

in the continuum with a fivefold change in the vapor pressure. The limits of this band are not definite, but most

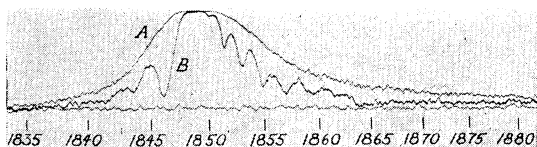


FIG. 1. Diffuse band in mercury afterglow. *A*—without oxygen absorption bands; *B*—with oxygen absorption bands.

of the energy is found between 1870Å and 1835Å with a maximum near 1849Å.

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<sup>1</sup> R. Garth and G. Moore, *Phys. Rev.* **60**, 208 (1941); G. Moore and R. Garth, *Phys. Rev.* **60**, 216 (1941).

<sup>2</sup> Lord Rayleigh, *Proc. Roy. Soc.* **114**, 620 (1927).

<sup>3</sup> H. Hamada, *Phil. Mag.* **12**, 50 (1931).

<sup>4</sup> W. Finkelburg, *Kontinuierliche Spektren* (Berlin, 1938), p. 202.

### Erratum: The Mercury Arc Cathode

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THE Thomson heat was assumed to convect heat upward in the liquid mercury cathode, and the magnitude was calculated from an apparently erroneous formula

taken from page 96 of the book, *The Metallic State* by Hume-Rothery. The heat  $Q$  convected by unit current due to the Thomson heat  $\sigma$  acting in a region of thermal gradient  $d\theta/dz$  was taken to be  $Q = \sigma(d\theta/dz)$ , as stated in the book. The convection of heat by unit electric current has been shown by Bridgman<sup>1</sup> to be  $Q = \tau \int \sigma^*(\sigma/\tau) d\tau$ . This is the heat convected past a point in a metal at absolute temperature  $T$ . Reasonable values of  $\sigma$  put into this formula lead to a value of  $Q$  only about  $10^{-5}$  of that obtained by applying the first formula, under the assumed conditions.

Therefore, the simple assumption that  $Q$  was sufficient to counteract the thermal conduction  $K(d\theta/dz)$  is not tenable without new considerations.

Recent observations of the continuous spectrum of the arc spot of the mercury arc cathode and observations upon a number of metallic arcs showing the peculiar retrograde motion in a transverse magnetic field, and other phenomena, are soon to be reported. In the report we expect to present a revised treatment of the thermal conduction problem in the cathode material as related to the Thomson heat.

The writer is very grateful to Dr. J. Slepian and to Mr. R. L. Longini of the Westinghouse Electric and Manufacturing Company for pointing out the error in the paper.

<sup>1</sup> P. W. Bridgman, *The Thermodynamics of Electrical Phenomena in Metals* (The Macmillan Company, New York, 1934), page 65.