his discovery of magnito-induction. In Farada's discovery, Electric Lighting takes its rise, and from his time date the inventions that have made it a possibility.

Following Farada, Pixi and Saxton produced the magneto-electric machine.

The Pixi machine is composed of a strong horseshoe permanent magnet, before the ends of which two spools of covered wire wound on U shaped iron coves are made to revolve. In forming the U shaped magnet, one end of each spool cover is connected with an iron bar, the other end remaining free, and they thus form what is termed an electro magnet. At each half revolution or on every passage of the free ends of the spools, before the ends of the horseshoe magnet currents are induced in the spools, by reason of the magnetism imparted to the iron coves by the large permanent magnet, the currents alternating in direction at every passage, the strength of the current depending on the speed of the spools.

The explanation of the action I have referred to is as follows: between the free ends of any permanent magnet are continuously maintained lines of force so termed, made visible by the familiar experiment of placing iron filings on a glass plate over the poles of the magnet, and gently shaking the filings into position, when they assume the form of the passing lines of force or magnetism. When a single closed wire coill is passed from the weakest to the strongest part of a field of magnetic force, a current is generated in the wire. If we multiply the convolutions of the single coil 50 or 100 times, we can by one rotation of the drum on which the wire has been wound cut the lines of force 50 or 100 times, and remembering the strength of the current is proportiona to the speed and length of the wire (the strength of the magnet remaining the same), we thereby increase the pressure of the current as many times as there are turns of wire on the drum.

The lines of magnetism may be represented, though imperfectly, by the lines or rays of heat being radiated from a heated body. If we imagine a copper drum to be rotated in front of the heated body, and on the opposite side of the copper drum place a mass of metal kept at a low temperature, the copper drum on being rotated takes up a portion of the heat given off by the heated mass, and imparts that heat to the cold mass. The simile is this: a given amount of energy as heat is converted by the drum on each half-revolution. In the dynamo-machine a given amount of energy in the form of magnetism is converted on each half-revolution. The amount of energy converted depending upon the difference in potential energy represented in either case.

The simile is almost exact, for, in either case, the conditions remaining the same, the energy converted is proportional to the speed and to the work done.

Some ten years later than Pixi's invention, a compound Pixi machine was constructed, and gave Farada great pleasure. He saw in it the growing infant he had before given the world.