

biochemical manifestation of melanoma in blood and urine, experimental pharmacology, and the epidemiology of melanoma, including variation in ethnic and geographical incidences.

The book is excellently produced and can be warmly recommended to all those wishing to obtain an understanding of the pigment cell.

G. A. SWAN

## Electromyography

*New Developments in Myography, Electromyography and Clinical Neurophysiology.* Edited by John E. Desmedt. Vols 1-3. Pp. xxvii+2094. (Karger: Basel, London, New York and München, 1973.) Sw. francs 600; £76.20; \$186; DM 560.

THIS work is a collection of papers originally presented at the Fourth International Congress of Electromyography in Brussels in 1971, supplemented by others written subsequently to make the coverage of the subject more complete. In a monumental work of editing, Professor Desmedt has brought together 168 papers and has achieved this quickly enough to ensure that the material is still quite fresh.

Volume 1 starts with several papers on new concepts of the motor unit. Much of this is concerned with the correlation of histochemical fibre type with physiological properties. Real advances in this field are evident now that microanatomical and physiological studies are being done together in the same laboratories. The glycogen exhaustion technique of Kugelberg and Edstrom has been decisive here in showing that the fibres of a unit are widely dispersed but all of the same type. The concept of subunits revealed by features of the normal electromyograph is now abandoned, though the idea finds new application in the abnormal type grouping occurring after partial denervation. As this new understanding of the motor unit develops, caution is needed in the rigid classification of unit types. The objective basis for specifying them is not yet well defined in quantitative terms and one wonders how general the scheme evolved by Burke of three distinct types will prove to be. The difficult problem of order of recruitment of different units in voluntary contractions has been tackled by Warmolts and Engel by open muscle biopsy combined with electromyography. It appears that the large, fast, ATPase-rich units can only be activated by brief strong efforts, though it is questionable whether this means that such units are not accessible to really strong maintained contraction.

As there is no general discussion of papers recorded from the congress it is a pity that the editor has not provided some comment on apparently conflict-

ing accounts. Many readers would have appreciated some enlightenment on the confused fibre type nomenclature. Did the apparent assumption by McComas and his colleagues of unit size and type homogeneity in their human muscle studies go unchallenged? Did Engel and Warmolts, who have otherwise made such valuable contributions, escape unscathed after their presentation of their ideas on diseases affecting the motor unit "in portio or in toto"?

Two papers by Stalberg and Ekstedt are of outstanding interest in giving data obtained with the single muscle fibre technique. It is now possible to understand the microphysiology of the normal unit much better and, in disease, to decide whether fibres in a unit are inactive due to defects in the fibre itself, the neuromuscular junction or in the terminal nerve branches. This technique is sure to become more widely applied and is already giving new information on muscle conduction velocity and on the F response (volume 3).

In recent years, a number of methods, which at first sight seem only suited to animal experiments, have been applied to human material. The advances which can result are well shown in the article by Elmqvist on transmission defects studied in human intercostal muscle biopsy specimens. The application of such results is obvious in the succeeding long and scholarly paper by Desmedt on myasthenia. The first volume continues with some not very illuminating articles on kinesiology but ends on a happier note with useful exploration of ways of analysis of electromyograph data and changes in fatigue.

Volume 2 starts with a collection of papers on nerve conduction, studied both with the now conventional techniques and using the highly refined averaging methods of Rosenfalk and Buchtal and the application of cerebral evoked potentials by Desmedt and his colleagues. The micro-neurographic technique makes a contribution in two papers on single unit studies of human skin receptors, while for single motor fibres, Bergman describes his ingenious finely graded stimulation method. There follows a series of clinically orientated papers on the application of conduction velocity studies, showing how useful even such an apparently simple objective measurement can become in clinical neurology, when it is properly made and understood. I feel that the papers on EMG studies of sphincters seem to make the converse point.

The final section devoted to automatic EMG analysis with computers is disappointingly small. There are a few papers from the other volumes which could have been included here and some other contributions might have been

solicited to make the section more representative of what seems likely to become an important field.

Volume 3 contains a succession of papers by workers of great prestige in the field of muscle control. There is an ordered sequence from neuroanatomy of the motor system through studies of animal and human muscle spindles to recent work on pyramidal and extra-pyramidal systems, and a valuable review of the servo theory, relating to respiratory muscles. The first four chapters on tone, spasticity and rigidity show how great is the gap between modern neurophysiology and the clinical scene, but the clinician studying the subsequent articles must be impressed by the efforts being made to close it. This is nowhere better illustrated than in the article by Vallbo on normal human muscle spindle action followed by one on the application of the same elegant technique to studies of spindle activity in Parkinsonian patients. Much of the remainder of this volume is devoted to a series of papers on reflexes studied in man. These will be valuable to any clinical neurophysiologist interested in quantitative recording of reflexes, especially because of the generally careful discussion of method and interpretation of electrical responses.

In all, the three-volume work, ponderous and expensive though it is, represents a notable contribution and many neurophysiologists will be grateful to Professor Desmedt for his labours.

A. TAYLOR

## Eight-legged Beasts

*Pycnogonids.* By P. E. King. Pp. 144. (Hutchinson: London, August 1973.) £3.50.

A MAJOR fascination in the study of invertebrate zoology resides in the small groups. Each represents an experiment in the disposition and functional interplay of the essential organ systems and each has been successful—up to a point. It may have had its period of success only to be superseded and yet to linger on like the brachiopods. Or, like the chaetognaths, it has been successful but in too narrow a sphere to permit further evolution.

The pycnogonids provide an admirable instance of another such group. One was taught about a section of the arthropods having eight legs—but certainly not arachnids—entirely marine and with bodies so narrow that the digestive organs penetrate the legs and where the males take over responsibility for guarding the developing eggs. On early marine courses one later encountered the little *Pycnogonum littorale* often addressed to the surface of sea anemones on which it fed, or else the excessively thin-bodied and spider-like species of *Nymphon*.