(4) Procès-Verbaux Comité Int. Poids et Mésures [2] **12**, 67 (1927).
(5) Trans. I.A.U. **2**, 47, 232 (1925).
(6) Procès-Verbaux Comité Int. Poids et Mésures [2] **17**, 91 (1935).
(7) Trans. I.A.U. **6**, 79 (1939).
(8) Trans. I.A.U. **5**, 86 (1936).
(9) J. E. Sears and H. Barrell, Proc. Roy. Soc. **A139**, 202 (1933).
(10) A. Pérard, Comptes rendus **198**, 727 (1934).
(11) C. V. Jackson, Proc. Roy. Soc. **A155**, 407 (1936).
(12) W. E. Williams and D. V. Gogate, Proc. Roy. Soc. **A167**, 509 (1938).
(13) W. F. Meggers and C. J. Humphreys, unpublished.
(14) H. Buisson and Ch. Fabry, J. de Phys. [5] **2**, 442 (1912).
(15) H. Westmeyer, Zeits. f. Physik **94**, 590 (1935).
(16) R. Minkowski and H. Bruck, Zeits. f. Physik **95**, 284 (1935).
(17) K. W. Meissner, J. Opt. Soc. Am. **32**, 196 (1942).
(18) W. Alvarez and J. Wiens, Phys. Rev. **58**, 1005 (1940).
(19) A. A. Michelson, Phil. Mag. [5] **34**, 280 (1892).

DISCUSSION

S. Mrozowski, *University of Chicago:* Although at first I was very enthusiastic about the use of the line 5461A emitted by the single isotope 198 of mercury for the primary standard of wave-length, I gradually became more and more pessimistic as I tried to develop a source of light which would show as little absorption of gas as possible. In the original arrangements of Wiens and Alvarez for Hg^{198} and of Segrè and myself for investigations of some other substances obtained by bombardment in the cyclotron, the gas obtained in the discharge tube disappears by absorption in a few minutes. Following a suggestion by Professor Dempster I developed here in Chicago a hollow cathode tube of a total volume of 1 cm^3, which, filled with helium at 1 mm, has been operated for more than 36 hours at 60 ma before the gas disappeared by absorption. Mercury vapor probably would be absorbed much sooner, perhaps in the course of some 4–6 hours. Even such a source is far from being satisfactory for the determination of the wave-length of a primary standard and for the subsequent comparison with secondary standards. I would therefore suggest using for the primary standard one of the lines of lead, since the even isotopes of this element can be obtained in a relatively pure state (uranium or thorium lead) and in a not too small quantity. As a source, a hollow cathode discharge tube should be satisfactory.

G. S. Monk, *University of Chicago:* Professor Meissner suggested the use of an atomic beam source for the primary standard. Several questioned the practicability of this on account of its complexity and cost.

Later in the day the writer demonstrated a new type of cadmium source. This consisted of a capsule of glass or quartz of about 5- to 10-cc volume with a very small amount of cadmium distilled into it. The capsule is energized by a high frequency high voltage oscillator, and is started by preheating with a Bunsen burner or hand torch. Preliminary measurements show that the wave-length is the same as that obtained with a Michelson tube. The line width depends upon the amount of cadmium vapor in the tube, and this must be carefully controlled.