THE ELECTRICAL STORAGE OF ENERGY.

In a lecture delivered before the Newcastle (Eng.) Literary and Philosophical Society, Mr. Swan, after describing what was meant by the storage of electricity, said:—

What they wanted was to have energy so stored that the electric current might be actually waiting to pass, ready to flow at any moment when the channel in which it had to circulate was completed. Happily there was a way of obtaining an electric current in a very direct manner by means of stored chemical energy. This chemical energy might be dormant for any length of time and give no outward sign of power, and yet in an instant, as by a touch of a magician's wand, it sprang into powerful action. Sir William Thomson had made careful measurements of the energy stored in the Faure cells, and found that one weighing 1½ cwt. could store energy of one horse-power for one hour, If they supposed that store cells were applied to produce electric light, at this rate one ton of cells would supply sufficient current for ten Swan lamps during six hours. Two things were clear from this—first, that unless the price at which such cells were sold was much higher than the intrinsic value of the material of which they were made and their simple construction suggested, their cost need not be prohibitory of their use ; second, that the bulk and weight of a set of cells to do any considerable amount of work would be too great to admit of the idea that it would be practicable tomove them for the purpose of charging. In some exceptional cases the cells might be carried from place to place, just as gas was occasionally carried in bags. It was much more easy to carry the electric current from a fixed and distant dynamo-electric machine to the store cells by means of wires than to carry the cells to where the dynamo was, just as it was easier to carry gas to a distant place in pipes than in a metal gas holder. There were, however, special cases where store cells might with advantage be carried to a distance to be charged, and one such case was that of coal mines, where it might be found convenient to employ small store cells in portable cases, and to send them to a safe and central part of the pit, where a dynamo might be fixed for charging a portable case of store cells and lamp of this kind were exhibited, the cells being some belonging to Professor Herschel. The case was carried by a leather handle, and the lamp, which consisted of a clear double glass globe, entirely closed, and guarded by strong wire, was attached to it by means of a wire-conductor of considerable length, so that a miner might hang up the lamp where he was working, and place the charge cells a little distance away. The light emitted by the lamp was clear and much superior in quality to the light of an ordinary safety lamp, and the lecturer remarked, as air was not required for it, and as the globe was air-tight, it was a safety lamp in the strictest sense of the word. He thought also it would have the advantage of being an economical lamp. For lighting railway carriages he thought the most feasible arrangement would be to have a small dynamo and sets of store cells for each carriage. The arrangement for working the dynamo might be extremely simple. The armature might be attached to one of the axles of the carriage. Whenever the carriage moved there would be a current of electricity generated if the circuit was closed through the lamp and store cells. When the cells were full they would be thrown out of action automatically. The same dynamo could easily be applied to store current in another set of cells, to be used for the working of an electro-magnetic brake, which might be of great power, with very small abstraction of the motive power of the engine, for the principle of accumulation here came into play most advantageously. Whether railway carriages and tramcars were to be in future driven by electricity was not yet a settled question, but it was certain that whenever (if ever) they were so driven, electric storage of energy would play an important part in bringing it about, Some people had the idea that by means of store cells they should have portable electricity extensively employed—a daily supply of electrically stored energy delivered at their doors like milk, the empty cells to be taken away when the full ones were brought. It was not likely that this idea would be realized. There was no form of energy so easily conveyed to distance as the energy of electricity, and to think of carrying it about in boxes instead of sending it on its distant journey through wires was to ignore one of its most valuable properties. The probability was that in every house lighted by electricity, there would be a fixed set of cells occupying a place, and perhaps also a space not unlike that which a water cistern occupied in a house. These cells would be in a communication through insulated and hidden wires, with a main central electric supply, and would either be kept charged by continual connection with the main, as their water cisterns were, and with a regulating appliance equivalent to the automatic feed of a water cistern ; or the current would be turned on for a few hours each day until the cells of one district were fully charged, and then the current would be turned on to another district to charge cells of that district. With reference to the application of electricity to the production of motive power, at present they depended on motive power for the production of electricity. It was, therefore, a roundabout process to introduce motive power from motive-power-produced electricity. Still, there were cases in which the economy of producing motive power on a very large scale, and the facility with which this power might be subdivided and distributed by means of electricity would make the reproduction of motive power in this roundabout way both economical and convenient, notably in cases where at no great distance from a town or populous district, requiring motive power for industrial purposes, there was some great stream or waterfall, and in connection with electrical storage it was within the scope of probability that the fitful power of wind and the intermittent power of tides might be made more practically serviceable in the development of motive power. It was quite a common anticipation—perhaps most strongly entertained by those who had least knowledge of the question—that electricity would one day supersede steam. The possibility of this could not be denied, but at the same time it was equally undeniable that they were a long way from such a revolutionary change. They did not even see the road by which it was likely to come. They merely saw that the steam engine, admirable as it was as a piece of mechanical ingenuity and skill, was yet waste of energy to the last degree. Sir William Armstrong had put down the waste of heat in a steam-engine of the best construction at 90 per cent. Only 10 per cent. of the heat stored in coal and actually evolved was utilised in the resulting motive power. This enormous waste of heat energy in the steam-engine certainly left room for hope that some even more economical means of producing electricity than that possessed by the dynamo-electric machine might be discovered.—*English Mechanic*

COLLAPSE OF A LARGE GASHOLDER.

The Newark *Daily Journal* gives the following account of the collapse of the gasholder belonging to the Citizens' Gaslight Company, on the evening of January 31st ult.

About seven o'clock it became evident to those in charge of the works of the Citizens' Gaslight Company on Front street, that the iron frame which held the gasholder was giving way. Two of the columns were cracked, and the fierce gale which was blowing caused the iron frame to bend and twist, so that at every moment the structure was expected to go down. Mr. Andrew A. Smalley, the president of the company, was sent for, and he immediately stationed men at each end of the street to warn those who might intend to pass of the danger. Several families residing in the neighborhood left their houses and some prepared to remove their furniture. The gasometer was 97 feet in diameter, with a capacity of about 300,000 feet, and was about one-third filled. The gas was being drawn off and transferred to another holder, when, a few minutes before nine o'clock, the structure went down, and as it fell, with a hissing sound, a column of flame more than 50 feet shot in the air. People were momentarily blinded with the sight. Women became frantic and even some men thought for a moment that the day of judgment had come. The flame was visible only for a minute, and then the whole portion of the city north of the canal was left in total darkness. The fire department turned out, but there was no occasion for their services. No person was injured, and, with the exception of the blistering of paint on the cupola of Ballentine & Sons' brewery, no buildings received any serious damage.

Mr. Smalley stood in a doorway within 30 feet of the gasometer when it fell, and he remained there. He says he had no fear. He believes the flame was caused from sparks struck from the iron frame when in falling it crashed against the sides of the tank. The gasometer was torn and rent like a great balloon cut in pieces. There was no explosion ; it was simply a collapse. About 20 feet of the wall along Front s reet is broken down, and 10 feet of the coping thrown from the side wall. Beyond the destruction of the gasometer and frame this is all the loss the gas company has sustained, except the loss of gas and custom. The damage is estimated at $20,000. The tank is uninjured.