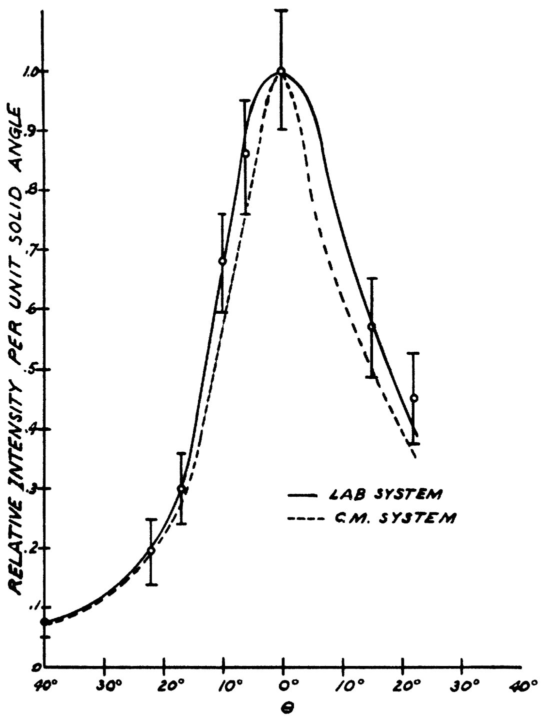

FIG. 2. Angular distribution of neutrons from a $LiBO_2$ target bombarded by 15-Mev deuterons. θ is angle between the direction of maximum neutron intensity and other measured intensities.

To obtain a better understanding of the above described phenomena, experiments are now in progress to improve this data. A four-proportional counter telescope has been built. Better experimental accuracy is expected since the error due to room scattered neutrons is eliminated. Furthermore, it will be possible to measure the neutron spectrum at different angles.

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** AEC Fellow.

[1] Falk, Creutz, and Seitz, Phys. Rev. **74**, 1226 (1948).
[2] J. R. Oppenheimer, Phys. Rev. **47**, 845 (1935).
[3] R. Serber, Phys. Rev. **72**, 1008 (1947).
[4] S. Dancoff, Phys. Rev. **72**, 1017 (1947).
[5] Helmholz, McMillan, and Sewell, Phys. Rev. **72**, 1003 (1947).
[6] R. B. Roberts and P. H. Abelson, Phys. Rev. **72**, 76 (1947).

Proton Stopping Power of Gold

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THE previously reported measurements of the proton stopping power of beryllium[1] have been extended to gold, using the proton resonances F-339 and Al-986 as energy indicators.

A foil thickness of about $\frac{1}{2}$ mg/cm² was chosen for the experiment in order to obtain a shift of the resonance peaks of approximately three times the half-width calculated from the theory of straggling.

The results found are given in Table I for three different foils, each consisting of three layers of commercial gold-leaf (content of copper less than 1 percent). An example of the measurements on the line F-339 is reproduced in Fig. 1. The broadening of the peak is only slightly greater than should be expected because of the straggling, indicating that the foils are only slightly inhomogeneous.

TABLE I. Proton stopping power for three different foils.

Resonance	Total thickness mg/cm²	Shift kev	Mean energy kev	Stopping power kev per mg/cm²
F-339	0.46	39	364	85
F-339	0.52	42	366	81
Al-986	0.46	27	1001	59
Al-986	0.51	30	1002	59
Al-986	0.52	31	1003	60

Wilcox[2] reports a value of 67 kev per mg/cm² for the stopping power of gold at a proton energy of 365 kev. This value is about 20 percent smaller than ours, but in the experiment of Wilcox, the energy shift is only of the same order of magnitude as the

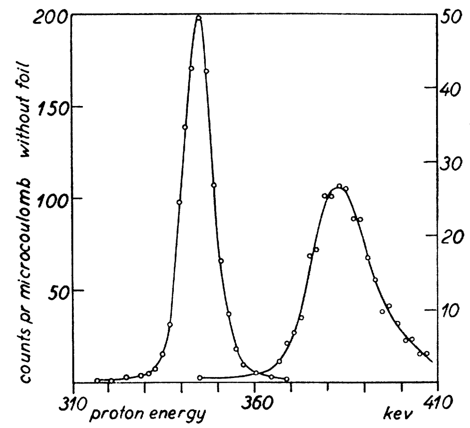

FIG. 1. The F-339 resonance measured without foil and with a 0.46 mg/cm² gold-foil inserted in the proton beam.

half-width, and the results are, for this reason, probably less accurate. The reported difference of 10 percent between the values for protons and deuterons of the same velocity may, therefore, also be expected to be within the experimental uncertainty. This explanation is in agreement with later experiments by Hall and Warshaw.[3]

[1] C. B. Madsen and P. Venkateswarlu, Phys. Rev. **74**, 648 (1948).
[2] H. Wilcox, Phys. Rev. **74**, 1743 (1948).
[3] T. A. Hall and S. D. Warshaw, Phys. Rev. **75**, 891 (1949).

The Density Field in Mach Reflection of Shock Waves

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WHEN two shock waves interact with one another the result is not always a simple crossing of the two waves as would be expected from a linear theory. The nature of the more complicated phenomenon was observed by Mach.[1] Von Neumann[2] has pointed out that the interaction is equivalent to the oblique reflection of a single shock from a rigid wall and he proposed a theory by which the strengths and angles of the other discontinuities could be predicted at the point of intersection from the direction of the incoming flow and the strength of the incident shock. His theory of Mach reflection assumed that the three shocks and a slip stream were the only discontinuities present and that the pressure was constant in each of the three angular domains bounded by the three shocks at least in the neighborhood of the intersection. The experimental results of Smith[3] who determined