refers essentially to undocumented evidence in declaring as incorrect the assumption that the phasic tendon tap is a selective and adequate stimulus to the primary endings of the muscle spindle. He probably speaks from personal experience in recording from single afferent fibres in human nerves. The precise time relationships of impulses in various muscle afferents responding to a tap are not available in spite of more than a decade of intranerve recordings from human subjects. For example, it is not enough to say that all types of receptors respond to a tendon tap. We need to know if all of them respond within the 20 ms period after the percussion in which the afferent activity was averaged. The published data of intranerve recordings of human muscle afferents to date are observations made on a much slower time scale, so that it is difficult to determine if all the muscle receptors (pacinian corpuscles, tendon organs, etc.) have the same dynamic sensitivity as the primary endings of the spindle to the brief and *light* tendon tap. Until such details are available we have to base our assumptions on results of animal experiments. As Dr Burke himself states the tendon percussion "excites primary endings better." It should also be noted that nowhere in our papers has it been stated that the afferent response was only due to spindle primary afferents. We took care to specify that primary spindle endings would be the major contributors.

5. In our study, we ensured that no movement of the hand occurred during the tests. Any "small changes in length" of muscle that can "only be detected by an accurate strain gauge" will not have produced the type of changes in averaged afferent waveform (produced by reinforcement of eye closure) which we have described. We have also considered the following documented features of human muscle spindles (Vallbo, 1974a, b).

   i. The muscle spindle afferents discharge normally at a low frequency (less than 50 imp/s) and display a poor position sensitivity in relaxed muscles.

   ii. Human spindle endings possess high dynamic sensitivity in relaxed muscles, responding impressively to minute mechanical disturbances.

6, 7. The arguments on the contribution of fusimotor efferents to the reinforcement of tendon reflexes reflect the continuing controversy on this subject. Our own analysis of the differences in fusimotor effects obtained in various laboratories has given us the impression that different levels of fusimotor effects may be obtained during reinforcement manoeuvres depending upon the posture of the subject during the manoeuvre, the strength of the manoeuvres, and the strength of tendon percussion itself. It is, then, possible that the relative central effects on alpha and gamma motoneurones are variable, with gamma effects being prominent at times. It seems the timing of the reflex response (in relation to the onset of the excitability changes produced in a reinforcement manoeuvre) is also an important consideration (Kawamura and Watanabe, 1975). In addition, it should be stressed here that the fusimotor effects observed by us are more in reducing the latency of afferent waveform than in increasing its size. As to the latency and duration of the afferent waveform, these correlate very well with intranerve multiunit recordings (Fig. 6 in Hagbarth and Vallbo, 1968; Fig. 6 in Hagbarth *et al.*, 1975). The longstanding controversy of the relative amounts of alpha and gamma effects in reinforcement manoeuvres can only be resolved by obtaining sufficient data with both single unit and multiunit recording techniques.

The differences in the size of the afferent response between Fig. 4b and 4e on page 223 is explained simply by the fact that the response in Fig. 4e was obtained after the test muscle itself had been infiltrated by xylocaine. Obviously the experimental conditions between the two cases cannot be identical since Fig. 4b was recorded when the subject was relaxed and Fig. 4e when the subject was performing a reinforcement manoeuvre.

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Notice

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