has been formerly assumed in counter discharge theory, in which measurable changes of wire potential were assumed to be accompanied by measurable photon emission, is at variance with the present observations. These experiments are, however, in agreement with the discharge mechanism formulated by C. G. Montgomery and D. D. Montgomery. The lags which actually occur are to be expected, and can be accounted for by electron capture in the gas. This phenomena has been reported elsewhere.[2,4]

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[1] C. S. Montgomery and D. D. Montgomery, Phys. Rev. **57**, 1030 (1940).
[2] C. S. Montgomery, W. E. Ramsey, D. B. Cowie and D. D. Montgomery, Phys. Rev. **56**, 635 (1939).
[3] W. E. Ramsey, Phys. Rev. **57**, 1022 (1940).
[4] J. V. Dunworth, Nature **144**, 152 (1939).

The Secondary Peak in the Rossi Curve for Tin

The apparatus, already described[1] comprised primarily five separate horizontal counter areas each containing 18 counters 20 cm long and giving a sensitive area (analyzing tray) 20 cm by 20 cm. The areas were arranged in a vertical array and tin was inserted between the top tray (the first) and the next tray (the second). One-centimeter slabs of lead were placed over trays 3, 4 and 5 for subsidiary reasons. Each counter was connected to an individual electroscope. In addition, above the second tray, but below the tin, there was another counter tray (master tray), without electroscopes. The arrangements were such that the electroscopes were only allowed to operate when at least one ray passed through the whole apparatus including the master tray which, by a side lead shield, guarded against electron showers from the side. The electroscopes recorded photographically the shower history of every *event* associated with the passage of a ray through the whole apparatus.

Figure 1, curve A, shows, plotted against thickness of tin, the number of doubles recorded by the second analyzing tray (below the tin) per 1000 events. It will be observed that the curve shows two maxima, the second one being at 29 cm.

Each point for curve A corresponds in actuality to 1000 observations of events except in the case of the

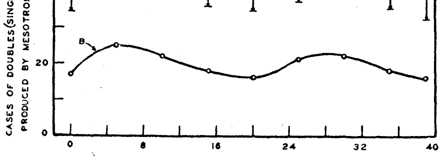

FIG. 1. Number of double coincidences recorded by the analyzing tray (below the tin) as a function of the thickness of the tin.

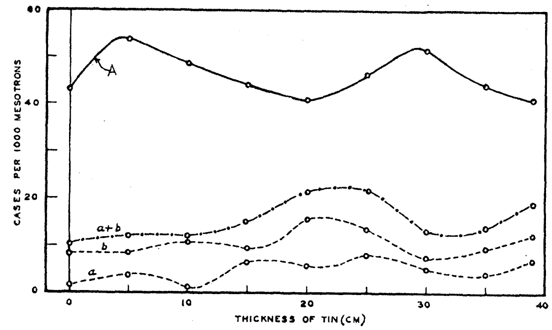

FIG. 2. Curve A, number of double coincidences; curve a, number of quadruple coincidences; curve b, number of triple coincidences at function of the thickness of tin.

points for 20 cm and 30 cm, which correspond to 2000 observations each. The standard deviations are indicated by the vertical lines. At first sight it is surprising that their magnitude permits the degree of regularity exhibited by the curve. The statistics of this matter will be discussed in greater detail in a more complete publication later to be presented. For the present, it will perhaps cement confidence in the reality of the minimum at 20 cm in the case of curve A by replotting, as in Fig. 1, curve B, the results obtained by utilizing, for each point, just half of the observations utilized in drawing curve A. The statistical errors for curve B are, of course, considerably greater, proportionally, than for curve A. However, the minimum is still well marked. It may be added that in order to avoid systematic changes with time, the curve A was not obtained by taking all the observations for the individual points in succession. A smaller number of observations was taken for the whole set of points and repeated backwards and forwards so as to ensure that as far as possible the observations for each point extended over the same period of operation of the apparatus.

It was found that, in 75 percent of the cases, at least one member of each of the two-ray showers disappeared in the lead plate above the third analyzing tray, thus guaranteeing that the shower electrons were in the relatively low energy class.

Figure 2 indicates, in addition to curve A corresponding to Fig. 1, the curve a for quadruple rays, curve b for triple rays, and $a+b$ for the sum of triples and quadruples. In these cases all the curves have been corrected for inefficiency of counter trays, which correction is more important in the case of large showers. Of course, the statistical errors in the large showers are very large, but it is interesting to note that the minimum for doubles is approximately compensated as regards total number of showers by the triples and quadruples.

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[1] W. F. G. Swann, Rev. Mod. Phys. **11**, 242 (1939).