$138 \times 10^{-8}$ and $28.3 \times 10^{-8}$ e.s.u. per dyne at 0° C. The changes in the values for the *b* and *c* directions per degree rise in temperature are, respectively, $+ 6.8 \times 10^{-9}$ and $3.1 \times 10^{-10}$ between $-60$ and $+30$° C. The figure shows that the ions which produce the piezo-electric polarization move much more freely in the *a* direction in the crystal, especially in the temperature range from $-20$° C. to $+25$° C. Measurements of the dielectric constants also give results of the same nature. It was found, moreover, that the electrical anomalies, such as fatigue, hysteresis and residual charges, are relatively much smaller in the *b* and *c* directions. Although the crystal cut normal to the *b* direction is much less active than one cut normal to the *a* direction, the absence of these irregularities and of the large temperature coefficient just above ordinary room temperature would make the crystal cut in this way more useful in practical applications of the piezo-electric effect. It is still about twenty times as active as quartz.

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## THE INFLUENCE OF EPINEPHRIN AND OF THE SYMPATHETIC SYSTEM ON SKELETAL MUSCLE FIBERS AND CAPILLARIES

IT is possible to observe skeletal muscle fibers and their circulation under the high power of the microscope, by a method which will be described later. Cats have been used in these observations.

Epinephrin in small doses (.2 to .4 cc, 1:100,000) causes muscle capillaries and venules to dilate. New capillaries open while those already open may dilate further. The field becomes brighter, individual fibers show more clearly and the striations of the fibers appear or become clearer if already visible.

Larger doses (.8 cc to 3 cc, 1:100,000) cause constriction of capillaries, some of which entirely disappear. Stronger doses than these cause closing of many more capillaries and much more marked constriction.

Epinephrin caused twitching of the muscle fibers sometimes even with the small doses, although the larger doses cause more marked and more lasting effects. The twitching is at right angles with the longitudinal axis of the fibers.

Epinephrin also causes the intestinal villi to become more transparent. It has a similar action upon the bladder.

Stimulation of the lumbar sympathetic with weak induction shocks causes the field to become more opaque. Many new capillaries and venules open (skeletal muscle) and those already open dilate. As the stimulation is increased the field becomes more transparent, striations of the muscle fibers become visible or if already visible they become clearer. The fibers also respond by rapid transverse vibration which changes to twitching when the stimulus is increased.

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## THE INDIANA ACADEMY OF SCIENCE

THE Indiana Academy of Science held its forty-second annual meeting at Ball Teachers College, Muncie, Indiana, on December 2, 3 and 4. A total of 80 papers was presented. These were distributed among the various sections as follows: General meeting, 8; Botany, 22; Zoology, 19; Chemistry-Physics-Mathematics, 15; Geography-Geology, 12, and special meeting on the Teaching of Science in the High School, 4.

The officers in charge of the meeting were:

*President,* Dr. W. M. Blanchard, De Pauw University, Greencastle; *Vice-president,* L. J. Rettger, Indiana State Normal, Terre Haute; *Secretary,* Dr. Ray C. Friesner, Butler College, Indianapolis; *Assistant Secretary,* Dr. W. P. Morgan, Indiana Central University, Indianapolis; *Acting Treasurer,* Dr. H. E. Enders, Purdue University, Lafayette; *Editor,* J. J. Davis, Purdue University, Lafayette.

The public lecture of the academy on the evening of December 3 was given by Professor W. H. Hobbs, of the department of geology, University of Michigan, who spoke on "The First Greenland Expedition of the University of Michigan." This talk was illustrated by two reels of motion pictures of the expedition.

Preceding the regular meetings of the academy, the entomologists of Indiana held their annual informal round table and discussed the scientific and economic problems of current interest in the state.

The newly elected officers for the year 1927 are as follows:

*President,* Frank B. Wade, Shortridge High School, Indianapolis; *Vice-president,* Fred J. Breeze, Ball Teachers College, Muncie; *Secretary,* Dr. Ray C. Friesner, Butler College, Indianapolis; *Assistant Secretary,* Dr. W. P. Morgan, Indiana Central University, Indianapolis; *Treasurer,* Dr. Marcus W. Lyon, Jr., South Bend; *Editor,* J. J. Davis, Purdue University, Lafayette; *Assistant Press Secretary,* Dr. J. A. Nieuwland, Notre Dame University, South Bend.

Notre Dame University was chosen as the place for the next annual meeting.

HARRY F. DIETZ,
*Press Secretary*