and the chamber, neutrons were observed as long as $1\frac{1}{2}$ minutes after the bombardment of the uranium, the initial intensity being about one neutron per second. The decay period of these neutrons was observed to be 12.5 ± 3 sec.

Since delayed neutron emission could be due to photodisintegration by gamma-rays we looked for and found a hard gamma-ray of approximately the same period. If these gamma-rays are the cause of the neutron emission, separate intensity tests showed that they must be at least 1000 times as effective as the lithium or fluorine gamma-rays produced by proton bombardment. No neutrons were observed with the same arrangement during proton bombardment of lithium or fluorine targets, although several photoneutrons per second were observed from a few grams of heavy water.

The period of the neutrons and gamma-rays is close to one of the beta-ray periods observed by Meitner, Hahn, and Strassmann.[1] It is possible that the gamma-ray emission follows the 10-sec. beta-ray emission observed by them, and causes or is accompanied by the emission of neutrons.

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Presence of the Nitrogen Forbidden Line $^2P\rightarrow{}^4S$ in the Auroral Spectrum

I have recently reported the probable presence of the N I line $^2P\rightarrow{}^4S$ in the spectrum of diffuse aurorae.[1] A preliminary study of my plates had caused me to ascribe to this radiation a wave-length near 3470A, deduced from the approximate dispersion curve given by the N_2 bands of the second positive system. However, I had also at my disposal a plate with a comparison spectrum from a small luminescence lamp containing a mixture of neon and argon. The identification of all the lines appearing on the plate enabled me to make sure that the auroral radiation practically coincides with the neon line $\lambda=3{,}466{,}575$A, and also that, in the proper spectral region, my spectrograph is capable of distinguishing clearly lines only 3A apart. Under these conditions, I can affirm that the true wavelength of the line attributed to N I is: $\lambda=3466.5\pm1$A.

This value is in good accordance with the theoretical wave-length $\lambda=3466.6$A deduced from the ionization potential of N I (14.48 v, or 117,375 cm^{-1}, according to Hopfield). Besides, using Edlên's still unpublished results concerning the excitation potentials of the N I levels, M. Nicolet[2] computes the value $\lambda=3466.5$A. On the other hand, J. Kaplan[3] now finds, for the line observed by him in the laboratory, the corrected wave-length $\lambda=3466.3$A, with an approximation of a few tenths of an angstrom. Thus, the best measurements of the lines found, near 3466A, in the afterglow and aurora spectra, indicate that their identity is highly probable, as well as the presence of ^2P nitrogen neutral atoms in the upper atmosphere.

According to B. Stepanoff,[4] the splitting of the ^2P level of N I would be nearly 2.15 cm^{-1}. It corresponds to a difference of one-fourth of an angstrom between the components of the line $^2P\rightarrow{}^4S$. Such a structure will be shown only by the interference method.

No night-sky radiation can be actually identified with the N I line $\lambda=3466.5$A, unless by assuming an error of 4 to 5A in the measurement of the strong sky line found at $\lambda=3471$A.

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The Fission of Uranium*

This letter is a preliminary report of some of the experiments which we have undertaken on the fission process of the uranium nucleus by neutron bombardment.

The phenomenon was discovered by Hahn and Strassmann[1] who were led by chemical evidence to suspect the possibility of the splitting of the uranium nucleus into two approximately equal parts. Through the kindness of Professor Bohr we were informed of these results some days before receiving them in published form, as well as of the suggestion of Meitner and Frisch that the process should be connected with the release of energy of the order of 200 Mev.

It seemed worth while to attempt the detection of the fragments by their high ionization. The interior of a parallel plate ionization chamber was coated with a thin layer of uranium oxide. When this chamber was connected to a linear amplifier a large number of small pulses from the alpha-particles of uranium were observed, but when exposed to the bombardment of neutrons from the cyclotron or from a Rn-Be source very large pulses occurred in addition. From the ratio of the maxima of these large pulses to the maxima of those due to the alpha-particles it was estimated that the energies of the fragments of uranium range up to about 90 Mev. This value of the energy seems to be somewhat smaller than the theoretical expectation. If we assume that the energy release in the fission is approximately 200 Mev, and that the two fragments may have somewhat different masses, then fragments with energies up to 120 or 130 Mev might be expected in some cases. However, these values probably do not lie outside our experimental error since lack of linearity in the amplifier and incomplete collection of the ions might explain the difference.

After this experiment had been performed, Professor Bohr received a cable from Dr. Frisch stating that he had obtained the same results some days before.

A number of measurements have been made of the cross section for the fission process for neutrons of different energies. For this the interior of an ionization chamber