Vol. 1
New Concepts of the Motor Unit, Neuromuscular Disorders,
Electromyographic Kinesiology

New Developments in
Electromyography
and Clinical Neurophysiology

Vol. 1

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New Concepts of the Motor Unit
Neuromuscular Disorders
Electromyographic Kinesiology

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Preface

This treatise presents a comprehensive and critical evaluation of the ‘state of the art’ in the fast-growing discipline of electromyography, considered in the widest sense. Electromyography uses electrophysiological methods to investigate muscles, nerves, reflexes and motor systems in intact man, either normal or diseased. Rapid progress in the last three years has led to several reconsiderations of previously accepted views and to the appearance of new concepts, criteria, methods and/or procedures. The aim of the volumes is to present in a consistent manner these new developments and to clarify pending issues by putting together the various facets of the problems which are scattered in the literature of both the basic neurosciences and clinical medicine.

The world’s foremost experts actively working in the field have been invited to write 170 chapters which review and evaluate in details the pertinent data, many of which are published here for the first time. Without trying to present exhaustive résumés of the earlier literature, the treatise emphasizes the hot areas of the discipline in an effort to rapidly disseminate the new data thereby promoting better efficiency and wider scope of electromyographic diagnostic procedures while serving as a catalyst for future interdisciplinary research.

The wealth of up-dated information thus assembled should provide suggestions and answers for virtually any question about the current topics of electromyography. The books will no doubt provide a useful reference source for those who wish to make full use of clinical neurophysiology in order to solve problems in neurology, physical medicine, revalidation, clinical pharmacology, physical education, psychiatry, orthopedic surgery, human factors studies, internal medicine and anesthesiology.

On the other hand, basic neuroscientists interested in the neurophysiology of normal man and primates will also find useful information about recent methods and results.

Rapidity of publication of a treatise with so many chapters is a necessary condition for its full impact on the further development of the discipline but this can only be achieved through considerable efforts on the part of quite a few persons. Many authors of the chapters participated actively in September 1971 in the Fourth International Congress of
Electromyography in Brussels. The present publication represents considerably more than the congress proceedings but it would certainly not have been completed so rapidly with such a wide scope without the enthusiasm and dedication catalyzed by that successful congress. I am very grateful to all my colleagues who contributed so much to this venture, and I thank particularly Prof. EDWARD H. LAMBERT (Rochester, Minn.), Prof. BENGT JONSSON (Göteborg), Prof. ROGER W. GILLIATT (London), Dr. PETER J. Dnck (Rochester, Minn.), Dr. Rorni WILLisOn (London), Prof. Sir Joni ECCLES (Buffalo), Prof. KARL-ERIK HAGBARTH (Uppsala), Prof. ROBERT R. YOUNG (Boston), Prof. MAURICE HuGON (Marseille) and Dr. PAUL DELWAIDE (Liège) for their friendly advice in the planning of the books. I am also grateful to Miss GILLIAN DUNKLEY (London) who supervised the English and acted as editorial assistant.

JoHi E. DESMEDT, MD.

Editor's Note

To provide a comprehensive coverage of fast-growing areas in electromyography and to have it published rapidly represent two aims which are rather difficult to achieve simultaneously. On the one hand, the usual proceedings of international meetings can disseminate recent results but generally lack depth and perspective: their popularity seems to be declining in the context of the current publication explosion. On the other hand, the seasoned surveys of the handbook format can be helpful to take stock of well-established data but they may become inadequate and out-of-phase by the time they are published when the discipline is moving forward rapidly. It is not easy to preserve the strong points of either formula while eliminating their respective drawbacks, but this was nevertheless attempted here. The difficulties of such an enterprise increase with the number of different contributions to be assembled and with the speed imposed for the collection of manuscripts, the editing and the publishing tasks. As far as possible, each topic has been dealt with in several chapters by different authors which provides access to recent unpublished results of several active research groups and also makes sure that the various facets of each problem are thoroughly discussed in relation to the various approaches. With careful editing this procedure can produce an updated presentation of recent data and concepts with, in fact, little undue duplication (see, for example, the sections on computer EMG analysis and on sphincter EMG in volume 2, or the section on blink reflexes and
on unloading reflexes in volume 3). The symposia of the Brussels International Congress of Electromyography (see appendix, vol. 3, p. 847) suggested for the books a

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general framework and the latter was elaborated subsequently. A number of experts who could not attend the congress were invited to write chapters. Authors were encouraged to extend the scope of their papers and quite a few agreed to write several chapters in order to discuss critically different problems they were actively studying. Quotations from the literature emphasize publications of the last 3 years up to Fall 1972. A number of chapters have been added to specifically discuss various methods and procedures. For example, volume 3 opens up with a discussion of the clinical criteria which can be recommended for the selection of the patients with motor disorders who are submitted to investigations of reflexes. The volume concludes with a report which is based on recommendations of a number of experts and which describes methods and pitfalls in the study of proprioceptive reflexes of the lower limb in man.

In volume 3, all the references have been pooled in a single list at the end in order to provide a convenient general bibliography. The procedure appeared justified since this book fulfills a unique purpose and represents the first comprehensive publication on the neurophysiology of reflexes in normal man and in patients with motor disorders.