three days, its transition temperatures returned to their initial values. At low pressures the variation with pressure exhibits the well-known curve.*

4. DISCUSSION OF RESULTS

The present measurements have confirmed the small initial increase in the T_c (p) function that had been established from observations of thermal expansion. They indicated, however, that at higher pressures (p $>$ approx. $10 \cdot 10^3$ kg/cm^2) the transition temperature is greatly affected in Nb as well. In the $10 \cdot 10^3$ kg/cm^2 to $20 \cdot 10^3$ kg/cm^2 range the mean pressure coefficients for all the Nb specimens investigated** lie between $2.8 \cdot 10^{-5}$ °K cm^2/kg and $4.4 \cdot 10^{-5}$ °K·cm^2/kg, that is, at values whose magnitude do not differ from those observed for the so-called soft superconductors.

The curve of transition temperature versus pressure for Nb is fundamentally different from those of the so-called soft superconductors. The conjecture advanced by Andres, Olsen, and Rohrer /2/ that the transition metals exhibit a special kind of pressure behavior may be fully corroborated in a somewhat extended sense. From this point of view it would appear to be particularly interesting to investigate other transition metals, such as Ta or V, up to higher pressures, in order to learn whether the variation with pressure that has been found in the case of Nb is typical of the transition metals. Köhnlein's measurements /6/ confirm this conjecture.

There is as yet no plausible interpretation of the variation of T_c with pressure discovered for Nb in terms of a microscopic theory. The BCS /Bardeen-Cooper-Schrieffer/ theory yields the following expression for T_c:

$$T_c = 0{,}85 \cdot \Theta \cdot \exp - (1/N(0) \cdot V),$$

Θ = the Debye cut-off temperature

N(0) = density of states at the Fermi level

V = the interaction parameter of electron-electron interaction

Comparison with the soft superconductors, the lattices of which are not basically different from those of the transition metals, justifies the assumption that the pressure affects T_c essentially via a change in the parameter $N(0) \cdot V$, rather than via a change in Θ.

If the observed variation with pressure is characteristic of the transition metals, a plausible assumption is that the special band structure of the transition metals is an important factor. Whether the observed variation of T_c may be directly ascribed to a shift of the Fermi level toward the vacant bands or much greater changes occur in the density of states when the unit cell becomes smaller must remain a moot question, however.

Further exploration of this problem requires investigation of other transition metals as well as an extension of our experiments to higher pressures, so

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* As one electrode broke off, we were unable to cover the entire pressure range.

** 10 Specimens were tested.