Overview

Muscle spindles respond to stretch of muscle with a frequency-coded afferent discharge which contains information regarding length and velocity. However, despite some thirty years of research in what might be regarded as the present era, no completely satisfactory generalised quantitative description is yet available of the transducing properties of the primary and secondary endings. The desire to have a mathematical expression of 'transfer function' to describe spindle response was largely founded on the needs of models of feedback control inspired by the engineering approach originating in the 1950s. We may now reflect that these concepts were too restrictive and for long persuaded us to try to ignore the peculiar and non-linear properties of spindles or to restrict our observations to minute length changes in which an assumption of linearity was justified. We are now painfully aware of the deficiencies of this approach and are casting around for new ways of describing spindle transducing properties which incorporate non-linear length and velocity effects without the implication that they are regrettable defects. This session is notable for the clear description of one new approach to this problem, followed, however, by an exposure of its weakness.

The effects of fusimotor stimulation are complex and not yet fully worked out, even at the simple descriptive level, but the papers presented in this area certainly advance the subject significantly. At last the details and functional significance of the various intrafusal muscle fibres and their innervation are becoming clear, and the agreement reached here was most encouraging. Readers will however still be left wondering whether we have yet found the right way of looking at fusimotor effects on spindle responsiveness and whether the terms 'dynamic' and 'static' have been adequately defined in view of their constant use in describing data.

The papers in this section were all read at the symposium.

A. Taylor et al. (eds.), *Muscle Receptors and Movement*