

Date  
16/02/24

B.Sc. DU

Paper-IV 'C'

### Cosmic ray showers →

The rays arrive in groups that appear to have been produced simultaneously by some common cause. Several years before the discovery of this phenomenon (cosmic ray ~~it~~ has been given the name showers). Its effects were observed in the occasional sudden bursts of ionisation in cosmic ray ionisation chambers at all altitudes.

When a ionisation chamber is used to study cosmic ray intensities, it is found that occasionally the intensity rises momentarily to several times its normal value. This indicates sudden bursts of ionisation. Such a burst of particles is called a cosmic ray shower. Rossi in 1932, investigated the phenomenon by using an arrangement of three co-incidence counters in a triangular pattern with a lead plate above the counters (in fig).

A co-incidence discharge of the three counters  $c_1$ ,  $c_2$  and  $c_3$  can be produced only by the simultaneous passage of at least two particles, including the incident one. Rossi observed that an appreciable number of co-incidence counts were registered. ~~He~~ Found that the no. of co-incidences increased as the thickness of the lead plate was increased as the thickness of the lead plate was increased. From this result he inferred that



The three counters were affected by two or more secondary particles produced simultaneously by a single cosmic ray as it penetrated the lead plate. Thus the production of showers in lead plate was detected.