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TRANSMISSION OF POWER BY MEANS OF ELECTRICITY.

M. Marcel Deprez has sent to the Academy of Sciences the following official report of the committee of the Munich Electric Exhibition on the experiments made on and after the 26th September, 1882, concerning the transmission of power by dynamo electric machines:

"By means of two dynamo-electric machines (Gramme system) of identically similar make, M. Marcel Deprez has transmitted to Munich (over a distance of 57 kilometers) along an iron telegraph wire of 4·5 millimeters diameter the power obtained at Miesbach from a steam engine. The receiving machine placed in the Crystal Palace supplied motive power during eight days to a centrifugal pump feeding a small waterfall of about 2·5 meters in height. The dynamo-electric machines were set in motion for the first time on September 25, at 7 P.M., and according to the data of M. Datterer, an engineer appointed by the committee, the receiver placed at Munich rotated at a speed of 1,500 revolutions per minute; the brake used to measure the work was loaded with 1·5 kilogrammes.

"A series of accidents, due to the fact that the machines were made for laboratory experiments and not for practical work, put a stop, at the end of eight days, to the till then entirely satisfactory working of the machines. The hoops which surrounded the ring of one of the machines broke; owing to this, the wires of the ring, 0·4 millimeter in diameter, were injured and had to be reinsulated. In the small town far away from Miesbach these repairs could only be carried out under great difficulties, and necessitated much patience and perseverance on the part of M. Marcel Deprez's assistants.

"On October 9 and 10, when the Experiment Committee began to take measurements, a speed of only 1,600 revolutions per minute could be reached with the machine that had been repaired at Miesbach; the results obtained were, therefore, far less favorable than they would have been with the normal speed of 2,000 revolutions obtained at first. For some moments only during the measurements could the speed of 2,000 revolutions per minute be obtained, and, again, at the commencement of the experiments one of the brushes of the machine came off, which produced an extra current, and completely destroyed the machine.

"The results obtained under these unfavorable circumstances, under the direction of Professors Dorn, Kittler, Pfeiffer, and Schröter, were as follows:

	Ohms.
Resistance of the line.....	950·2
Resistance of the machine at Miesbach	453·1
Resistance of the machine at Munich.....	453·4

