phorescent organs along the sides were in good condition. One of the specimens was given to the Boston Society of Natural History as a member of the New England fauna; the other was presented to the Museum of Comparative Zoology at Harvard. The swordfish was taken on the eastern border of the Georges Banks, a little inside the 500 fathom line. From this it would appear that the swordfish do descend to considerable depths for their meals, and, from the good condition of the specimens, it would appear that they make a rapid transition from the feeding grounds to the surface for the after-dinner siesta.

J. S. KINGSLEY

2500 CEDAR STREET,
BERKELEY, CALIFORNIA

EXPERIMENTAL TRANSFORMATION OF THE SMOOTH-BLADDER OF THE DOG

THE essential difference between the pale smooth muscle of the bladder and the red involuntary striated muscle of the heart is dependent upon the differential intensity of the hydro-dynamic pressure to which the vesicular and cardiac mesenchymal cells have been subjected, respectively. By experimentally varying the velocity of application and the intensity of the intra-vesicular pressure, which causes tension of the smooth bladder muscle, during a period of eight weeks, to a point comparable with that found in the heart the non-striated bladder muscle is transformed histologically into cross-striated muscle, and physiologically into an organ manifesting rhythmicity as long as the hydro-dynamic pressure stimulus is applied.

From the dynamic or functional, embryological viewpoint the various muscles, smooth, cardiac and skeletal represent differences in the amount of *work* that has been done upon them by the differential growing parts of the embryo during the active periods of growth.[1] The essential difference then physiologically between the various muscles is their capacity for work which in turn is dependent upon the amount of work that has been expended in their production. The reason for the different degrees of energy possessed by the types of muscle is purely an embryological bio-mechanical problem and corresponds to the differential amount of optimum tension which these muscles have experienced during their formative period because of a dominant energetic zone extrinsic to the region of myogenesis. The evidence presented by these experiments warrants the conclusion that as regards cross-striated muscle, function determines structure and not the reverse.

The writer wishes to thank Dr. Charles R. Bardeen, University of Wisconsin, for rechecking the evidence leading to the above conclusions.

EBEN J. CAREY
MARQUETTE UNIVERSITY MEDICAL SCHOOL,
MILWAUKEE, WISCONSIN

AN ALBINO MUTATION OF THE DEMATIACEOUS FUNGUS BRACHYSPORIUM TRIFOLII

THIS fungus has been under study in culture since October, 1919, when it was first isolated from clover plants. A description was published in *Phytopathology*, October, 1920, and an intensive culture study of the fungus has been continued since that time. The cultures were started from a single spore and have been kept going as a pure strain ever since.

The normal fungus is of the dematiaceous type, with dark brown hyphæ, forming in culture a very dense black mat on and in the medium.

On one of a series of cultures made early in November 1921 there appeared, starting from the point of inoculation, a sector of growth which completely lacked the black-brown color of the normal mat. A microscopic examination showed that the mycelium and conidia of this light-colored area were morphologically identical with those of the normal growth of the fungus, except for the lack of the dark brown color.

Isolation cultures were made of this albino material by the isolation of sclerotia-like

[1] Carey, E. J., 1919-20, *Journ. of Gen. Physiol.*, (*a*) ii, 357; (*b*) iii, 61; (*c*) *Anat. Record*, 1920, xix, 199.