

(g) low vacuum or low density is a name applied to the Crookes' tube when less electromotor force is required to drive the electricity through the tube, and the consequent penetrating power of the ray is much less than that of the high vacuum tube; (h) the fluoroscope is an instrument of great importance to the operator of the Röntgen ray. This instrument was devised by Prof. Edison, and is composed of a pasteboard screen, covered with either fused tungstate of calcium or barium platino-cyanide set in a pyramidal box having this screen as the bottom. This screen serves to the operator the same as the lens does to the telescope manipulator. Prof. Edison has experimented with many different salts, but up to the present writing the barium platino-cyanide is by far the superior to any yet discovered for use in conjunction with the Rontgen ray. By the use of this instrument the operator is enabled to tell with what degree of perfection his tube is being excited and so aid him greatly in shadow-photography, or an examination may be made by the use of this instrument without the trouble or expense of having a shadow-photograph taken. It is a common practice of the operator of the Röntgen ray apparatus to test the penetrable power of his tube by looking through his hand and noticing the distinctness of the bony outline. I am much opposed to such a practice, as injurious effects may sooner or later develop if he uses the coil apparatus to a considerable extent. I should advise a metallic or other object to be placed in a book or box and to be looked at each time he operates, and soon his eye will become accustomed as to the clearness of the object when the tube is working to perfection. This method, as I advise, is equally instructive, and not at all injurious to the manipulator.

In the development of the Röntgen ray there are three main apparatuses used to excite the Crookes' tube—namely, (1) the static machine; (2) the induction coil; (3) the Tesla transformer.

In order to do Röntgen ray work from a static machine the size of the machine must first be taken into consideration. As a rule, an eight plate or more does the best work, although the ray can be obtained from as small a machine as a four plate, but not with any satisfactory results. There are three methods employed to excite the tube by a static machine; (a) the convective, (b) the interrupter spark gap, (c) the Leyden jar oscillating current. The only difference in all these methods is in the connection. A description of each is here given. (1) In the convective method, simply connect the tubes to the prime conductors and be sure that you have connected the anode of the static to the anode of the Crookes'