Finally, some contribution to the process of recovery is made by stress relaxation by the additional development of existing inclusions of the low-temperature phase. As the metallographic studies show, at 77°K, in creep, bands arise in which the f.c.c. phase is concentrated, and these develop rapidly as an after-effect of stress relaxation at the apex of the wedge-shaped band. This is quite obvious if one compares Figs. 6a and 6b, where the elongations of martensite bands (indicated by arrows) occurred after 6 hr creep at 0.65 kg/mm² in the steady stage.

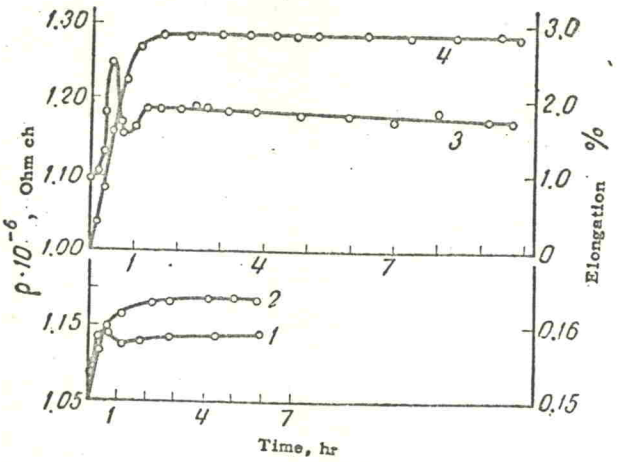


FIG. 7. Creep curves of lithium specimens at 77°K (2 and 4) and variation in electrical resistivity during creep (1 and 3) under different stresses:

1 and 2 — $\sigma_0$ = 0.2 kg/mm² 3 and 4 — $\sigma_0$ = 1.2 kg/mm²

4. *Resistivity of lithium specimens.* At the same time as the creep curves were taken at 77°K the resistivity of the original specimens was measured, and of those which had been deformed at liquid nitrogen temperature.

There is a big difference in the time dependence of the resistivity of these two batches. For the original specimens, which had undergone the low-temperature transition in the process of creep, the resistivity showed a time variation as follows (Fig. 7). The beginning jump and the beginning of the transition stage of creep corresponded to an increase in the volume resistivity and the point where a maximum was reached followed by a drop and rise up to a certain level, which remains unchanged at the transitory and steady-state stages of creep. The height and position of this jump in relation to the different stages on the creep curve depend on the initial stress. As the stress rises so does the maximum, and then gradually shifts towards the initial stage of unsteady creep; there is a very distinct second rise in resistivity close to the transition point to the steady-state stage of flow.

In all cases, after transition to the steady state of creep the resistivity was higher than in the initial state. But the size of the increment also depends on the creep stress and increases parallel to it. Typical creep curves ($\sigma_0$ = 1.5 and 1.8 kg/mm²) and resistivity curves are shown in Fig. 8 for specimens after prior