production of stars, show clearly that the probability of the emission of many nucleons is significant. Further experiments are in progress with other reactions which it is hoped will clarify the mechanism of nuclear reactions in this energy region.

This work was supported by the Atomic Energy Commission under Contract W-7405-Eng-48 with the University of California.

[1] This deflector system will be described in detail in a forthcoming paper by Dr. Wilson M. Powell.

Erratum: Spectral Location of the Absorption Due to Color Centers in Alkali Halide Crystals

[Phys. Rev. 72, 341 (1947)]

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REFERENCE (6) should read: E. Mollwo, as reported by Pohl in reference (*g*). It now appears as ". . . reference (3)."

In the table, the reference for the value 5700 for the R_2-band of KF should be (*d*). It now appears as (6).

In the table, the reference for the value 7200 for the *F*-band of RbBr should be (*f*). It now appears as (8).

In the heading of the second column of the table, "Inter-Ionic Salt Distance," the word "Salt" should be removed. This word should be the heading of the first column, but its omission is not confusing.

Excitation Curve for the Reaction $C^{12}(p, pn)C^{11}$ up to 140 Mev

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September 22, 1947

THE work of Helmholz, McMillan, and Sewell[1] and Serber[2] has shown that neutrons are stripped off of deuterons when they strike an internal cyclotron target; one naturally expects a similar process in which protons are set free. These protons, having a mean energy half that of the deuterons, will move in circles passing near the center of the cyclotron and with the expected energy spread resolved as in a mass spectrograph. Their distribution is being studied by Chupp, Gardner, and Taylor,[3] and the work reported in this letter shows that their intensity is quite adequate for nuclear experimental work. Stacks of carbon plates enclosed in copper houses, and with suitable defining slits in front, were placed as shown in Fig. 1, the houses being below the level of the circulating deuterons and tilted upward at a proper angle. After exposure to the proton beam, the carbon plates were taken out and their activities (20.5-min. C^{11}) measured on a G-M counter; the plot of the activities against position in the stack gives directly the excitation curve on a range scale.

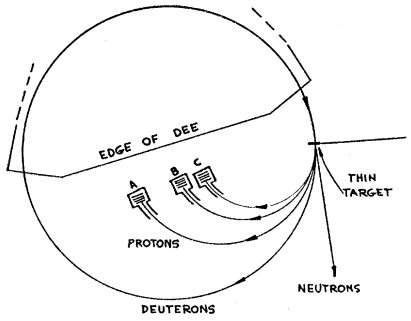

FIG. 1. Schematic diagram of experimental set-up in the 184-in. cyclotron. *A*, *B*, and *C* indicate the three positions of the houses containing the carbon plates. These are below the level of the deuteron orbits.

A series of four runs was made with the plates in position *C*, where the incident proton energy was found to be 65 Mev. The carbon plates were disks $1\frac{11}{16}$-in. diameter by $\frac{1}{32}$ in. thick, with a surface density of 137 mg/cm². In order to establish the end of the range, plates of compressed boric acid having the same stopping power were interposed between some of the carbon plates; the resulting activity formed by $B^{11}(p, n)C^{11}$ with a low threshold gives a fiducial mark from which the range can be found within the resolving power of this experiment (about $\pm\frac{1}{32}$" from the energy spread admitted by the slit system). In Fig. 2, the points corresponding to energies below 65 Mev come from this series. A small neutron background of about 3 percent was subtracted from the carbon activities. Each point is a mean of all the measurements, and the spread found in individual values is of the same order as the irregularities in the curve.

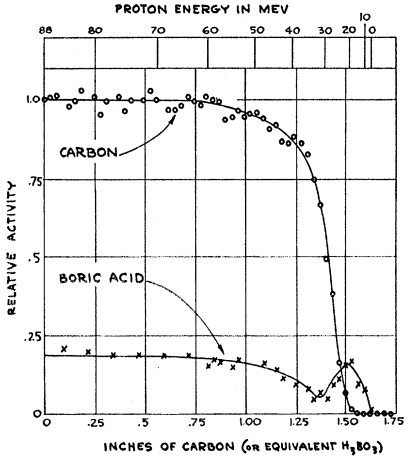

FIG. 2. Excitation curve for the C^{11} activity induced in carbon plates by protons entering at the left. Each point is plotted at a position corresponding to the surface of the plate on which the activity was measured. The lower curve represents the C^{11} activity found in H_3BO_3 plates between some of the carbon plates, and was used to find the end of the range. Points above 65 Mev come from one run and those below 65 Mev from four runs averaged together; these were adjusted in height to fit at 65 Mev. Another run extending the curve to 140 Mev is not included, since it indicates a constant cross section. One inch of carbon corresponds to 4.38 g/cm².