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hypothèses et interprétations proposées semblent reposer sur des preuves parcellaires. Par exemple, dans les sections sur les politiques microscopiques et macroscopiques de gestion des budgets, le lecteur s'attend à trouver des séries de données appuyant les propos des auteurs. Or, la mention de chiffres, de pourcentage ou de moyenne est accessoire et les rares données présentées le sont sans mention de sources. À titre indicatif, nous avons repéré huit références à des données numériques dans la section sur les budgets du CTEC-Devon et aucune d'entre elles n'est accompagnée d'un renvoi à la source d'information utilisée. Les auteurs nous demande ni plus ni moins que de leur faire confiance... aveuglément!

Finalement, bien que l'approche de niveau méso développée dans *Strategic Science in the Public Interest* soit intéressante et originale, nous doutons de ses vertus heuristiques. Elle est le résultat des études de cas, le produit de leur mise en ordre et le moyen de leur donner un sens. En d'autres termes, elle ne constitue pas une « grille d'analyse » ou un cadre conceptuel qui pourrait servir à appréhender d'autres institutions ou organisations scientifiques. Il s'agit donc d'une approche résolument inductive difficilement généralisable à d'autres cas, mêmes semblables. Néanmoins, le livre de Doern et Kinder a le mérite de jeter un éclairage nouveau sur une partie importante mais méconnue du système national d'innovation canadien, soit les laboratoires fédéraux.

MIKE ALMEIDA

***The Sleep of Others and the Transformations of Sleep Research.* By Kenton Kroker.** (Toronto: University of Toronto Press, 2007. viii + 533 p., ill., notes, bibl., index. ISBN 978-8020-3769-5 \$49.95)

Many of us have heard of REM sleep, a cyclical stage of sleep associated with dreaming and Rapid Eye Movements. The term has even penetrated popular culture through a well-known rock band of the same name. Yet despite its relative fame among psychologists and pop-music fans, not to mention the centuries of interest in sleep and dreams, the phenomenon of REM was only first discovered in 1953. Why only then? Such is the kind of question Kenton Kroker sets out to answer in his sophisticated study of the past 2500 years of sleep research. He sees this history as the progressive transformation of sleep into an object of scientific knowledge. Each successive transformation is contingent upon not only the ingenuity of scientists, but also the unique configurations of intellectual, institutional, methodological and instrumental forces that

shaped the peculiar trajectory of sleep research. Kroker's "'long view' of the unfolding of sleep as a scientific object" (p.309) examines every serious study of sleep from antiquity to the present, revealing much that had been previously overlooked, such as the importance of sleep to Ivan Pavlov's work and that of the EEG to the development of psychiatry. But it is in the development of its central theme—the transformation of a hitherto hidden, mysterious and private phenomenon into something increasingly visible, measurable and public—that sets this richly detailed work apart.

Chapter one begins with the study of sleep and dreams among the ancient Greeks and Romans, and runs quickly through the investigations of the Middle Ages, Renaissance and Enlightenment. By the end of chapter two, with seven chapters to go, the book has already reached the turn of the twentieth century. Kroker's emphasis on the recent history of sleep research is eloquently justified, however. Dreams were of diagnostic and personal importance to Galen (he sought professional advice from the Gods in his dreams) but they were not objects of study in their own right. For Augustine, dreams were about self-discovery and metaphysical questions but they were "not part of systematic objective investigation" (p.48). Indeed, until well into the nineteenth century, most students of sleep did not even consider it as belonging to the realm of experience; rather, sleep was seen as an *absence* of experience, a state in which consciousness had all but disappeared, leaving nothing for the researcher to investigate.

Sleep would become increasingly tangible, however, as it came under the gaze of new forms of investigation. Freud's work was crucial to the rise of sleep research, Kroker informs us, because it introduced the idea that dreams served a purpose, that of protecting sleep from the unconscious' need to have its urges represented. Evolutionary theory would offer another way of turning sleep into an object of knowledge in the work of the Swiss psychologist Edouard Claparède who set forth an adaptive view of sleep. We sleep, Claparède theorized, as William James had previously done for emotion, not because we are tired, but to avoid tiring the body. But the biggest boost to sleep research at the turn of the century would come from the application of a formula famously developed by Claude Bernard: induce a pathological state and infer the normal. Thus, when the French psychologist Henri Piéron began systematically observing the physiological effects of sleep deprivation in dogs, sleep finally emerged as a full-fledged object of scientific knowledge. The study of sleep came of age, Kroker observes, when researchers began investigating its opposite—sleep deprivation.

Much about sleeping and dreaming still remained hidden, however. This would change with the advent of the EEG and its use in the study of sleep by the University of Chicago researcher Nathaniel Kleitman. With the EEG, “sleep was entering the era of mechanical reproduction,” (p.229) as the private experience of sleep became visible for the first time. The next major development in sleep research came from a private sleep laboratory in a home at Tuxedo Park, New York. Here researchers made use of a giant kymographic drum, allowing them to see at a glance the recording of EEG readings for eight hours at a time. Once they began recording brain activity all through the night, it soon became clear that sleep came in stages, each with its own EEG signature. The private and invisible experience of sleep had become visible and public as never before. “At Tuxedo Park, sleep achieved objective existence for the first time.” (p.290)

Despite the all-night observations conducted at Tuxedo Park in the late 1930s, REM still escaped the attention of researchers. It would take a new intellectual climate, generated by renewed interest in finding the neurophysiological correlates of psychoanalytic theory, before researchers finally discovered REM and its association with dreams. Gradually, a research programme would develop with REM and EEG monitoring at its centre. Sleep research would undertake a steady expansion as it brought the study of narcolepsy (chapter 7), insomnia (chapter 8) and sleep apnea (chapter 9) within the purview of the sleep laboratory.

The Sleep of Others is itself a model of contingency: it could not have been written without Kroker’s enormous talent, dedication and love for his craft. It is meticulously documented (the notes, bibliography and index run over 100 pages), written with wit and verve, and replete with fascinating historical connections between sleep research and topics as far ranging as hypnosis, the Dreyfuss Affair and Pavlov’s dogs, who kept falling asleep during conditioning experiments. Kroker’s remarkable combination of historical rigour and depth will remain the reference of choice in the history of sleep research for years to come, and an exemplary contribution to the history of science.

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