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## A Further Study of Color Discrimination of Color-Blind Subjects

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seconds obtained 90 seconds after the injection of pituitrin or pitressin.

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## AN INEXPENSIVE DIRECT CURRENT AMPLIFIER

R. D. HUNTOON

In an attempt to increase the stable sensitivity of the direct current amplifier designed by Voorhis, it developed that the commercial tube, type 2A6, is particularly suited to such work. A single 2A6 in a circuit similar to that of Sallu gave a sensitivity of  $3 \times 10^{-3}$  amps./mm. with a galvanometer of sensitivity,  $10^{-8}$  amps./mm. An arrangement with a portable microammeter and an a.c. power supply resulted in a useful portable high impedance galvanometer with a sensitivity of  $10^{-11}$  amps./mm.

The circuit is discussed and methods of balancing explained. It is shown that adjustments are not critical and the amplifier is sufficiently stable.

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## A FURTHER STUDY OF COLOR DISCRIMINATION OF COLOR-BLIND SUBJECTS

A. A. BENEDICT

Thirty-two markedly color-blind subjects were given the Ishihara, Holmgren, and Nagel tests of color vision. In addition, each was given a test series of forty-two pairs of spectral colors at equal and known relatively unequal intensities by means of a spectrometer and spectrophotometer.

Of the total of 1344 matchings of pure spectral colors, 44 or 33 per cent were matched with the wave length near the complement of the standard presented. 35 out of the 44, or 79.2 per cent of the confusions occurred with the long wave lengths used as the standard, although 8 of the 14 standard bands were of the

shorter wave length. The remaining 9 or 20.8 per cent occurred when the short wave length was used as the standard. Only 6 out of the 32 markedly color-blind students confused the wave bands in the red and the green. No band below 4950 Å was confused in the green, but all bands studied from 6200 to 6800 Å were almost equally confused with the possible exception of 6600 Å which seemed less disturbing.

The experiments seem to indicate that color-blind subjects do not match colors by intensity and that unequal intensities do not affect color discrimination of relatively pure colors.

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### THE SCATTERING OF POTASSIUM IONS IN MERCURY VAPOR

ARTHUR ROUSE

An apparatus has been designed to measure the angular distribution loss of potassium ions scattered in mercury vapor. The range of accelerating voltages was from 20 to 300 volts, and the range of scattering angles was from 60° to 150°. Preliminary curves have been obtained showing the angular distribution and energy loss. A comparison has been made with the theoretical curves of Massey, Mott, and Mohr. The results show what points must be more completely investigated.

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### THE ZERNIKE AND PRINS METHOD OF COMPUTING X-RAY DIFFRACTION INTENSITIES IN LIQUIDS

DONALD O. HOLLAND AND G. W. STEWART

A study has been made of the nature of the approximation in the Zernike and Prins formula by using it with an ideal simple cubic crystal. The computations show the following:

(1) That the use of one term in addition to the integral term