

positive electricity which could be carried by an insulated handle to a leyden jar, and a charge could be put into the leyden jar. This process repeated *ad infinitum* would go on storing up a charge until at last the leyden jar contained a considerable charge. The various induction machines are made on this principle so that a constant supply of electricity is produced, and carried off to be made use of. One side of the plate is negative and the other positive. These machines which used to consist of but one pair of plates are now made up of large numbers and considerable sized plates up to six feet. Lord Blythwood, in Glasgow, has a machine of 120 plates, the largest in the world. Instead of being driven by hand they are driven by dynamos at from 300 to 400 revolutions per minute, so that practically any amount of electricity may be obtained from this source of high tension ready to illuminate one of these tubes. The charge in this tube can be regulated by the length of the spark gap in the circuit, the longer the spark gap is, the greater the amount of electricity passing through the tube at the time and the number of sparks are so numerous that the light from them becomes continuous and almost without a flicker.

An induction coil consists of a coil of copper wire wound around a central core of soft iron and consisting of comparatively few turns from 100 to 200 according to the size of the coil and requirements, called the primary. Outside this and carefully insulated from it, is wound a coil of exceedingly thin wire of many turns, some thousands, called the secondary coil, the primary and secondary together constituting the induction coil which is excited by a pulsating or interrupted current. At every pulsation or interruption a current of electricity passes through the primary and produces an induced current in the secondary, and the intensity of this current is regulated by the ratio of the number of turns of the secondary to primary. The terminals of the secondary are attached to the terminals of the Crooke's tube, and for every pulse of current in the primary a spark is passed between the terminals of the tube. These sparks are so numerous that they give the appearance in the tube of continuous light.

From either of these sources the electricity is obtained, and many are the arguments pro and con as to which is the better. If any of you are desirous of going into the apparatus for yourselves I shall be glad to give you all the information I can, but it is not necessary to enter into all these arguments at the present moment. Either source of electrical excitation will answer for the present consideration, and both are used and have their staunch friends.

The rays which are known as X-rays are not luminous themselves, in fact, are invisible. They penetrate through many substances such as