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Preface

Turan M. Itil

It is a singular tragedy that the person who suggested and inspired this volume, Prof. Dr. N. Petrilowitsch, is no longer with us. His suggestion that I edit a monograph concerning drugs and the EEG was more than welcome to me. The application of electroencephalography in the field of psychiatry has been looked at with a certain degree of skepticism, even though 40 years ago Berger demonstrated the existence of physiological correlates of some psychological phenomena and established the effects of psychoactive drugs on brain waves. Perhaps due to hopelessness as a result of the lack of a viable methodology in psychiatry, only a small group of investigators, Fink, Borenstein and Goldstein just to name a few, have not been discouraged by general skepticism and have systematically studied the effects of psychotropic drugs on the EEG.

Since the symposium concerning EEG and psychopharmacology, which was organized by Max Fink during the World Congress of Psychiatry in 1961, no major efforts have been made to gather the investigators and the studies concerning psychotropic drugs and the human EEG. While the first 10 years of researching the EEG and psychopharmacology were somewhat hampered by the seemingly contradictory results of some animal studies regarding so-called dissociation of EEG and behavior, the major breakthroughs in EEG and drug research have been the application of analytical techniques and the use of sleep activation.

In part due to a space limitation and partly in order to collect the most recent results, only investigators who are still actively working in EEG and human psychopharmacology research have been invited to contribute to this monograph which includes nine chapters. Chapter I covers the qualitative awake EEG findings. In this chapter, Dr. Borenstein and Dr. Cujo describe the effects of major tranquilizers on the problem of EEG classification of psychotropic drugs. Dr. Murphee summarizes his own findings and reviews the literature regarding the EEG effects of non classical psychotropic drugs, such as caffeine, nicotine, tobacco smoking, and alcohol. Dr. Flügel describes the effects of some circulatory drugs with psychotropic action. Chapter
II reports the findings with psychotropic drugs based on different EEG quantification methods. The implementation of digital computer period analysis in order to characterize EEG profiles and the bioavailability measures of different psychotropic drugs are demonstrated by Dr. Fink. The use of a new method, so-called quantitative pharmaco-EEG, with the application of computer analysis of the EEG in the screening of new psychotropic drugs is described by us. Power spectrum analysis in psychopharmacology is the topic of Dr. Caille and the application of the analog frequency analyzer is reported by Dr. Saito. The use of the amplitude integration method in psychotropic drug research is described by Dr. Goldstein, with specific emphasis on minor tranquilizers by Dr. Marjerrison. Chapter III includes the effects of psychotropic drugs on the sleep EEG as evaluated visually. In this chapter, Dr. Jovanovic attempts to classify psychotropic drugs based on different characteristics of the sleep process; Dr. Borenstein and Dr. Cujo describe the effects of different benzodiazepines and barbiturates on the sleep EEG. In the IVth chapter, we attempt to classify psychotropic drugs based on computer-classified sleep stages and REM activity. Dr. Hartmann outlines the effects of various classes of drugs on desynchronized sleep (d-time or REM time) in chapter V. In the VIth chapter, Dr. Monroe describes the effects of psychotropic drugs on the subcortical EEG in humans. In chapter VII, the effects of psychotropic drugs on the human evoked potential are described by Dr. Shagass and a classification of psychoactive drugs based on human evoked potentials is reported by Dr. Saletu. Chapter VIII relates to the clinical significance of EEG alterations. In this chapter, Dr. Robinson discusses the relationship between EEG and behavior, Dr. Dasberg the role of the EEG as an outcome measurement, and Dr. Helmchen the significance of abnormal EEGs induced by psychotropic drugs. The IXth and final chapter includes the statistical treatments of quantitative EEG data. While Dr. Shapiro and Dr. Glasser describe sophisticated ‘conventional’ statistical techniques to determine psychotropic drug effects on the human EEG, Dr. Mucciardi describes new, rather unorthodox, techniques in the evaluation of drug-induced EEG changes. It is to be expected that the reader will find some controversial results and/or ideas within the contributions to this monograph. However, the results of quantitative EEG and sleep investigations are rather unique and very encouraging. We believe further improvement in the recording and analyzing techniques involving human cerebral biopotentials (such as very high frequency activities) and the application of new statistical approaches (for example, nonlinear statistics) to the data would significantly contribute to
EEG and drug research. If this monograph can at least stimulate some interest among young scientists who are open to new ideas, it will have achieved its purpose.

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