pends on the electron scattering. From the Hall effect we determine the electron density n, and then the effective mass is determined from the value of the thermal emf α_∞ in the saturation region.

The measurements were made at temperature gradients 3 - 6 deg/cm; the difference in the temperature drops on opposite faces of the sample did not exceed 2%. The termocouples were introduced in the high-pressure chamber without a break of the continuity. The pressures were produced at nitrogen temperatures by a method proposed by Itskevich [1]. The investigated samples measured 10 x 3 x 2 mm.

In the absence of degeneracy and at low value of the non-parabolicity parameter $\gamma = kT/\epsilon_g$, the thermal emf in the saturation region equals, accurate to terms $\sim\gamma^2$,

$$\alpha_\infty = \frac{k}{e}\left(\frac{5}{2} + \frac{15}{2}b\gamma - \frac{45}{4}a\gamma^2 - \mu_0^*\right), \qquad (2)$$

where $\mu_0^* = -\ln\,[2(2\pi m_n kT)^{3/2}/nh^3]$, and a and b are some simple functions of ϵ_g and Δ (see [2]).

Figure 1 shows a plot of α_∞ against P for two samples of n-InSb with $n \simeq 2.2 \times 10^{14}$ cm^{-3}, and Fig. 2 shows a plot of n vs. P. The pressure dependence of the effective mass m_n, calculated in accordance with (2), is shown in Fig. 3 for samples with $n \simeq 2.2 \times 10^{14}$ (•) and $n = 4.7 \times 10^{13}$ cm^{-3} (+). The same figure shows a theoretical plot of $m_n(P)$ calculated from (1) (dashed curve). In the calculations we assumed that $\epsilon_g(96°K) = 0.226$ eV, $\Delta = 0.9$ eV, and $\epsilon_p = 23$ eV. With increasing pressure, the disparity between the experimental and theoretical curves increases and appreciably exceeds the experimental errors. Two possible causes of this disparity have been considered: (i) change of matrix element $\mathcal{P}^2$ with pressure, (ii) change of perturbation of the mass m_n by the remote bands with changing pressure.

To reconcile the experimental and theoretical values of m_n it must be assumed that $\mathcal{P}^2$ increases by 20% at P = 5 katm and by 35% at 16.5 katm. If we recognize that at 16.5 katm the lattice constant increases by ≈1.5%, then admittedly such large changes in $\mathcal{P}^2$ are unlikely.

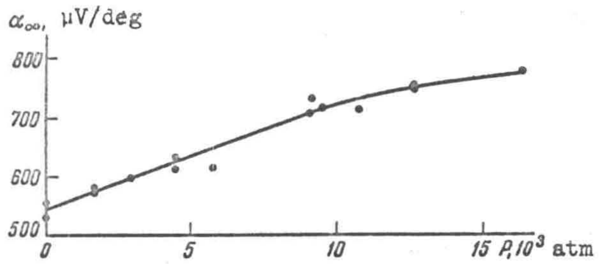

Fig.1

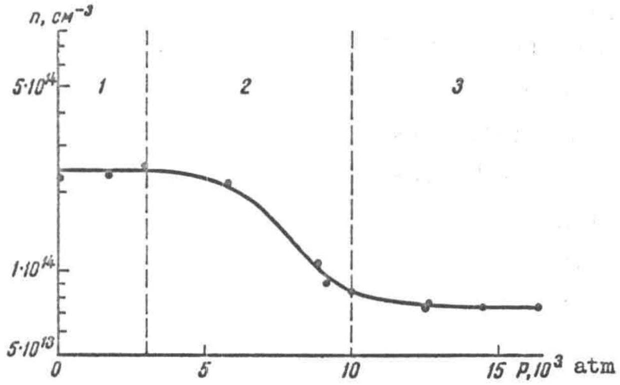

Fig. 2

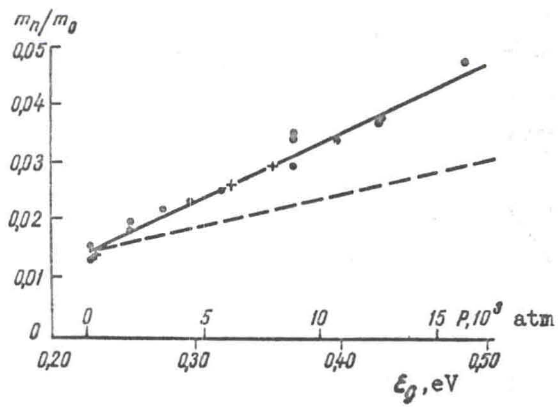

Fig. 3