as follows:

$$H_c(P,T)=H_0(P)+A_1(P)T^2+A_2(P)^4+\cdots. \quad (6)$$

Since the terms of higher power than T^2 become negligible as T approaches 0°K, evaluation of (6) yields $\gamma^*=(H_0A_1)/2\pi$.[14] Both H_0 and A_1 are sensitive to

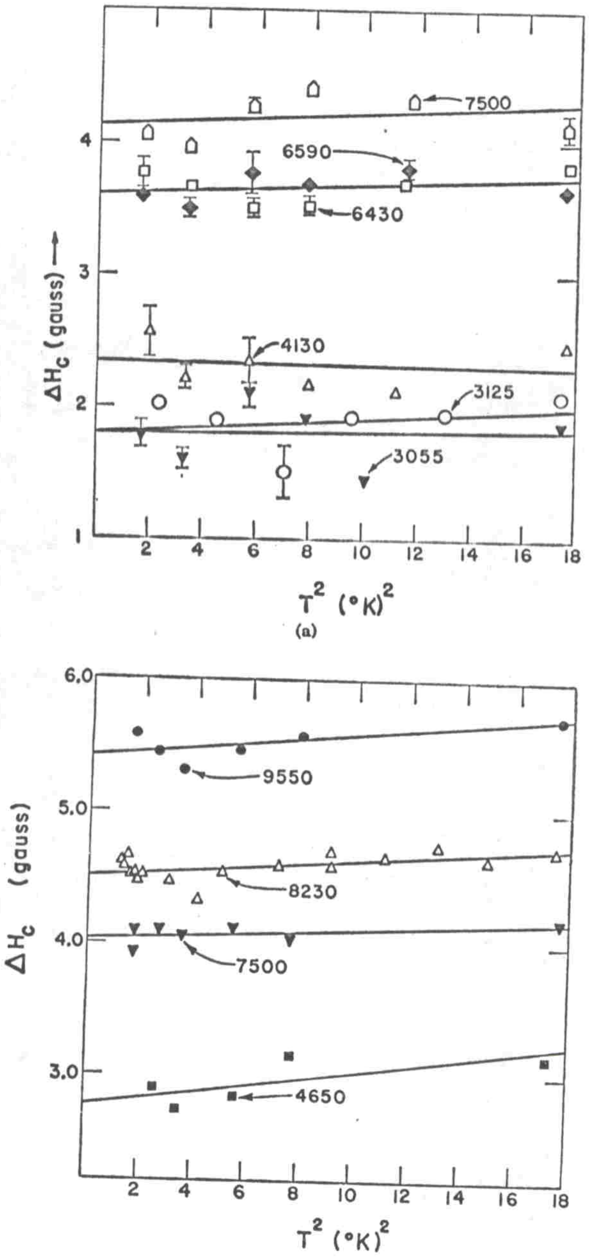

FIG. 4. Temperature variation of isobaric pressure shift for different pressures. Numbers identifying coded symbols give the pressure of measurement in pounds per square inch. (a) Run No. 1, six isobars at pressures from 3055 to 7500 psi. (b) Runs 2 and 3, four isobars at pressures from 4650 to 9550 psi.

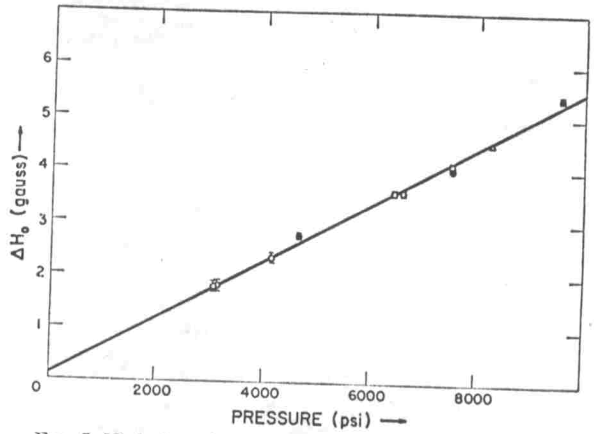

FIG. 5. Variation of the critical field intercept, H_0, with pressure. ○—Run 1; ●—Run 2; △—Run 3.

pressure so that

$$(1/\gamma^*)(d\gamma^*/dP)=(1/H_0)(dH_0/dP) +(1/A_1)(dA_1/dP). \quad (7)$$

Determination of (dA_1/dP) should, in principle, be done by measuring the limiting slope of a plot of H_c vs T^2 at the lowest temperature. Unfortunately, the experimental scatter, as well as the scarcity of points at the lowest temperatures of measurement, makes such an analysis unreliable in the present case. Instead, the following approximate method was used.

From (6) it follows that ΔH_c may be written as

$$\Delta H_c=H_c(0,P)-H_c(P,T) =\Delta H_0+\Delta A_1T^2+\Delta A_1T^2+\Delta A_2T^4\cdots. \quad (8)$$

In the temperature range below 4.2°K ($t=0.585$), the contribution of terms involving T to a higher power than T^2 is small and decreases rapidly as T decreases. Accordingly, an approximately linear variation of ΔH_c with T^2 is expected, with a slope about equal to $\Delta A_1(P)$. The data of Fig. 4 were analysed by least squares to obtain the slope, which was interpreted as ΔA_1. Adding the estimated ΔA_1 values to the value of $A_1(P=0)$ from previous work,[12] and plotting against pressure gives the results shown in Fig. 6. While the scatter of the points in Fig. 6 is considerable, a perceptible decrease in A_1 with increasing pressure seems to be present. From the slope of Fig. 6 the following value is obtained

$$(dA_1/dP)=-(1.39\pm1.17)\times10^{-6}\ \text{gauss/psi deg}^2.$$

Using previously reported values of H_0 and A_1,[12] Eq. (7) may be evaluated with the result that

$$(1/\gamma^*)(d\gamma^*/dP)=-(5.65\pm1.05)\times10^{-7}\ (\text{psi})^{-1} =-(8.31\pm1.54)\times10^{-6}\ (\text{atm})^{-1}.$$

As might be expected, there seems little doubt that

[14] It should be expressly noted that the validity of this analysis requires that data at sufficiently low temperatures be available to define a value of A_1 which does not vary with the lowest measuring temperature. For most superconductors this necessitates measurements below 1°K, but because of the relatively high T_c of Pb, it appears that the limiting value of A_1 can be obtained with reasonable reliability from measurements no lower than 1.2°K.