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PENETRATING RADIATION ASSOCIATED WITH THE X-RAYS.

As the following investigation is made with the aid of nuclei, certain of their properties bearing on the present subject will first have to be specified. Exhaustions are preferably made at a pressure difference (δp) just below the point (to be called *fog limit*) at which dust-free non-energized saturated air condenses without foreign nuclei. δp depends on the particular apparatus used.

1. *Fleeting Nuclei.*—Let the X-radiation to which the dust-free air is exposed be relatively weak, so that the density of ionization may remain below a certain critical value. The nuclei observed on condensation are then very small and they require a high order of exhaustion, approaching the fog-limit of non-energized air. They are usually instantaneously generated (within a second) by the radiation, so that their number is definite independent of the time of exposure. They decay in a few seconds after the radiation ceases; *i. e.*, roughly to one half their number in two seconds, to one fifth in twenty seconds in the usual exponential way. I fancy that these nuclei are what most physicists would call ions; but nevertheless the particles are not of a