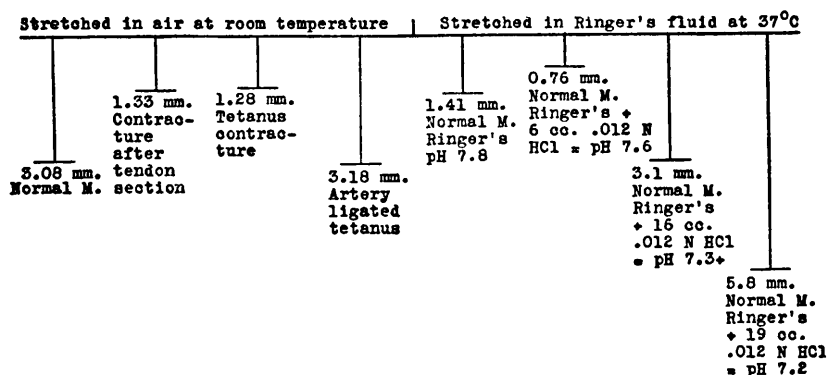


when exposed to the air, giving a permanent deformation of 3.1 mm. The addition of 19 cc. of .012 N HCl to 1000 cc. of standard Ringer gave a pH of approximately 7.2 and in this a muscle stretched more than when exposed to the air, giving a permanent deformation of 5.8 mm.

CHART I.

Variations in the ductility of muscle, expressed in mm. of permanent elongation caused by stretching. Since stress and time were the same in all experiments, the differences shown here were due to differences in the condition of the muscles.



It is, therefore, apparent that the ductility of muscle is influenced by relatively slight changes in the hydrogen ion concentration of the fluid with which it is bathed. It is obvious that these observations may have an important bearing on the problem of tonus and the function of muscles as organs for the maintenance of posture.

3759

The Lactic Acid Content of Resting Mammalian Muscle.

H. A. DAVENPORT AND HELEN K. DAVENPORT

(Introduced by P. A. Shaffer.)

From the Department of Neuroanatomy, Washington University Medical School.

The amount of lactic acid present in resting, atonic mammalian muscle is very low—10 to 20 mg. per 100 gm. of tissue. We have obtained values from 10.5 to 50 mg. by freezing *in situ* the gastrocnemius of guinea pigs with CO₂ snow. The animals were anesthetized with amytal and the muscles dissected as free from surrounding structures as possible without disturbing the nerve and

blood supply. Packing CO₂ snow around the muscle, starting at the insertion and proceeding to the origin, has given the lowest values for lactic acid.

Fletcher¹ found 59 mg. per cent in rabbit muscle, but excised the muscle before freezing it in liquid air. We have obtained similar results from animals which died (from the anesthetic) during the dissection, even though the muscles were frozen *in situ* immediately and without stimulation. It seems likely that mammalian muscle forms lactic acid with such rapidity when oxygenation is stopped that it is possible to obtain a value approximating the normal only when it is frozen with the circulation still intact.

We have used ice cold trichloroacetic acid (5% aqueous solution) as a protein precipitant. After freezing, the muscles were excised and the unfrozen portion at the origin discarded. They were then sliced, while frozen, into sections of about 0.1 mm. thickness and immediately dropped into the trichloroacetic acid. Lactic acid was determined by the Friedemann, Cotonio and Shaffer² procedure adapted to quantities between 0.02 and 0.2 mg.

¹ Fletcher, W. M., *J. Physiol.*, 1914, xlvii, 361.

² Friedemann, T. E., Cotonio, M., and Shaffer, P. A., *J. Biol. Chem.*, 1927, lxxiii, 335.

3760

Inhibition of Lactic Acid Formation in Muscle by Extract of Desiccated Pancreas.

E. RONZONI. (Introduced by D. P. Barr.)

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Hopkins and Winfield¹ showed that extracts of pancreas could inhibit the formation of lactic acid in chopped muscle. This work did not exclude the possibility that the inhibitory factor was trypsin. Foster and Woodrow² working in Hopkins' laboratory made further investigation of this substance. They found that it was neither trypsin, insulin nor anti-glyoxylase, and that heating it for 10 minutes at 85° C. greatly reduced its activity but did not completely destroy it. They reported an inhibition between 40 and 60% of the total lactic acid which was formed in control samples of muscles, a fact which they interpreted as evidence of two mechanisms for lactic