calculate I_{lp}, I_{ls}, and I_{as}, and so deduce a relation between the ionizations produced in a given lead cylinder by the gamma rays which enter it and by the secondary rays excited in the walls of the vessel by these penetrating rays.

The averages of a great many measurements made in this way with the cylinders Nos. 1, 2, and 3 are given in

TABLE IV.

Cylinder No.	Natural ionization (Arbitrary Scale). Reading "*a*."	Natural ionization (Arbitrary Scale). Reading "*b*."	Combined ionizations in unlined lead cylinder (Arbitrary Scale). Reading "*c*."	Combined ionizations in aluminium-lined lead cylinder (Arbitrary Scale). Reading "*d*."
1	7·7	4·02	97·75	53·52
2	53·94	4·48	142·44	48·87
3	12	4·67	113	57·97

Table IV.; and in Table V. the numbers corresponding to the reduced values of these observations are recorded.

TABLE V.

Column 1. Cylinder No.	Column 2. Ionization due to gamma rays from radium and secondary rays excited in lead by these rays. $I_{lp}+I_{ls}$. (Arbitrary Scale.)	Column 3. Ionization due to gamma rays from radium and secondary rays excited in aluminium by these rays. $I_{lp}+I_{as}$. (Arbitrary Scale.)	Column 4. Ratio $\frac{I_{ls}}{I_{lp}}$ (calculated)	Column 5. Ratio $\frac{I_{as}}{I_{lp}}$ (calculated)	Column 6. Value of ionization in unlined lead cylinder due to penetrating rays from radium = I_{lp} (calculated).	Column 7. Value of I_{lp} corrected for absorption (calculated).
1	90·05	49·5	1·74	·49	33·05	39·0
					$\left(\frac{100}{84 \cdot 64} \times 33 \cdot 05\right) = 39 \cdot 0$	
2	88·50	44·39	2·31	·66	26·7	32·0
3	101·00	53·3	1·95	·56	34·2	38·0
		Mean ...	2·00	·57	31·32	36·3

Applying equations (i.), (ii.), and (iii.) to the measurements with cylinder No. 1, as an example of the manner in which