type sudden commencements to the total number of sudden commencements at each of the stations 1-6 and at Greenwich. It will be seen that the points lie more or less on a smooth curve with a minimum near the longitude of Honolulu and a maximum near the longitude of Greenwich. It is also interesting to note that the values of this ratio for Cheltenham and Huancayo, which have nearly the same geomagnetic and geographic longitude, are approximately equal; also, that in the period of 46 years of records examined from Honolulu, there were only nine second-type sudden commencements. But a similar analysis at other stations, and particularly over the continent of Asia, will be needed before the suggested dependence of this type on geomagnetic longitude can be definitely established. We would urge other observatories to make such an analysis, which would help towards the understanding of these sudden movements in the earth's magnetism and the extraneous factors which are likely to influence them.

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¹ *Mon. Not. Roy. Astro. Soc., Geophys. Supp.*, 5, 159 (1948).

graph shows the results obtained at barometric pressures between 750 and 760 mm. mercury. At the absorber thickness of 18.2 cm. lead, within the plateau of George and Appapillai, we observed a maximum smaller than the standard deviation; at 26.6 cm., however, the second anomaly consists of a maximum amounting to 2.5 times the standard deviation; thus we consider it to be real. At barometric pressures of more than 760 mm. mercury, this maximum shifts to smaller absorber thicknesses; at pressures lower than 750 mm. mercury, it is to be found at larger absorbing layers. Further investigations into this effect are being carried out.

It should be mentioned that Clay and co-workers²⁻⁴ demonstrated the existence of a second and third maximum—besides that at 1.6 mm. lead—on the ionization curve at about 16 and 25 cm. lead, as well as⁵ a second maximum between 16 and 21 cm. lead on the shower curve, both curves being plotted against the absorber thickness.

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¹ George, E. P., and Appapillai, V., *Nature*, 155, 726 (1945).

² Clay, J., *Physica*, 3, 332 (1936).

³ Clay, J., Gemert and Wiersma, *Physica*, 3, 627 (1937).

⁴ Clay, J., Venema and Jonker, *Physica*, 7, 673 (1940).

⁵ Clay, J., and Scheen, *Physica*, 14 (viii) (1948).

Anomalies of the Absorption Curve of Cosmic Rays in Lead

INVESTIGATING the absorption of the vertical component of cosmic radiation in lead by means of a Geiger-Müller counter-telescope, George and Appapillai¹ found in 1945 at sea-level (London and Colombo) that the absorption curve showed a plateau at about 10 cm. absorber thickness. Repeating the experiment in Budapest, we eliminated barometric and temperature effects (this proved to be important) by simultaneously measuring two consecutive points on the absorption curve. We found a second anomaly between 20 and 30 cm. of lead, besides that mentioned by George and Appapillai.

Using counter-telescopes of various sensitive solid angles, the effects showed up more definitely with small angles; most recently, we have used a counter-telescope with counter tubes of effective length 50 cm. and diameter 6 cm., the top and bottom tubes being 90 cm. apart. The accompanying

Preparation of Colloidal Silver-Iodide Water-Suspensions for Nucleation of Supercooled Clouds

IN the course of a search for a suitable form in which particles of silver iodide can serve as nucleating agents of a supercooled cloud, Vonnegut tested¹ an aqueous solution of silver iodide (200 gm. of silver iodide and 100 gm. of ammonium iodide in a mixture of 750 c.c. of acetone and 250 c.c. of water). It is reported by him that "solutions can be diluted any desired amount with acetone; dilution with water causes precipitation of AgI". On the other hand, it was known² that in experiments on artificially induced rain from supercooled clouds in Algeria, a colloidal aqueous suspension (1/1,000, 1/10,000 by weight) of silver iodide was used with success. Since no particulars of this colloidal aqueous suspension were available, it was decided to try to produce a colloidal suspension (a) as stable as possible, (b) one that can be diluted to any proportion with water.

The preparation was based on well-known principles: the solubility of crystalline substances, apart from their peculiar behaviour, is a function of the size of the particles. Particles less than 1μ have a greater solubility than larger ones; moreover, the value of S (solubility) depends upon (a) the excess of common ions, (b) the concentration of reactive components, and (c) the total electrolytic concentration. 0.716 gm. of potassium iodide was dissolved in 140 c.c. of water. While vigorously stirring, a solution of an equivalent amount of silver nitrate (0.734 gm.) dissolved in 80 c.c. water and 20 c.c. acetone was added drop by drop. If the stirring is sufficiently rapid, the rate of addition can be increased. This suspension was then diluted with 760 c.c. water. The silver iodide particles are protected against coagulation by the 'own-ion effect'