

low temperature heat capacity work and found that PICKARD and SIMON's data were, indeed, in error; and using their new data, the entropy discrepancy was reduced from 0.2 e.u. to the trivial difference of only 0.07 e.u. There was no evidence reported in this study of a phase transition. It was suggested<sup>(6)</sup> that if there were a phase transformation "...the kinetics of transition... (at low temperatures) would be extremely unfavourable, and it might be necessary to cold-work the metal in order to induce the phase change, as BARRETT found necessary for Li", but there was no immediate follow-up on this suggestion.

So the matter stood, and BRIDGMAN's zero pressure transition remained an elusive will-o'-the-wisp until 1958, when it was finally found and reported by SWENSON.<sup>(7)</sup> As predicted, the transformation was sluggish and required cold work, and it occurred at 79°K. In a later paper,<sup>(8)</sup> the structure of this so-called  $\beta$ -Hg was studied in great detail. It was found that the normal rhombohedral  $\alpha$ -Hg was transformed into a tetragonal body-centred structure, with

$$a = 3.995 \text{ \AA}, \quad c = 2.825 \text{ \AA}.$$

A few years later,<sup>(9)</sup> SCHIRBER and SWENSON studied the transformation kinetics further, and reported that it was martensitic, like the corresponding phase changes in Li and Na.<sup>(10)</sup> Finally, the thermodynamics of the  $\alpha \rightarrow \beta$  transition was studied by KLEMENT, JAYARAMAN, and KENNEDY.<sup>(11)</sup>

The references cited are by no means complete, but include the most important ones. There is, at the present time, no room for doubt that the transformation is real. It is interesting to note that it took 23 years to verify BRIDGMAN's speculations on this subject.

<sup>(6)</sup> Letter to W. F. GIAUQUE from L. F. EPSTEIN, Oct. 15, 1952.

<sup>(7)</sup> C. A. SWENSON, *Phys. Rev.* **111**, 82 (1958).

<sup>(8)</sup> M. ATOJI, J. E. SCHIRBER and C. A. SWENSON, *J. chem. Phys.* **31**, 1628 (1959).

<sup>(9)</sup> J. E. SCHIRBER and C. A. SWENSON, *Acta metall.* **10**, 511 (1962).

<sup>(10)</sup> (a) C. S. BARRETT, *Phys. Rev.* **72**, 245 (1948); (b) C. S. BARRETT, *Acta crystallogr.* **9**, 671 (1956); (c) C. S. BARRETT, *J. Inst. Metals* **84**, 43 (1955); (d) C. S. BARRETT and O. R. TRAUTZ, *Trans. Am. Inst. Min. Engrs.* **175**, 579 (1948); (e) J. S. DUGDALE, *The Influence of the Martensitic Transformation in Lithium and Sodium on Their Physical Properties*, Report of the National Research Council of Canada, Ottawa (1958).

<sup>(11)</sup> W. KLEMENT, JR., A. JAYARAMAN and G. C. KENNEDY, *Acta metall.* **10**, 511 (1962).