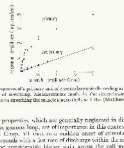
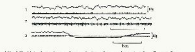
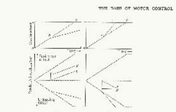
CHAPTER XII

Concluding Remarks

The preceding chapters have served to prepare an answer to questions of biological significance such as: how do we employ our muscle spindles in the control of movement and posture, and why do we need this potent and highly differentiated fusimotor-spindle apparatus? These questions should be seen against the background of general sensory physiology. In vision, for instance, it is possible to cross the borderland of enquiry from "how" to "why" by considering the significance of any well-defined physiological mechanism for the act of seeing whose ultimate purpose is to make it possible for the living organism to discriminate one thing from another. In the present context it is equally sensible to ask: what are the tasks of the muscle spindles, or of the tendon organs?

A reply stating that the muscle spindles measure muscle length and the tendon organs muscle tension means that something has been understood, albeit at a very elementary level. This reply neglects the essential aspect of control by fusimotor fibres and of such aspects the coordinated muscular act is the final interpreter, just as in vision the act of seeing is the definitive interpreter of the experimental findings in that field.

Tone. The Stretch Reflex

An early attempt at interpretation was Rossi's (1927) notion that postural tone might be maintained by contractions of the intrafusal fibres causing stretch reflexes (cf. also the stabilization theory of Hultkrantz, 1931). Rossi's idea had been forgotten, probably because it lacked experimental support. It turned up spontaneously twenty-five years later (Granit & Kaada, 1952), this time, however, as a deduction from experimental work and formulated in the following manner: "when more experience has been accumulated, the notion of tonus as a postural reflex may well have to make room for a new concept in which the postural reflex is merely the last link in a system determining spindle activity" (p. 156). This system has since been studied extensively and