ferent sections of the analyzer memory.

The figure shows certain results of the performed measurements, in the form of plots of A vs. E_k for different m_1/m_2 intervals (a), and in the form of the entire aggregate of the realized fission methods (b). Both groups of data, differential and integral, exhibit approximately a similar tendency for the variation of the anisotropy with E_k. It is in satisfactory agreement, in the main, with Hoffman's prediction [3] in the greater part of the variation region $E_k > 155$ MeV. The results of measurements of A with constant E_k and different values of m_1/m_2 show a certain growth of A with increasing m_1/m_2. We note that the integral data on $A(m_1/m_2)$ (for the entire aggregate of realized E_k) agree on the whole with the results of [2].

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CONCERNING THE SUPERCONDUCTIVITY OF THE ALLOYS OF THE SYSTEM Nb_3Al - Nb_3Ge *

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We have already reported [1] that an investigation of alloys of the niobium-aluminum-germanium-tin system revealed the presence of a β phase with the β-W structure and constituting an Nb_3-Al-Nb_3Sn-Nb_3Ge solid solution.

An investigation of the dependence of the critical superconducting transition temperature T_c on the composition in the pseudobinary sections Nb_3Al-Nb_3Sn and Nb_3Al-Nb_3Ge has shown a smooth decrease of T_c from one compound to the other. However, for the Nb_3Al-Nb_3Ge alloys the dependence of T_c on the composition had a maximum close to 20% Nb_3Ge. The alloys were prepared by crucible-less melting in the suspended state. The alloys were poured in a copper mold and annealed at 600° for 250 hours, after which they were quenched in water. Since we were interested in checking on the possibility of further increasing the observed maximum of the critical temperature, we undertook investigations of the alloys of the system Nb_3Al-Nb_3Ge at compositions close to the maximum of T_c. To this end we prepared the alloys by sintering the powdered metals in a quartz ampoule placed in a high-frequency furnace at 2000°C in an atmosphere of pure helium drawn through the ampoule. The pressed sample was suspended by a niobium wire in such a way that it hung freely in the ampoule during the sintering time, without touching its walls. The magnetic moment of the sample was measured immediately after the sintering and after the heat treatment. To anneal the sintered sample, it was suspended in another quartz ampoule, which was filled with pure argon and sealed, and then placed in an oven, kept 100 hours at 900°, and quenched in water at 0°C. AC bridge measurements of the magnetic moments and of the transition curve, based on the change of the inductance of a measuring coil, have shown that the critical temperature of the sample increases appreciably after heat treatment. Such a sample exhibited an appreciable magnetic moment even at a temperature 19°K, although the steep part of the transition curve was situated at a somewhat lower temperature. The value obtained for T_c by extrapolating the $M_{max}(T)$ plot for the given sample was 19.1°K (M_{max} = maximum value of M on the plot of $(M)_{T=const} = f(H)$). Figure 1 shows the dependence of the magnetic moment on the field for one of the heat-treated samples. Figure 2 shows the transition curves, determined from the change of the mutual induction for one of the samples before and after homogenization.

A recent communication [2] reports the results of an investigation of the specific heat and the magnetic moments of the same alloy; the authors were able to raise its critical temperature to 20.05° by using rapid cooling (quenching) of the samples. It can be assumed, as is done by the authors of [2], that the increase of T_c is caused by the fact that the phase responsible for the high value of T_c approaches the stoichiometric composition and the ordering in the alloy is increased by the rapid cooling. A similar rise in T_c occurs in several other alloys, for example

