

EDITORS' PREFACE

Ten years ago the scientific community in Italy and abroad bid farewell to Professor Giuseppe Moruzzi, one of the great neurophysiologists of the last half century. Giuseppe Moruzzi died on March 11, 1986 at the age of 76. Noted for his extensive research on brain stem reticular structures and sleep-waking mechanisms, he counted among his closest colleagues such great pioneers in neurophysiology as Frédéric Bremer and Lord E. D. Adrian, with whom he worked while on a fellowship from the Rockefeller Foundation during his formation years before the second mondial war. In 1948-49 he went to Chicago to work with Professor H. Magoun, where he carried out the original studies on the brain stem reticular formation. The demonstration that the ascending volleys responsible for the EEG arousal course through the core of the brain stem independently from the classic specific projection pathways led to the discovery of the ascending reticular activating system. Since 1949, the concept of ascending influences arising in the brainstem reticular formation and responsible for the maintenance of wakefulness had stimulated the research of numerous investigators in the fields of anatomy, physiology, pharmacology, neurochemistry, neurology, experimental psychology and behavioral science. In 1959, Moruzzi and his associates showed the existence in the lower brain stem of EEG-synchronization and possibly sleep-inducing structures, antagonistically oriented with respect to the ascending reticular system. In further investigations, he showed that the influence of the two ascending systems on the brain stem was not limited to the regulation of the sleep-waking cycle. The ascending control exerted by the brain stem appeared to be wider in its scope: it was also responsible for maintaining the appropriate levels of brain activation which are required for different kinds of waking behaviour.

Thanks to the discoveries indicated above, the research on sleep and wakefulness has fruitfully proceeded in the last decade, shedding light on the structural, neurochemical, and functional organization of the neural circuits involved in the regulation of the sleep-waking cycle. In spite of these efforts, however, the significance of sleep is still a matter of conjecture. Advanced explanations identify the function of sleep at birth in facilitating maturation of the brain during development and, in the adult, in the necessity of stabilizing the "memory traces" caused by the innumerable events concerning brain activity during wakefulness. But these are likely to be only some of the functions attributable to sleep.

In order to pay a tribute to the memory of Professor Moruzzi on the tenth anniversary of his death, original papers or short review articles related to different aspects of sleep physiology have been collected in a special issue of *Archives Italiennes de Biologie*, dedicated to the scientist whose experimental and theoretical work on sleep-waking mechanisms has exercised a decisive influence on the development and thinking of many neuroscientists all over the world.

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