intensity during the culmination of the nova for a single day to the mean value of the daily intensity in no case exceeded twice the error of measurement.

This confirms our previous experience with Nova Herculis, as in neither case could an influence of undeflected cosmic rays originating in the nova be detected.

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Resonance Levels for Absorption of Neutrons

WHEN a very thin layer of boron is irradiated with slow neutrons, the number of α-particles emitted can be represented by an expression proportional to $\Sigma n^i \alpha^i + P$, where the terms $n^i \alpha^i$ correspond to the nearly homogeneous groups of neutrons absorbed selectively in certain elements; n^i is the number of neutrons having kinetic energy E^i, and α^i is their coefficient of absorption in boron. The most important term represents the group of 'thermal' neutrons, called by Amaldi and Fermi[1] the group C. If we absorb this group in a thin sheet of cadmium, the number of α-particles emitted by boron diminishes by an amount proportional to $a^C n^C \alpha^C$, where a^C is the fraction of the group C absorbed by cadmium. Similarly, let us suppose that we absorb another group, J, in a suitable element; the corresponding decrease of the number of α-particles will be proportional to $a^J n^J \alpha^J$. If, therefore, the relative numbers of groups C and J and the fractions a are known, we can determine the ratio α^C/α^J, which is equal to $\sqrt{E^J/E^C}$. In this way the energy corresponding to the resonance level of the element J can be calculated.

I have used a boron-coated ionization chamber connected to a Hoffmann electrometer. The chamber was surrounded with paraffin wax and irradiated with slow neutrons from a source of polonium and beryllium equivalent in strength to 10 mgm. of radium. The ionization currents were measured (1) with unfiltered radiation; (2) with neutrons filtered through 0·5 mm. of cadmium; and (3) 0·5 mm. of cadmium and 0·1 mm. of silver. The results are as follows:

Filter	none	0.5mm.Cd	0·5mm.Cd+0·1mm.Ag
Ionization	4·0465	0·3285	0·3145

Owing to the smallness of the effect due to absorption of neutrons in silver, a very great number of measurements has been made so that the statistical errors were about ten times smaller than the differences to be measured. We have

$$\frac{a^A n^A \alpha^A}{a^C n^C \alpha^C} = \frac{0\cdot 014}{3\cdot 718} = 0\cdot 00376.$$

The relative numbers of groups A and C and their coefficients of absorption in cadmium and in silver have been determined by Fermi and Amaldi. As it was, however, to be expected that the numbers may depend on the geometrical arrangement, thickness of paraffin, etc., special experiments have been made in order to compare directly $a^A n^A$ and $a^C n^C$ The boron layer has been removed, and a silver foil of 0·05 thickness exposed in its place, all other conditions remaining unchanged. The activity of the foil, due to the isotope of 22 sec. period, was measured by means of a Geiger counter. If a is the activity obtained with unfiltered radiation, b that with neutrons filtered through 0·5 mm. of cadmium, and c that with neutrons filtered through 0·5 mm. of cadmium and 0·1 mm. of silver, then

$$a = 1490, \quad b = 1134, \quad c = 344.$$

If r^A and r^C are the fractions of the total number of neutrons absorbed in the silver foil, we have

$$\frac{a^A n^A r^A}{a^C n^C r^C} = \frac{1134 - 344}{1490 - 1134} = \frac{790}{356} = 2\cdot 2.$$

The fraction r^A/r^C can be calculated using the known values of absorption coefficients of silver for the groups A and C. I find

$$r^A/r^C = 53\cdot 6, \text{ and hence } a^A n^A / a^C n^C = 0\cdot 041.$$

According to Amaldi and Fermi, $n^A/n^C = 0\cdot 016$. Considering that $a^A/a^C < 1$, we see that under the conditions of my experiment, group A appears to be very prominent. This may be due to the special arrangement used, or to the fact that the brass walls of the ionization chamber absorbed a considerable fraction of thermal neutrons. For the ratio of the coefficients of absorption in boron, I find finally

$$\alpha^C/\alpha^A = 0\cdot 041/0\cdot 00376 = 10\cdot 9\,;$$

and for the energy ratio

$$E^A/E^C = 117\,; \; E \simeq 3 \text{ e.v.},$$

in good agreement with determinations of Preiswerk and Halban[2].

Similar experiments performed with gold have given $E^{\text{Au}} \simeq 4\cdot 5$ e.v. In the case of iodine, using as absorber a sheet of potassium iodide of 1 gm./cm.^{2}, I could not find any diminution of the ionization current. This shows, in agreement with the determinations of other workers, that the resonance level of iodine is essentially higher than that of silver and gold. It should be noticed that Collie[3] has applied a similar method, but obtained definite results only in the case of indium.

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Destruction of Supraconductivity by Electric Current and Magnetic Field

BY any change of the magnetic flux through a supraconducting ring a permanent current T is induced, the strength of which can be calculated from the field intensity in the centre of the ring, taking into account the field deformation caused by the magnetic properties of the supraconducting ring.

In Fig. 1, T is plotted against the external field intensity H_s for a ring of tin. This curve, which limits the region of supraconductivity ($\rho = 0$), is given by the condition that the sum of the tangential component of the external field and the field caused by the current is equal to the critical magnetic field, either on the inside or on the outside periphery of