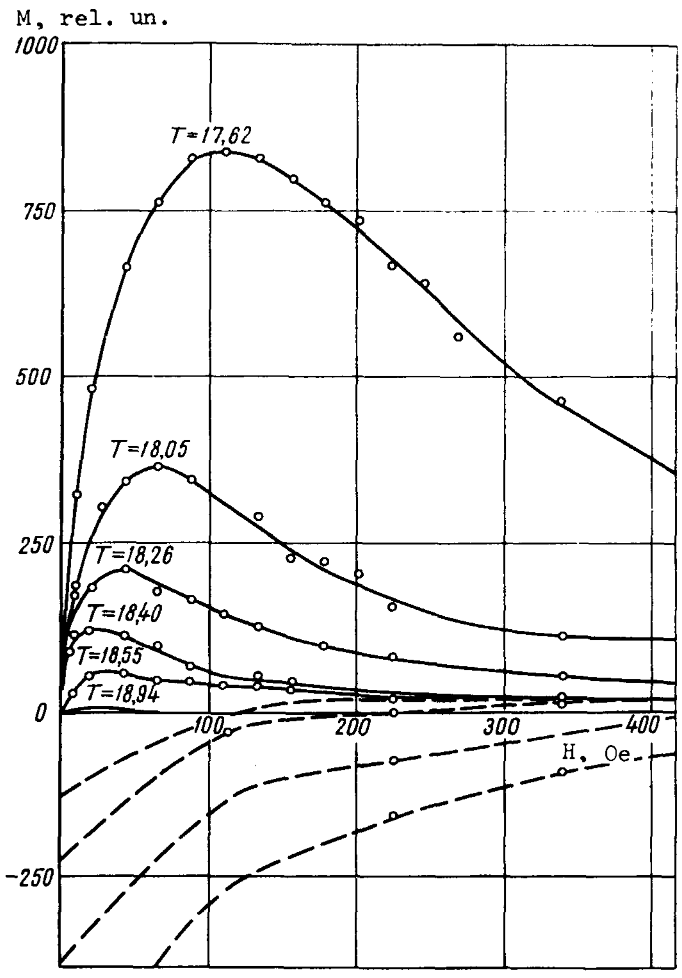

Fig. 1. Magnetic moment M (relative units) vs. magnetic field H (in Oe) for a heat-treated $(Nb_3Al)_4Nb_3Ge$ sample (the solid and dashed curves correspond to increasing and decreasing field, respectively).

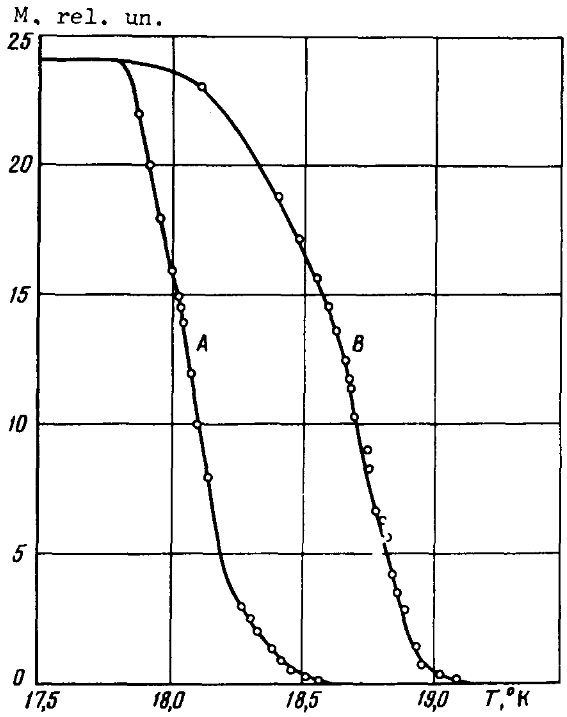

Fig. 2. Superconducting transition curves plotted with AC bridge; A - sample not heat treated, B - after heat treatment.

in the niobium-nitrogen-carbon system. The specific peculiarities of the phase with β-W lattice, whose composition in the niobium-germanium system is shifted under ordinary conditions towards niobium and corresponds approximately to $Nb_{3.3}Ge$, make such an assumption plausible. In the compound Nb_3Ge itself, quenching also increases the temperature at which the resistance begins to decrease, but, just as in the alloy investigated here, its resistivity, which begins to drop at 17°K, does not vanish even at 6°K [3]. However, we cannot exclude at present other causes of the increase in T_c, for example the influence of uncontrollable impurities entering into the alloy during the prolonged annealing. These impurities can be oxygen and nitrogen, and also silicon from the ampoule walls [4]. The authors of [2] report that the electronic specific heat of the alloy investigated by them, i.e., the coefficient γ of the linear term, is at least half as large as γ of the Nb_3Sn and V_3Si. They therefore conclude that their results do not agree with the modern microscopic theory of superconductivity, which calls for an increase in T_c with increasing electron state density N(0). However, they did not report in [2] the phase composition of the samples, so that the low values of γ may be average values taken over the entire sample, and the value of γ of the phase responsible for the high T_c may be larger than the average. In addition, when the state density is large, the simple expression relating γ with N(0) is no longer valid. It is probable that further investigations are needed to confirm the statement made in [2]. Raising the critical superconductivity temperature by two degrees is of undoubted interest, not only from the purely scientific point of view.

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THE MASS OF THE GRAVITON

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If the gravitational field is the field of the space-time curvature tensor, then the Ricci tensor R_k^i in a real field is connected with the matter tensor in a nonlocal manner [1] and (in contradiction to Einstein's equations) does not vanish outside the field sources. Consequently, there should exist in nature anomalous gravitational waves that carry the tensor R_k^i. If the anomalous gravitons have a rest mass $\mu \neq 0$, then the equations of weak anomalous waves in vacuum should be of the form $\Box f - \mu^2 f = 0$, where f is the component of the curvature tensor and $\Box$ the d'Alambert operator in flat 4-space. Let us see to what extent $\mu \neq 0$ is compatible with the metric equations of gravitation.

We assume that the equations of gravitation correspond to the principle of least action. Consequently [2]