

ABSTRACTS

FOURTH QUARTER, 1971

Arch. neurol., **25**, 4, October, 1971:

BURKE, D., ANDREWS, C., and ASHBY, P.: Autogenic effects of static muscle stretch in spastic man.

Summary: Autogenic inhibition of the H reflex was produced by static stretch of the gastrocnemius-soleus complex in 9 patients with complete spinal cord lesions. Since the response of the Golgi tendon organs to passive length changes within physiological limits is considered negligible the authors concluded that this inhibition was due to activation of the secondary spindle endings. In contrast, they found that the H reflex in the pretibial group was facilitated by passive stretch. By regarding the pretibial group as flexors and the triceps surae as extensors they concluded that these effects were consistent with activation of secondary spindle endings known to produce autogenic inhibition of extensor reflexes and autogenic facilitation of flexor reflexes in spinal preparations.

J. Applied Physiol., **31**, 4, October, 1971:

WANG, C. S., and JOSEPHANS, W. T.: Contributions of diaphragmatic/abdominal displacement to ventilation in supine man.

Summary: In a study of 140 normal subjects the authors found that diaphragmatic shortening contributed on average 60% of the tidal volume in the supine position. They found that this value was higher in men than in women, and also increased with increasing age. Athletic people and people involved in occupations requiring a bellows function of the lungs (e.g. singers, wind-instrument players, glassblowers) also showed greater than normal use of diaphragmatic (abdominal) breathing. Two types of abdominal breathing were also found, one involving mainly the upper abdomen in the younger and fitter abdominal-breathers, and one involving bulging of the entire abdominal wall in older people, in obesity and during pregnancy.

J. Neurol. Neurosurg. Psychiat., **34**, 5, October, 1971:

DE RENZI, E., FAGLIONI, P., and SCOTTI, G.: Judgment of spatial orientation in patients with focal brain damage.

Summary: The authors tested 30 control and 121 brain-damaged patients with a very simple test of basic spatial perception. The brain-damaged patients were divided into 4 groups according to whether the lesion was in the right or left hemisphere and to whether or not a visual field defect was present. The test was performed both with the eyes open and with the eyes closed. They found that the group with the right hemisphere disease and a visual field defect performed consistently and significantly worse than all other groups, and concluded that the posterior portion of the non-dominant hemisphere is responsible for the very basic forms of spatial perception. On this test there was no significant difference in performance between the controls and the other 3 brain-damaged groups.

Ibid:

HIGGINS, D. C., HAIDRI, N. H., and WILBOURN, A. J.: Muscle silent period in Parkinson's disease.

Summary: Eleven patients with moderate to severe rigidity due to Parkinson's disease were studied. They were initially tested after withdrawal of all medication and the duration of the silent period was found to be within normal limits. Five patients were retested after several months of oral L-dopa therapy had produced marked reduction of rigidity. Again the silent period was within normal limits. The authors concluded, therefore, that the function of the muscle spindles and of local inhibitory reflexes remains unchanged in untreated Parkinson's disease as well as following L-dopa treatment.

Ibid., **34**, 6, December, 1971:

ASHBY, P., and BURKE, D.: Stretch reflexes in the upper limb of spastic man.

Authors' summary: The reflex response to stretch has been studied in the upper limb of 20 spastic patients. The amplitude

of reflex EMG was found to be closely related to the velocity of stretch. Reflex EMG in biceps and triceps muscles was augmented by increasing the length of the muscle, although minimal inhibition of reflex EMG in biceps was obtained in two patients by extreme stretch. The clasp-knife sensation in the upper limb cannot be related to autogenic inhibition but may be explained by the characteristics of a velocity-dependent reflex in which limb movement is braked by the mechanical effect of increasing muscle tension. It is suggested that this be called the pseudo-clasp-knife reaction to distinguish it from the clasp-knife phenomenon of the quadriceps muscle, since the underlying neurophysiological mechanism is quite different.

J. Physiol., **220**, 1 January, 1972, pp. 1-18:

STEPHENS, J. A., and TAYLOR, A.: Fatigue of maintained voluntary muscle contraction in man.

Summary: The authors studied the mechanism of fatigue in the first dorsal interosseous muscle of the hand. In the first minute the force produced fell to about 50% and was accompanied by a similar decrease in the smoothed rectified E.M.G. After the first minute the force fell more rapidly in relation to the smoothed rectified E.M.G., but tended to stabilize at about 25% after 2 minutes. After relaxation, the muscle recovered about 80% of its maximal voluntary contraction strength within 1.5 minutes, but recovery was sometimes still incomplete after 30 minutes. The smoothed rectified E.M.G. recovered similarly. When the tests were repeated during arterial occlusion by means of a cuff, the course of fatigue during the first phase (one minute) was similar, but during the second phase the force fell rapidly to zero. With the cuff retained during relaxation, the force failed to recover although the smoothed rectified E.M.G. on voluntary effort recovered to 70% within 1.5 minutes. No further recovery occurred until the cuff was removed after 2 minutes, after which the smoothed rectified E.M.G. recovered completely within the next 1.5 minutes. The recovery of voluntary force after removal of the cuff followed a similar pattern to that seen in the initial tests without arterial occlusion. The authors concluded that neuromuscular junction fatigue is responsible for the first phase of fatigue, followed by contractile element fatigue which is exacerbated by obstruction of the blood supply. They also believe that neuromuscular junction fatigue is more marked in high threshold motor units, whilst contractile element fatigue predominates in low threshold units.

Neurology, **21**, 11, November, 1971:

BERLIN, L.: A peroneal muscle stretch reflex.

Summary: An additional deep tendon reflex is described which may be of use in identifying L5—S1 root lesions. The foot is positioned in plantarflexion and inversion, with the examiner's index finger over the dorsum of the metatarsal heads, the tip exerting pressure over the ends of the 4th and 5th metatarsals (the article describes these as the 1st and 2nd metatarsals, but from the accompanying diagram and description it would appear that 4th and 5th is correct). The dorsum of the distal phalanx of the examiner's finger is then tapped briskly with a percussion hammer. In clinical use this reflex was found to be a more sensitive indication of L5—S1 lesions than the T-A reflex. It was absent in all of eleven patients tested, although the T-A reflex was variably affected. It was also found of value in distinguishing lesions of the n. peroneus communis.

OTHER ARTICLES OF INTEREST

J. Neurol. Neurosurg. Psychiat., **34**, 6, December, 1971:

1. UPTON, A. R. M., MCCOMAS, A. J., and SICA, R. E. P.: Potentiation of 'late' responses evoked in muscles during effort.

2. : Impaired Potentiation of H-reflexes in patients with upper motoneurone lesions.

Physiol. Reviews, **52**, 1, January, 1972:

CLOSE, R. I.: Dynamic Properties of Mammalian Skeletal Muscles. (A 56-page survey plus a very comprehensive list of 447 references.)