## ELECTRICITY AS A MOTIVE POWER.

The great question which occupies the mechanical world at the present time is the suppression of distances. Steam and electricity have already produced such surprising results that human activity, aided by the incessant progress of science, continues to aim at still greater results. In addition to the tele graphic system, which transmits thoughts to limitless distances; in addition to steam, which has afforded us so many powerful manifestations; and in addition to the telephone, which annihilates distance and brings human speech from widely separated quarters of the globe into close contact—we stand now in the presence of a new problem, the solution of which is faintly presented to our view through the misty clouds which envelop the future. This problem is the distant transmission of power by means of electricity. It is many years since the question was first presented to the world, and that it is capable of solution is easily understood. The immense quantity of wasted forces are sought to be utilized—concentrated at some central locality, in the midst of a flourishing population, there to be brought into subjection, and augment to vast proportions the public wealth.

With a view to solve this problem, savants have long been occupied with numerous experiments to convert electricity into mechanical power; but the feeble results of electro-magnetic machines have been, from the commencement, an obstacle, before which science has been compelled to halt, and the logical conclusion has been drawn, from a multitude of experiences, that it is as difficult to convert electricity into mechanical power as to manufacture diamonds from carbon. But latterly great strides have been made in the direction of success, as appears from the experiments at Sermaize, in France, where plowing by means of electricity has suppressed distance and reduced the transmission of power to a practical issue. We have here the most curious as well as the most interesting demonstration of the great principle of the correlation of physical forces.

From a mechanical point of view this question of the electric transmission of power is not clear cut. It still remains in experiment, but will, in a short time, become a certainty. We can, even now, form a very correct estimate of the results which have been obtained. A distinguished engineer, M. E. Hospitalier, in giving a resume of all the experiments with electricity transformed into a mechanical power, says (we translate from *La Correspondence Scientifique*): When a dynamo-electric machine is put in motion by a motive force of a given power, it produces an electric current. This current, conveyed to a second and similar machine, is transformed again into a working or motive power, which can be utilized to the extent of 50% of the initial force required to put the first machine in motion. Numerous experiments upon the Gramme and the Siemens' machines leave this figure indisputable. Suppose, however, that the current is transformed into 20% only of the initial force, and we would produce immense results. Imagine a steam engine of 400-horse power located in a manufacturing centre of Paris, and putting in motion a certain number of Gramme or Siemens' machines, thus producing enormous quantities of electricity, which could be transmitted in every direction by means of wires to a greater distance than one mile, we would have 100 effective horse power, with this great advantage, that the simple placing or displacing of a small wire would regulate the demand for power without special instalments. Every horse power could be subdivided into a greater or less number of parts without diminishing the result, and as easily as can be effected with the electric light. We could, for instance, put in motion 10 sewing machines, 5 lathes, 3 card cutters and 2 saws in 20 different places with the current produced by one single machine, producing a one-horse power, and all the work performed by these 20 different industries, costing but 10 pounds of coal per hour. Would not the expense of rent, engineer, care, etc., be greater in comparison? These electric motors are not ponderous. One invented by Marcel Deprez, which will do the work of one man, weighs less than 37 pounds, while the motor for a sewing machine does not exceed eight ounces. These motors, it will be understood, are the mechanical means of transforming electricity into mechanical power. They produce neither steam nor smoke, and cannot explode. They are easily transported, and are always ready, by simply attaching a wire, to perform faithful and constant labor. We can readily perceive that great advantage would result to industries requiring small powers from a distribution of electricity, which would give motive power under such favorable conditions. It only remains to determine the value of mechanical results. That this will be done, is a question of only a few months, in spite of the predictions of W. E. Ayrton, in his lecture before the scientific meeting at Sheffield, that the realization of this power would not be effected before the next century. We have only to point to the practical results at Sermaize in France.

THE ENGLISHMEN AS A READER.—The English gentlemen has for more than a century found the time to cultivate athletic sports without sacrificing his professional work, and, to put it in Mr. Ragehot's words, to "spend half of his day in washing the whole of his person"—a by no means unimportant start over the Continent, where such civilisatory habits could only be introduced a very short time ago. But the Englishmen of business has not only time to devote to his body, he has also leisure to cultivate his mind. England is the only country where people read, where they read instructive books, I mean, not only novels. Next to England ranges France, where the species of "general reader" still exists, although it is on the wane, and people begin to put their Thierry and Guisot nicely bound on their bookshelves, convinced that they have in this way sufficiently proved their respect for higher literature. As for the Italian, he seldom masters courage and perseverance enough to read more than a newspaper article of one paragraph; and the German, as everybody knows, reads a book only when he wants to write another book destined to supersede the one he is reading. The English alone find the leisure and the humour to read works of a general but serious character. I do not enter a sitting room without finding some new volumes on the table; if expensive, coming from Mudie's or Smith's library—which always supposes that such a library purchases at once a hundred copies or more of a book—or, if cheap, bought at the next bookseller's shop. No wonder, when on opening one of these by no means "popular" works. you read "seventh thousand" on the back of its title-page. On the Continent such a thing happens only with books destined for amusement or for the flattering of vulgar passions and vulgar curiosity, such as M. Tissot's and Herr Busch's twaddle. The leisure, coexisting with hard work, and the noble use made of leisure, are perhaps the most remarkable results of the enormous wealth which first strikes the eye of the foreigner in England. —*Nineteenth Century*.

ELECTRIC STENCIL PLATES.—MM. Bellet and D'Arros, of Paris, have patented a novel method of producing stencil plates, either of written matter or sketches, by means of electricity. A small Rhumkorff coil is the source, and they proceed as follows: A metal plate is united to one of the poles by a wire, and the other pole is connected to the core of an ordinary black lead pencil or other suitable point by means of a very fine wire. On the said plate is gummed a sheet of very thin paper, or other like material, previously dipped in water containing sea salt, and the induction coil is then set in action, and the design it is required to reproduce is drawn on the paper attached to the plate with the pencil or point aforesaid, by which means the two poles are brought together, and the electric sparks pass continuously from the pencil point, producing on the paper small holes corresponding in outline with the design executed. The plate must be placed on some insulating material. The design in writing is thus furnished, the metal plate is dipped in water and the paper carefully removed. The stencilling thus obtained may be readily transferred to stone by inking a sheet of paper with transfer ink, placing the stencil thereon, covering it with a sheet of white paper, and pressing it sufficiently to cause the ink to pass through the holes in the plate. A lithographic plate is thus obtained which can be transferred in the ordinary way, and can be made of zinc by which a typographical stereotype may be produced. The inventors likewise produce etchings and engravings by covering the plate with a suitable varnish, and using the same electrical agency for tracing the design, after which it is eaten in by the ordinary nitric acid bath.—*Inventors' Record*.

TELEGRAPHING WITHOUT WIRES.—Professor Loomis continues his experiments in the mountains of West Virginia, to demonstrate the theory that at certain elevations there is a natural electric current, by taking advantage of which, telegraphic signals may be sent without the use of wires. It is said that he has telegraphed eleven miles by means of kites flown with copper wires. When the kites reached the same altitude, or got into the same current, communication by means of an instrument similar to that of Morse was easy, but ceased as soon as on of the kites was lowered. He has built towers on two hills about twenty miles apart, and from the tops of them has run up steel rods into the region of the electric current.—*Journal of the Telegraph*.