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Physical Science

THE INFLUENCE OF CERTAIN PHYSICAL FACTORS ON ROD AND CONE DARK ADAPTATION

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ABSTRACT

Results of investigations were presented concerning: (1) the beneficial effects of oxygen on the threshold levels of rods and cones at relatively low altitudes (for example, 5,000 to 7,000 feet) and under various untoward environmental and physiological circumstances; (2) the effects of fasting and ingestion of food and the role of basal metabolism on the levels of dark adaptation and the role of oxygen, as well as the general stabilizing action of oxygen; (3) the effects of exposure to red, green, and white lights of low and of relatively high intensities on dark adaptation and their significance in aviation; (4) the reduction of light sensitivity by smoking cigarettes. (Data show that two to five-fold as much light is needed as previous to smoking. The effects generally slowly decrease and last ordinarily from 15 to 30 minutes, and on occasion for an hour, subsequent to the cessation of smoking); (5) the results obtained on the effects of a series of repeated exposures to light of various intensities and durations, and at various altitudes to 18,000 feet. (In general these results indicate very favorable action of breathing oxygen on the maintenance of the best levels of dark adaptation possible under the circumstances.)

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RAPID AND DIRECT MEASUREMENT OF VAPOR PRESSURE OF LIQUID METALS*

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ABSTRACT

The vapor pressure of liquid metals can be obtained rapidly and directly by measuring the force of impact of the vapor particles

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on a surface. The essential part of the vacuum microbalance is a quartz spiral supporting a bucket, on the lower surface of which the vapor particles impinge and condense. By interrupting the vapor beam with a shutter the elevation of the bucket produced by the beam can be measured with a micrometer-microscope. Calculations are based on kinetic theory:

$$p = \frac{2 \pi F}{dS d\omega}$$

where p is vapor pressure, F is force of impact, dS is area of effusion orifice, and $d\omega$ is the solid angle subtended by dS to the liquid surface. Vapor pressure of bismuth obtained in a preliminary experiment by this method is in fairly good agreement with the values obtained by other experimenters.

↑ ↑ ↑

OBSERVATIONS ON THE ESCAPE OF RADON FROM VASELIN*

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Vaselin in which radon has been dissolved is occasionally used as a therapeutic agent for treating lesions of the skin. The effects produced by these treatments are generally considered to be due to alpha and beta irradiation of the tissue. A layer of vaselin from 1 to 5 mm. thick containing from 20 to 100 microcuries of radon in each cubic centimeter of vaselin is spread over the area to be treated. The area is then covered with rubber or some plastic material, the edges of which are sealed to the skin with adhesive tape, to prevent the escape of radon. The observation that some vaselin containing radon, which had been poured into a cup and left in a ventilated hood, still fluoresced after being exposed to the air for several days, suggested that the escape of the radon was slow. Additional tests and observations indicated that while radon near the surface escaped quickly it diffused through the vaselin at a slow rate when at or near room temperature.

A layer of radon-vaselin a few millimeters thick will fluoresce for several weeks when left in a well-ventilated place at room temperature. The intensity of the fluorescence gradually decreases, as would

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