It was not possible to put the thermocouple junction inside the tantalum tube in the lead itself, because lead and platinum alloy when heated, which is why the thermocouple junction was spot-welded to the outside of the tantalum tube. Since the junction would not measure the true temperature of the lead inside the tube, it was necessary to correct the temperature readings that were obtained to indicate the true melting temperature of the lead. Once again, a technique developed by my predecessor, Dr. J. Duane Dudley, was employed.

> Let t be the temperature of the sample, and t_m be the temperature measured by the thermocouple at its position on the outside of the sleeve (tantalum) containing the sample. Let t_a be the ambient temperature outside of the pyrophyllite, essentially the temperature of the anvils (taken to be the temperature to which the thermocouple immediately drops just when the power is shut off after detection of a melting point) then the heat flow (at equilibrium) from the sample out to the position of the thermocouple will be proportional to $(t-t_m)$:
>
> $$H_1 = K_1 (t-t_m),$$
>
> and the heat flow from the position of the thermocouple out to the anvils will be proportional (as a first approximation) to (t_m-t_a):
>
> $$H_2 = K_2 (t_m - t_a).$$
>
> Now if an equilibrium condition exists, these two values of heat flow must be equal in magnitude, or
>
> $$K_1 (t-t_m) = K_2 (t_m - t_a),$$
>
> from which
>
> $$t = t_m + (K_2/K_1)(t_m - t_a)$$
>
> Denoting the constant K_2/K_1 as k, the heat correction equation is obtained.[4]
>
> $$t = t_m + k(t_m - t_a)$$

The constant k is determined by correcting the extrapolated experimental