

that the diameter does not depend on sex or on the colour of the iris. The diameters of the pupils of both eyes were found to be the same. We found, however (Fig. 2), a visible increase in the mean error (dispersion of values) with age.

V. KADLECOVÁ
M. PELEŠKA

2nd Eye Clinic,
Charles University,
Prague.

A. VAŠKO

Research Institute of Optics
and Fine Mechanics,
Prague.

- ¹ Trendelenburg, W., "Der Gesichtssinn" (Berlin, 1943).
² Schieck, F., and Brückner, A., "Kurzes Handbuch der Ophthalmologie", 2 (Berlin, 1932).
³ Schöber, H., "Das Sehen", 1st edit. (1950), 2nd edit. (1957).
⁴ Robertson, G. W., and Yudkin, I., *J. Physiol.*, **103**, 1 (1944-45).
⁵ Havelka, B., "Geometrická optika", 2 (Prague, 1956).
⁶ Birren, J. E., Casperson, R. C., and Botwinick, J., *J. Gerontol.*, **5**, 216 (1950).
⁷ Vaško, A., and Peleška, M., *Brit. J. Ophthalmology*, **31**, 419 (1947).
Peleška, M., and Vaško, A., *Fysika v technice*, **2**, 199 (1948).
Kadlecová, V., and Peleška, M., *Cs. Ophth.*, **11**, 260 (1955); **13**, 278, 283 (1957).
⁸ Seitz, R., *Klin. Mbl. Aug.*, **131**, 48 (1957).

Influence of Hydrocortisone on the Action of Sodium on Isolated Rabbit Auricles

SZENT-GYÖRGYI¹ has demonstrated the importance of the 'intracellular ionic atmosphere' on the contraction of the cardiac muscle, and has suggested that adreno-cortical steroids may influence cellular activity by alterations in membrane permeability. It has also been shown by Selye and Renaud² that the action of electrolytes on the heart is influenced by what is termed the 'conditioning' effect of hormones. Further, Holland³ has presented evidence to show that antiarrhythmic drugs act on the atria by depressing the transmembrane flux of sodium and potassium ions. In this connexion, it would be of interest to examine the effect of the steroid hormones on the action of the ions on the heart. It is well known that when the heart is kept in a medium containing sodium as the only ion it stops beating after some time. Later, when the medium is changed to Ringer solution, the beat recommences, presumably due to sodium extrusion. If a steroid hormone altered the permeability of the cell membrane, it would modify the action of sodium by interfering with sodium traffic across the membrane.

In order to examine this possibility, isolated rabbit atria were kept in oxygenated Ringer solution in a thermostatic organ bath at 37° C. and the contractions recorded on a kymograph. After obtaining normal contractions, the Ringer solution was replaced by physiological saline. There was inhibition of the atrial contraction within a short time. On replacing Ringer solution in the bath the contractions recommenced. Addition of hydrocortisone (kindly made available by Mr. A. V. Mody, Unichem Laboratories, Bombay) to the bath in quantities sufficient to give a final concentration of 25 µgm./ml. resulted in inhibition of the atria. The beats, however, recommenced on changing to fresh Ringer solution, but now replacement of the medium by sodium chloride solution did not result in an early inhibition of the contractions. The inhibitory effect of sodium was significantly postponed by an extremely short pretreatment with the steroid hormone. In fact, in some instances

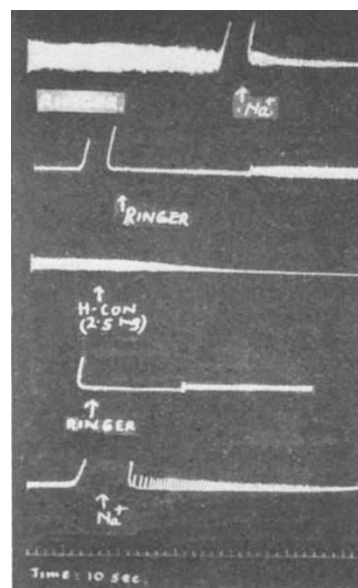


Fig. 1. Effect of hydrocortisone on the action of sodium ions on isolated rabbit auricles

the sodium in the external medium now caused an initial increase in the amplitude of the contraction of the atria. The results are shown in Fig. 1. It is suggested that such an action of the hormone could be due to altered myocardial excitability because of imprisonment of intracellular ions caused by a change in the cell membrane permeability by the steroid.

My thanks are due to Mr. N. M. Chavan for all the technical assistance rendered.

T. H. RINDANI

Department of Physiology,
Topiwala National Medical College,
Dr. A. L. Nair Road,
Bombay 8.
Sept. 1.

- ¹ Szent-Györgyi, A., *Rev. Canad. Biol.*, **12**, 117 (1953).
² Selye, H., and Renaud, S., *Amer. J. Cardiol.*, **1**, 208 (1953).
³ Holland, W. C., *Amer. J. Physiol.*, **190**, 63 (1957).

Isolation of Active Mitochondria from Apples

In recent studies on the physiology of ripening in fruits, attention has been focused on the possible relationship between phosphorylative processes and the climacteric rise in respiration¹⁻³. Since many respiratory enzymes are located in the mitochondria, the isolation of these subcellular units in an active state is of great importance in such investigations. Although the apple is the classic object for studies in fruit physiology, attempts to prepare particulate fractions with mitochondrial activity from apples have not been successful. Lieberman⁴ isolated particles with cytochrome oxidase activity by grinding apples in a medium containing *tris*-hydroxymethyl aminomethane at pH 9.2. By using a homogenizing medium buffered at pH 7 with 0.5 M phosphate, Neal and Hulme⁵ obtained apple particles which oxidized succinate and malate to a slight extent, but only in the presence of the phenolic compound protocatechuic acid. Pearson and Robertson² isolated