formation by 35 per cent at 77°K.

The time dependence of the resistivity of pre-deformed specimens shows a continuous drop in ρ. The maximum rate of the drop is found in the initial section of the unsteady stage. At this stage the size of the drop is 4 per cent. It is interesting that there is a continuous drop in ρ even in the process of creep at high stress in the accelerated stage just prior to failure.

The difference in the form of the dependence of resistivity on the pre-history of the specimen is the result of the difference in the initial structure. The rise in the resistivity of originally annealed specimens is due both to the process of plastic deformation (mainly at low stresses), and to the polymorphous b.c.c.-f.c.c. transition which takes place in the initial stage of flow, with martensitic kinetics [12]. The role of the latter in increasing ρ increases with the creep stress.

The different course of the resistivity in the two batches of specimens is due to the fact that the deformed specimen is already strengthened, and the original one is being strengthened in the process of creep. Since the phenomenon of recovery may be observed as a result of the strengthening which in the one case takes place before creep and in the other during it, it will begin at different stages of creep in the two different batches. In the original specimens therefore, the processes of strengthening and recovery should be parallel and lead to the formation of a maximum on the curve for the time dependence of resistivity.
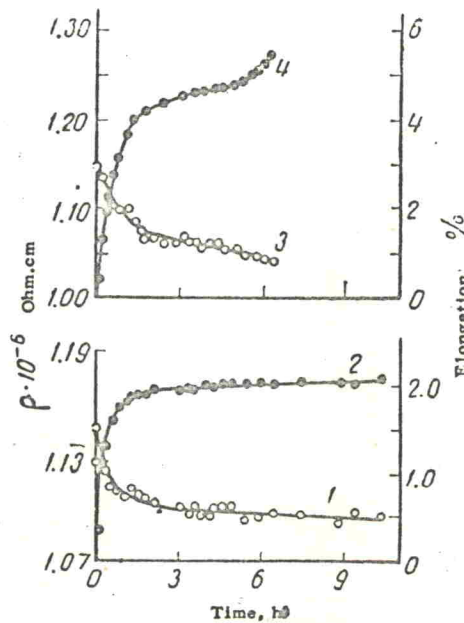

FIG. 8. Creep curves (2 and 4) and variation in electrical resistivity (1 and 3) of lithium in the process of creep at 77°K, for specimens predeformed to 35 per cent at 77°K: 1 and 2 — $\sigma_0 = 1.5$ kg/mm^2 3 and 4 — $\sigma_0 = 1.8$ kg/mm^2

The shift of the ρ peak to the left as σ_0 rises (Fig. 7) is due to the fact that recovery begins early and is more vigorous at higher stresses. Due to the work hardening in specimens which have been deformed at 77°K, recovery begins at the very beginnings of the process of creep and continues right up to the steady stage of flow.