

morphology. *Such cultures only* have produced the mucoid growth in the alkaline neo-peptone glycerol broth, a growth which, so far, has not occurred in any other liquid medium tested. Further work is in progress as to the exact rôle played by this medium and the factors responsible for bringing to maturity the dissociation of the mucoid phase, which appears to be initiated in the aging cultures on Petroff's or other egg-mediums. Steenkin⁵ has also noted the relationship between softening growth and pleomorphic rods of old tubercle cultures on egg-mediums; and particularly the eventual out-growth of variants from the softened areas which, in his experience, however, were not mucoid.

10391 P

Magnesium and Calcium in Striated Muscle as Revealed by the Electron Microscope.*

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Several years ago McMillen and Scott¹ described a simple magnetic electron microscope designed for use in localizing certain inorganic salts in biological tissues. After some modifications of this apparatus, mostly in the direction of increasing the magnification,² and much experimentation it has been possible for us to localize magnesium and calcium in tissues. Striated muscle is an appropriate tissue for the purpose since it has been shown by other methods that the salt distribution is orderly and precise.^{3, 4}

The nearest approach to chemical conditions obtaining in the living is had by examination of tissues prepared for study by the Altmann-Gersh frozen dehydration method. Sections of tissues fixed by a modification of this technic were attached to a barium and strontium coated cathode and placed in the electron microscope. After evacuation of the instrument the cathode was heated slowly and the section vacuum-distilled until only the inorganic salts remained. The

⁵ Steenkin, W., Jr., *Am. Rev. Tuberc.*, 1938, **38**, 777.

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¹ McMillen, J. H., and Scott, Gordon H., *Rev. Scientific Inst.*, 1937, **8**, 288.

² Scott, Gordon H., and Packer, D. M., *Anat. Rec.*, 1939, in press.

³ Scott, Gordon H., *Proc. Soc. Exp. Biol. and Med.*, 1932, **29**, 349.

⁴ Scott, Gordon H., *Am. J. Anat.*, 1933, **53**, 243.

temperature of the cathode was raised further until active electron emission occurred. The electron source was imaged upon the fluorescent screen with appropriate magnetic lenses. Photographs were then made of the luminescent image.

After many tests with pure salts of magnesium and calcium it was determined that the electron source, responsible for the image, was these elements. Examination of such preparations enabled us to localize with some accuracy magnesium and calcium in striated muscle from several mammalian species. Due to the preliminary freezing process muscle is thrown into many strong contractions. In every case we could localize magnesium and calcium in these contraction bands. Little or none of these elements was present in the remainder of the sarcoplasm. It is also of some interest that there was no magnesium or calcium detected in the "tissue spaces" of Fenn.⁵ Apparently the bulk of these elements existing in muscle is to be found in the muscle cells and not in the connective tissue. Naturally some must be present there since both magnesium and calcium must be transported to and from capillary and muscle cell.

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Preliminary *in vitro* Studies of Melanophore-Principle Activity of the Pituitary Gland.*

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An attempt was made to correlate the melanophore-dispersing hormone of the hypophysis with melanin production through the use of a known oxidase system (tyrosine-tyrosinase). The oxygen consumed in this system was measured with the Warburg apparatus. The melanophore-containing fractions were prepared by a modification of Stehle's method.¹ Acetone-desiccated powders prepared from (a) anterior and (b) posterior lobe beef pituitary glands, and (c) from the anterior lobe of sperm whale pituitary glands served as source material for the preparation of the various melanophore

⁵ Fenn, W. O., *Symposia on Quantitative Biology*, Biological Laboratory, Cold Spring Harbor, N. Y., 1936, 4, 252.

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¹ Stehle, R. S., *J. Pharm. Exp. Therap.*, 1936, 57, 1.