prove that these 'Kathode Rays' not only cause fluorescence, but (1) proceed in straight lines independently of the position of the anode, (2) violently heat the glass or the objects on which they impinge, (3) can set fans in rotation by their impact, (4) are deflected by a magnet, and (5) repel each other when two streams are sent in parallel directions.

Three views have been held with regard to these Kathode rays. Crookes maintained that they were streams of the remaining molecules of the rare gas, which having conveyed the positive charge to the Kathode left it with a rush which carried them far down the high vacuum before the rare collisions with other molecules brought them back to the usual state of confused motion in all directions. To the gaseous particles in this high vacuum he gave the name of "radiant matter," or matter in the fourth state of aggregation. Dr. Puluj, of Vienna, controverted Crookes' opinions, and made careful researches to prove that the rays were streams, not of gaseous molecules, but of particles actually torn from the Kathode itself.

Finally Hertz and Lenard came to the conclusion that they were not matter at all, either gaseous or belonging to the electrodes, but "Processes in the Æther," *i.e.*, vibrations or radiations of some kind analogous to ultra-violet, or infra-red light.

Three years ago when Prof. Hertz and Dr. Lenard showed me these rays, for the first time brought outside the glass wall of the tube, in Dr. Lenard's room at Bonn, they spoke of them as "molecules," but in the later part of his research Lenard proved that when once excited they could travel across the highest vacua, and for this and other reasons concluded they were phenomena of the Æther.[1] Dr. Lenard placed an aluminium window opposite the Kathode, and the rays passing through the metal caused fluorescing bodies to shine at distances of 6 centimetres in air, 4 in carbonic acid, and as much as 30 centimetres in hydrogen. Lenard found they affected a photographic plate, and even obtained some shadow photographs by their means.

It was not till last December that the next step was made known to the world by Dr. Roentgen in a paper communicated to the Academy of Wurzburg. It appears that while experimenting with a Crookes tube, which had been covered with black cardboard, in order to see if the eye could detect any rays emerging from the tube and capable of penetrating the opaque covering, Dr. Roentgen noticed that fluorescence was being excited in a screen painted with fluorescing material at some distance from the tube. Following up the hint, he obtained the effect up to distances of two metres, and by means of

[1] Lenard Weidemann's Annalen, 1894.