This book presents an up-to-date assessment of studies concerning the secretion and the role of melatonin in humans and experimental animals. It includes several excellent lectures presented at the international meeting on ‘Melatonin in Humans’ in Vienna 1985. The introduction contains a concise summary of the major discoveries on the pineal gland and an overview of present trends in pineal research (R.J. Wurtman).

The first part of this book is devoted to basic sciences and includes important studies on the rhythmicity of melatonin secretion, its regulation and its influence on sexual development. J. Arendt describes an interesting study on seasonal variations of melatonin secretion in humans living in temperate and polar zones. The second chapter describes the 24-hour rhythmicity of melatonin secretion in man and experimental animals (R.J. Reiter). Three important papers in this section are about the influence of photoperiods and melatonin on reproductive functions in animals: M.H. Stetson and M. Watson-Whimyre review the effects of exogenous and endogenous melatonin as well as photoperiods on gonadal function in three different species of hamsters. In the immature male and female rat R.W. Rivest et al. analyze the present data concerning the modulation of sexual maturation by melatonin and light. The role of melatonin as a time-keeping hormone in the seasonal reproductive cycle of the ewe is described by F.J. Karsch. In the last chapter of this part M. Ebadi and P. Govitrapong discuss the innervation of the mammalian pineal gland and provide a comprehensive account of neurotransmitters affecting melatonin synthesis.

The second part of this book, ‘Melatonin, Neuroendocrine Function and Sleep’, contains three papers discussing a possible role of melatonin during pubertal development in humans: P.C. Sizonenko and M.L. Aubert review the neuroendocrine changes characteristic of sexual maturation in humans. F. Waldhauser and H. Steger describe changes in melatonin secretion with age and pubescence. In this context their observation of a decreased melatonin secretion after 7 years of age appears to be of particular interest. D. Gupta reports also a decline in melatonin secretion with pubertal development and associates nocturnal melatonin secretion with the skeletal age. In another chapter G.M. Vaughan reviews the influence of sympathetic neurological lesions and of β-adrenergic antagonists on melatonin secretion. The two last papers in this section, the first one by H.R. Lieberman and the second one by A.A. Borbely, analyze sleep regulation in man and suggest that melatonin might influence the phase of circadian rhythms of sleep and sleepiness.

The third part of this book concerns the possible role of melatonin in circadian rhythms and psychiatric diseases in man. N.E. Rosenthal et al. summarize several studies on the influence of photoperiods and melatonin in seasonal affective disorder (SAD), and they
conclude that although melatonin might have some influence concerning symptoms of SAD, it could not by itself account for the phenomena observed in SAD. The second chapter of this section analyzes the patterns of melatonin rhythms in depression (A. Frazer et al.). Their results demonstrate a reduced nocturnal melatonin secretion in major depression. D.L. Murphy et al. review the mechanisms through which antidepressant and other psychotropic drugs affect melatonin secretion. They conclude that β-receptors, neurotransmitters and serotonin availability are involved in the regulation of melatonin secretion. In their very interesting paper A.J. Lewy et al. propose three critical parameters for light to be chronobiologically active in humans: intensity, wave-length and timing. Two important contributions in this section by R.A. Wever and S.M. Armstrong et al. deal with characteristics of circadian rhythms in human functions and the synchronization of mammalian rhythms by melatonin. The last part of this book is devoted to the study of pineal pathology and pharmacology. A series of cases are presented by E.A. Neuwelt et al. to demonstrate various facets of clinical management of pineal tumors. R. Krstic reviews the present concepts of the mechanism and the significance of pineal calcification, whereas D.E. Blask and S.M. Hill summarize the present knowledge concerning a possible influence of the pineal gland on neoplastic growth. Another paper describes the effects of new and stable melatonin analogs on LH release and ovulation in the rat (J.A. Clemens and M.E. Flaugh). In the final chapter H.J. Lynch and M.-H. Deng review the influence of stress on pineal function. This book includes also free communications which were reported at the conference in Vienna, containing interesting, new and in some cases not yet confirmed findings in the field of melatonin research. The present book contributes greatly to the communication of new insights in the field of the pineal gland. At the same time it shows also that important questions still remain unanswered. This book can thus be expected to have a stimulatory action on established and new investigators interested in the pineal gland and melatonin secretion.
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