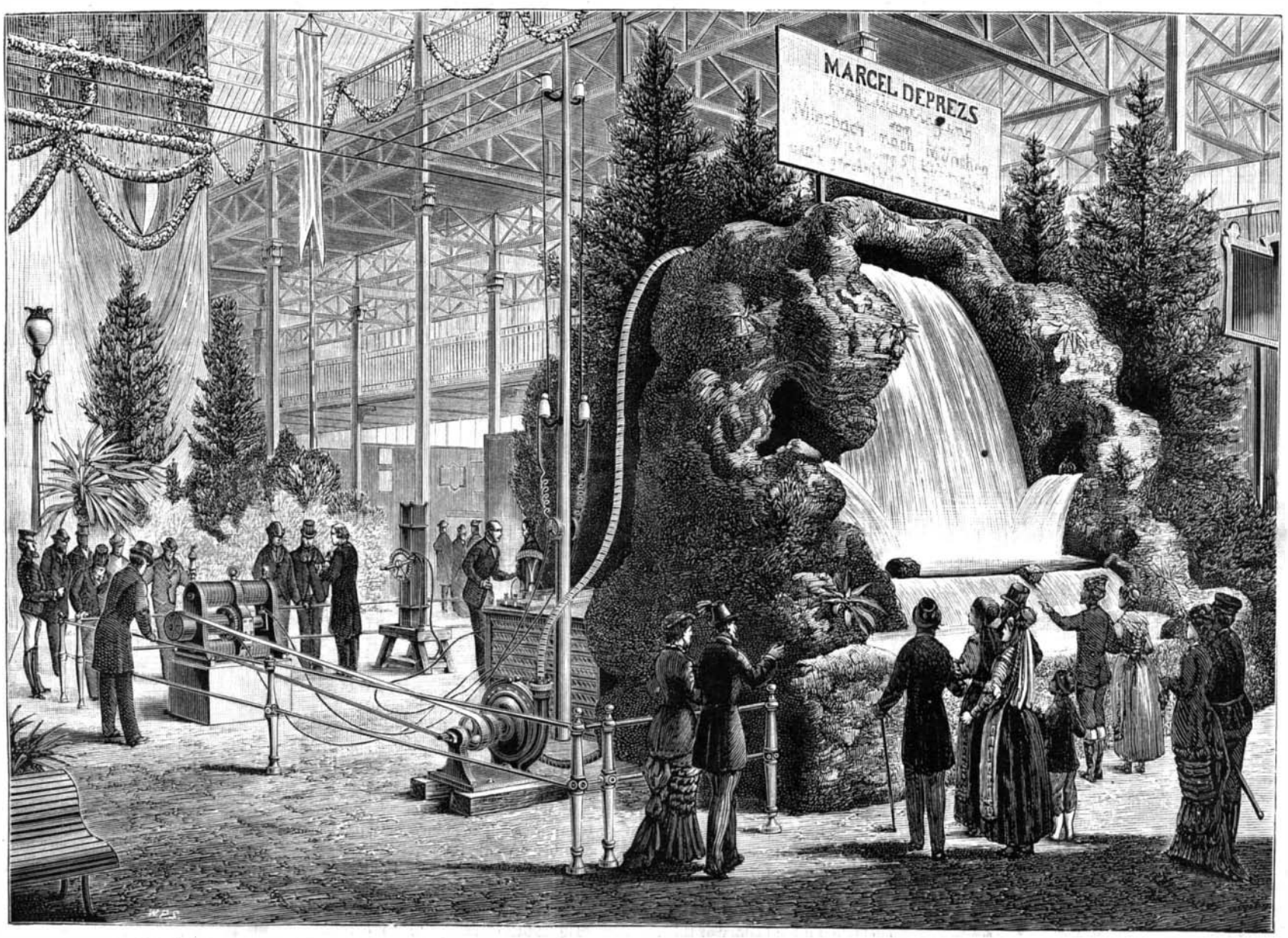
"The only experiment which need be mentioned lasted five minutes, on October 10, between 12:32 and 12:37. The number of revolutions per minute of the machines was at Miesbach 1,611, and at Munich 752; the current at Miesbach was 0·519 ampere, and the electromotive force at Munich 850 volts. Summing up and taking into account the length of the line, but not losses, we have at Miesbach an electromotive force of 1,343 volts, a total electrical work of 1·13 horse power, work equal to 0·680 horse power expended in the circuit in heating, and 0·433 horse power at disposal for the transmission of a power which is equal to 38·9 per cent of the total electrical work. The direct estimation of the effective work, undertaken at the same time as the electrical measurements, did not give any exact result; in the first place, the Munich machine had not a sufficiently solid foundation, and part of the work was absorbed by the vibrations of the machine; secondly, the Hefner-Alteneck dynamometer, used at Miesbach, was constructed to measure from 15 horse power upward, and the limits of error of this apparatus were too large for the small power required to be measured. The work obtained at the brake at Munich rose to 0·25 horse power; to this should be added the work absorbed by the vibrations of the machine. In the place of direct measurements a more exact value of the work expended at Miesbach will be arrived at by reckoning the electrical work expended at Miesbach and the return from the machine at Munich, which was identical with that at Miesbach, a return which can be estimated by the figures given above, taking into account the vibrations.

"As, owing to the numerous accidents indicated above, the results obtained during the measurements made by the Experiment Committee were much less favorable than those made during the first experiments, M. Marcel Deprez has decided to repeat the experiment at Munich, with more solidly made machines, and then only, we think, can a decisive judgment be given as to the return. Meanwhile, we do not hesitate to proclaim the success of the transmission of power from Miesbach to Munich as in every way an important event in the history of the technical applications of electricity."

We are indebted to *La Lumière Electrique* for our engraving, which represents the arrangement of the receiving apparatus as worked at the Munich Exhibition. For the above report we are indebted to the *Electrician*, which translates from *L'Electricien*.

The Mineral Industry in Spain.

According to statistics made for 1880, Bilbao is at the head of the iron ore exporting provinces of Spain. In 1880 the exportation was about 1,350,000 tons of ore; after this Murcia, Santander, and Almeria come, with about 375,000 tons. In the third place are Oviedo and Malaga, then Guipuzcoa, Huelva, and Navarra, and the last are Sevilla, Logrono, Badajoz, Pontevedra, Leon, Burgos, Teruel, Lugo, Guadalajara, Alicante, and Coruña. Huelva, Almeria, and Tarragona produce the principal quantities of manganese ore, Oviedo, Teruel, and Gerona take the second rank as producers of this mineral. Oviedo produces more than half of the coal of Spain. Cordova and Palencia produce only 75,000 tons; then Sevilla comes with about 25,000 tons, and then Leon, Gerona, Ciudad Real, and Burgos, with a great deal less. In 1880, 2,597 mines, ninety-three fields, and two escorials were explored, which is ninety-three fields and two escorials more than in 1879. The number of workmen employed was 52,495 men, 1,222 women, and 6,188 boys. The number of steam engines used was 372, with 8,893 horse power, which shows an increase of fifty-eight engines, with 1,632 horse power, as compared with 1879. The production of iron ore of 1880 compared with 1879 shows an increase of 905,000 tons; that of manganese ore, 208 tons; that of coal, 80,000 tons.



DEPREZ'S EXPERIMENT ON THE TRANSMISSION OF POWER FROM A DISTANCE BY ELECTRICITY.