eliminates the discrepancy between the theoretical estimates given in Ref. 5 and the results of our investigations.

In conclusion, the authors express their gratitude to V. M. Seleznev, V. V. Krugovykh, I. F. Maklakova and other co-workers.

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On a Certain Regularity of Decaying Unstable Particles

P. S. Isaev and V. S. Murzin

Electrophysics Laboratory, Academy of Sciences, USSR
Moscow State University

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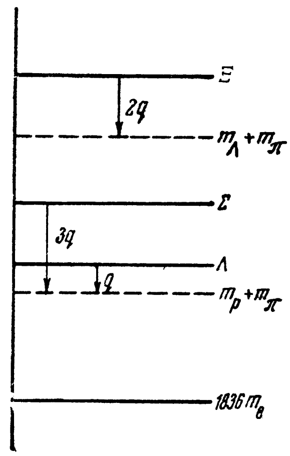
At the present time the following values of the masses of stable and unstable particles have been firmly established as universal (in electron masses): $m_\nu = m_\gamma = 0$; $m_e = 1$; $m_\mu = 207$; $m_\pi = 274$; $m_K = 966 \pm 3$; $m_p = 1836$; $m_\Lambda = 2181 \pm 1$; $m_\Sigma = 2327 \pm 3$; $m_\Xi = 2585 \pm 15$.

From among these particles, μ, π, K, Λ, Σ and Ξ are unstable. The values of the decay energy Q, experimentally observed or computed from the known masses of the particles and from decay schemes, are given below (in mev):

$\pi^0 \to 2\gamma$	$Q = 135$	$n = 3.8$
$\mu \to e + 2\nu$	$Q = 106$	$n = 3.0$
$\pi \to \mu + \nu$	$Q = 34.5$	$n = 1.0$
$K \to 3\pi$	$Q = 75.0 \pm 1.5$	$n = 2.1$
$K \to 2\pi$	$Q = 214 \pm 5$	$n = 6.0$
$K \to \mu + \nu$	$Q \sim 389$	$n = 11.0$
$K \to \mu + \pi^0 + \nu$	$Q \sim 248$	$n = 7.0$
$\Lambda^0 \to p + \pi^-$	$Q = 37.0 \pm 1.0$	$n = 1.0$
$\Sigma \to n + \pi$	$Q = 111.0 \pm 3$	$n = 3.1$
$\Xi \to \Lambda^0 + \pi$	$Q = 66 \pm 6$	$n = 1.9$

The third column contains the quantity $m = Q/q$, where $q = 35.5$ mev $= 69.5\ m_e$. All values of n are quite close to integers. An exception is noted only in several cases, when the decay leads only to stable particles (for example, neutron or π^0).

The kinetic energy liberated in the decay of unstable particles is thus a multiple of 35.5 mev. The experimentally observed energy-level scheme for hyperons* is shown in the diagram.



If the above statements are correct and if new unstable particles exist, they should be located among the mass numbers M satisfying the relationship

$$M - (m_p + nm_\pi) = n_1 q$$

for particles heavier than protons, or the relationship

$$M - nm_\pi = n_1 q$$

for mesons heavier than the pion. In these equations n and n_1 are integers.

It is interesting to note that the number of electron masses entering into q is very close to the value $1/2\,\alpha = 68.5$.

* Incidentally, several possible hyperon models exist, but there is no point in dwelling on them in this note.

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Peculiarities of the Temperature Dependence of the Electrical Resistance of Ferromagnetic Metals at Low Temperatures

A. I. SUDOVTSOV AND E. E. SEMENENKO

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FROM general considerations it follows that for ferromagnetic metals we can expect the appearance of a peculiarity in the temperature dependence of the electrical resistance at low temperatures, brought about by the collisions of the conduction electrons withthe carriers of ferromagnetism. In order to make clear this peculiarity, measurements were carried out on polycrystalline samples of iron, nickel and platinum in the temperature interval from 4.2° to 1.23° K. Platinum was chosen for comparison of the ferromagnetic metals with a metal of the transition group that was nonferromagnetic.

