matching insomnia to Alzheimer’s disease. Among history, poetry, art and science, the theme of the dream is no less attractive. Strata does not hide his reservations against Freud’s theory of the unconscious applied to the dream. Even in this respect the approach is strictly neuroscientific and it refers, on one hand, to the theory of consciousness, in particular of the “global neuronal workspace”, according to Stanislas Dehaene, whose Strata is a fervent admirer; from the another side, to the state of the *default mode network* formulated by Marcus Raichle, a theory who is becoming more and more important in the studies of the brain resting state. Significant are the electrical and magnetic transcranial stimulation techniques, which show that the dream is correlated with intrinsic functional connectivity, but in a “deformed” state both for the altered frequency of neuronal discharge and for the abnormal release of neurotransmitters and neuromodulators (p. 166). Finally, the dream has been, and will always be, an exciting object of interest in the figurative arts both as expression of unconscious activity and “mask-ing” of our most occult desires. From antiquity (more precisely, from the first graffiti, which witnessed a link between sexual activity and dream) to the early twentieth century, the dream inspired artists of the most diverse addresses. The suggestive and exotic cover of the book, from a famous painting of the post-impressionist “naive” painter Henri Rousseau, gives us confirmation. A useful, not trivial, glossary completes this volume, which leaves us with many answers, but also with some worrisome questions.

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