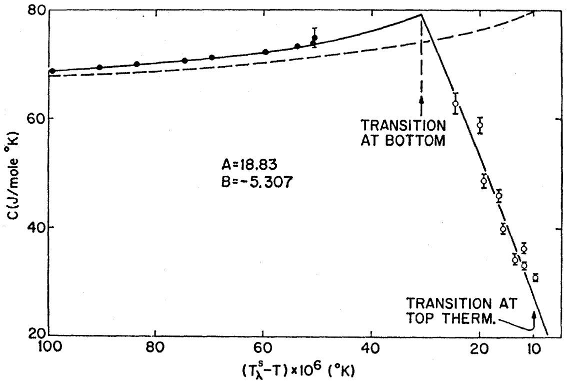

FIG. 8. The heat capacity of the superfluid from 7×10^{-5}°K below to 2×10^{-5}°K above the lower transition. The data are normalized to one mole of total helium. The dashed line is the heat capacity calculated from the coefficients and Eq. (5) for a short sample.

line shows the corresponding heat capacity of a flat sample [Eq. (5)]. The error bars on the points correspond to the estimated probable errors. Where no error bars are shown, the estimated errors are smaller than the size of the points.

In the two-phase region the measurements agree well with Eq. (11). The scatter is somewhat larger than expected from the estimated probable errors. This may be due to slight irregularities in the foredrifts and afterdrifts due to heat transfer into the normal phase. The data fully confirm the classical behavior of the system.

Superheating of He^4 II

Although it was the purpose of this work to determine equilibrium properties of He^4, it was observed occasionally with certain heater powers that He^4 II can be superheated above its equilibrium transition temperature. This is already evident in Fig. 4 at point D for the top thermometer. The equilibrium-transition temperature should have been observed at the dashed line. In reality, with a heater power of 1.9×10^{-6} W, corresponding to an interface velocity of 9 cm/min, the transition occurred at 1.0×10^{6}–°K above the equilibrium-transition temperature. This corresponds to a height lag of 0.8 cm and a time lag of 5.5 sec. Point D, Fig. 4, is also shown in Fig. 6, and is seen to be high. A similar effect was seen on some other occasions. Figure 9 shows the observed transition temperature at the top thermometer upon several heating and cooling cycles. Cooling was always at 4×10^{-7} W, and, therefore, gave the equilibrium-transition temperature. Heating was at 2.6×10^{-6} and 6×10^{-7} W. At 2.6×10^{-6} W, the transition temperature was raised by 2.7×10^{-6}°K. It does not appear possible to explain these findings on the basis of thermal time constants of the walls and the thermometer, or on the basis of other experimental factors, and the observed effect is believed to be a property of liquid He^4. However, the effect could not be consistently reproduced and appeared to depend on the thermal history of the sample. At very large heating rates (10^{-4} W), generally no overheating was observed.

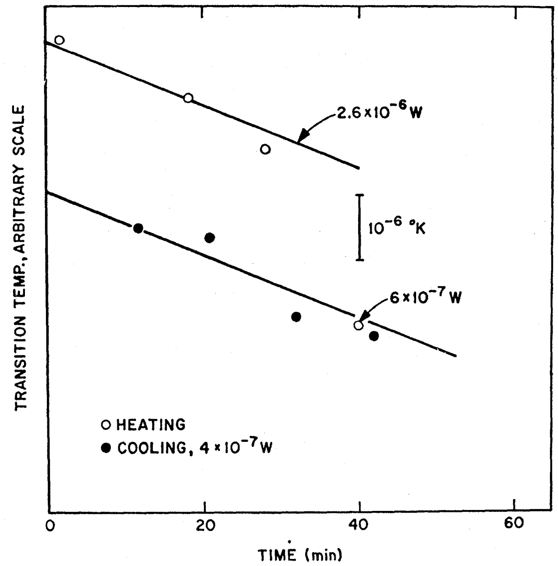

FIG. 9. Superheating of He II at the top thermometer.

ACKNOWLEDGMENT

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Erratum

Study of $H_2^+ + H_2 \rightarrow H_3^+ + H$ Using Merging Beams, R. H. NEYNABER AND S. M. TRUJILLO [Phys. Rev. **167**, 63 (1968)]. In Fig. 2 the line designated as Gioumousis and Stevenson (GS) should be ignored. The other line has the energy dependence predicted by GS, since it is a $W^{-1/2}$ fit to the low-energy experimental points. The last column in Table I should be disregarded. These changes result in obvious, minor corrections to the text but do not alter any of the general conclusions reached in the paper.