The iron and nickel used in the investigation were from Hilger and were the purest at our disposal. From these we prepared specimens in the form of thin ribbons. The residual resistance of the iron specimen amounted to $R_{4.2°K}/R_{0°C} = 3.9328 \times 10^{-2}$, where $R_{0°C} = 0.5091$ ohm, and of the nickel, $R_{4.2°K} / R_{0°C} = 1.0148 \times 10^{-2}$, where $R_{0°C} = 0.8407$ ohm. The specimen of platinum was a resistance thermometer with residual resistance $R_{4.2°K} / R_{0°C} = 3.6805 \times 10^{-3}$ and $R_{0°C} = 59.79487$ ohms.

The measurements on platinum showed that the curve of the temperature dependence of the resistance of the platinum was accurately described by the expression

$$R_T / R_{0°C} = (R_{0°K} / R_{0°C}) + BT^2,$$

where

$$B \approx 1.8 \cdot 10^{-6}, \quad R_{0°K} / R_{0°C} = 3.6486 \cdot 10^{-3}.$$

The results of measurement on the iron and nickel are shown on the graphs of Fig. 1 and Fig. 2, where the magnitude of the relative resistance $R_T / R_{0°C}$ is plotted along the ordinate and the temperature in degrees Kelvin is plotted along the abscissa. The different symbols for the points correspond to different series of measurements on one and the same sample.

For iron, the resistance curve (Fig. 1) cannot be described simply by a quadratic function, as is the case for platinum. Its behavior is accurately expressed by a binomial in T^2 and an additional linear term:

$$R_T / R_{0°C} = (R_{0°K} / R_{0°C}) + AT + BT^2.$$

where $A = (4 \text{ to } 4.9) \times 10^{-6}$, $B = (1 \text{ to } 1.2) \times 10^{-6}$; $R_{0°K} / R_{0°C} = 3.9293 \times 10^{-2}$.

The temperature dependence of the resistance for nickel is plotted in Fig. 2 on the same coordinates which were used to describe iron. We obtain the formula

$$R_T/R_{0°C} = (R_{0°K}/R_{0°C}) + AT + BT^2,$$

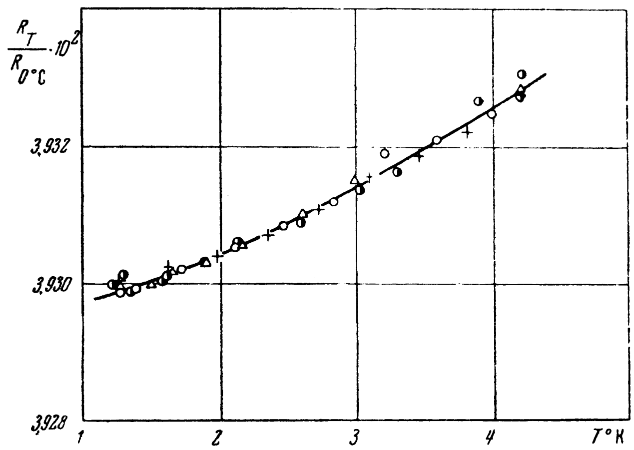

FIG. 1

in which $A = (0.8 \text{ to } 2.2) \times 10^{-6}$; $B \approx 2.7 \times 10^{-6}$; $R_{0°K} / R_{0°C} = 1.0086 \times 10^{-2}$.

For nickel, the linear component is smaller in magnitude and is determined less acuurately. Here it is necessary to separate a small value against a background of the much stronger quadratic dependence of the resistance. More accurate data on the values of the linear components of the electrical resistance in iron and nickel can be obtained with measurements on single crystals and at temperatures below 1° K.

In this fashion a peculiarity is observed in the temperature dependence of the electrical resistance