We wish to thank the Mond Nickel Company, which lent the pure osmium powder.

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[1] Bethe, H. A., and Bacher, R. F., *Rev. Mod. Phys.*, **8**, 198 (1936).
[2] Williams, E. J., *Proc. Roy. Soc.*, A, **172**, 194 (1939).
[3] Klemperer, O., "Einführung in die Electronik", p. 272.
[4] Scherrer and Zingg, *Helv. Phys. Acta*, **12**, 283 (1939).

Banded Meson Spectrum and the Rossi Second Maximum

A VERTICAL counter telescope, designed on the basis of Bhabha's method[1], was set up as shown in Fig. 1. 5·25 cm. of lead used in positions II and III together absorb all but the very high-energy electrons. Such high-energy electrons produce showers in the lead in position II and are cut out from being counted by the shower particles tripping the anti-counters 4 or 5 or both. The effect of side showers on this counter telescope is found experimentally to be negligible[2]. The fact that this arrangement measures the hard component only has also been experimentally verified[2].

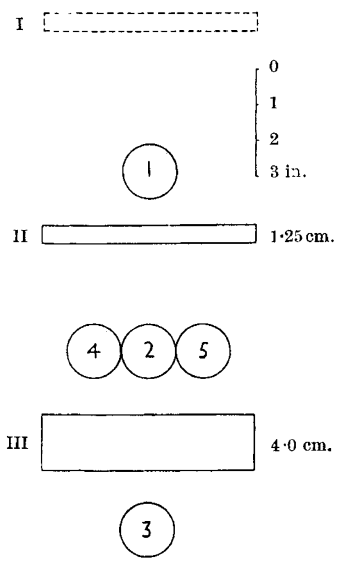

Fig. 1. COUNTERS 1, 2 AND 3 ARE IN COINCIDENCE. COUNTERS 4 AND 5 ARE CONNECTED IN PARALLEL AND IN ANTI-COINCIDENCE WITH COUNTERS 1, 2 AND 3.

The absorption of mesons was measured by placing lead in position I. This is not objectionable, as it is known that penetrating non-ionizing cosmic rays form a negligible portion of the total intensity[3]. The results obtained after taking every possible care to test the counters, circuits, etc., at the end of each measurement are shown in the accompanying table and graphically in Fig. 2.

There is an abrupt drop in the total intensity between the points *A* and *B* on the graph, that is, when the total amount of lead increases from 21·05 to 23·7 cm. This drop is outside the limits of statistical error of the measurements. The slope of the curve before and after the abrupt drop is the same. The drop in intensity, therefore, appears to be real and not spurious. It occurs when the thickness of lead above the counters 4, 2 and 5 lies between 17·05 cm. and 19·7 cm. This is the region in which the well-known Rossi second maximum has been observed by those who get it[4]. Such a drop in the meson absorption curve has not so far been reported by anybody to my knowledge; but its appearance in this experiment is due to the use of the counter arrangement based on Bhabha's method, which is such as to bring out any existing discontinuities. The interpretation of this experiment, together with the results of further experiments now in progress, will be given in a paper with Prof. Bhabha.

Lead in position II = 1·25 cm. Lead in position III = 4·0 cm.

Lead in position I	Counts	Time in hours	Counts/hour
—	7680	81	94·8 ± 0·72
5·2 cm.	4826	52	92·8 ± 0·89
9·3 ,,	6905	76	90·8 ± 0·73
13·7 ,,	5430	61	89·0 ± 0·81
15·8 ,,	3175	36	88·2 ± 1·05
18·45 ,,	4030	48	84·0 ± 0·89
21·45 ,,	2581	31	83·3 ± 1·10
24·45 ,,	3948	48	81·5 ± 0·88

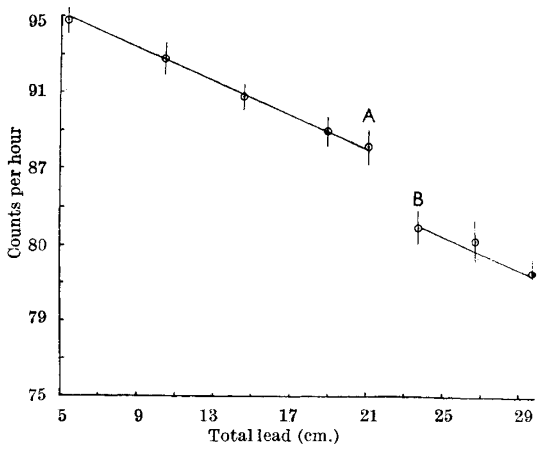

Fig. 2.

I desire to thank Prof. H. J. Bhabha for his interest and encouragement.

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Jan. 31.

[1] Bhabha, *Proc. Ind. Acad. Sci.*, A, **19**, 23 (1944).
[2] In the course of publication.
[3] Jánossy and Rochester, *Proc. Roy. Soc.*, A, **181**, 399 (1943). Rossi and Regener, *Phys. Rev.*, **58**, 837 (1940).
[4] See *Proc. Roy. Soc.*, A, **180**, 220 (table I) (1942).

Base Electrolytes for Use in Polarographic Determinations

IN the course of recent research on the application of the polarographic method to the routine analysis of magnetic materials of the 'Permalloy' type, we have found several new base electrolytes which offer considerable advantages for quantitative polarography. They are characterized by the very satisfactory shape of the 'waves', in general free from disturbing maxima, which they yield with a number of metal ions.

Our main problem at the commencement of this work was the determination of iron (12–18 per cent) and molybdenum (2–5 per cent) in the presence of more than 70 per cent nickel and some copper, manganese, etc. We have succeeded in devising and applying our methods to give extremely rapid and accurate routine determinations of these elements in particular, so that to date some six thousand individual determinations have already been made, with a considerable saving of time.

The sample is dissolved in a sulphuric acid–nitric