the gates are raised the water pours from these penstocks into the wheels that give motion and life to the big generators. As the water passes through, or is discharged from, the turbines, it falls into the tunnel, and then flows through this tail race to the lower river and gorge. It is diverted from the main stream but a very few minutes, but in that time it serves to aid man in gaining control of thousands of electrical horse-power.

It is agreed between the power companies and the commissioners of Victoria Park that all power generated in the park limits must be transmitted outside the park boundaries for application and use, and so the electric current from the station referred to will pass to a transformer station not far distant, where, for transmission purposes, it will have its voltage raised to 40,000 or 60,000 volts, in order that it may successfully and economically be sent to Toronto and other distant places to meet the demand for electric power from Niagara. Toronto has long been anxious to be connected by a transmission line with the power development at the falls, and now a line for transmission purposes has been about completed, so that electric current from the generators in the station of the Canadian Niagara Power Company may be used in the

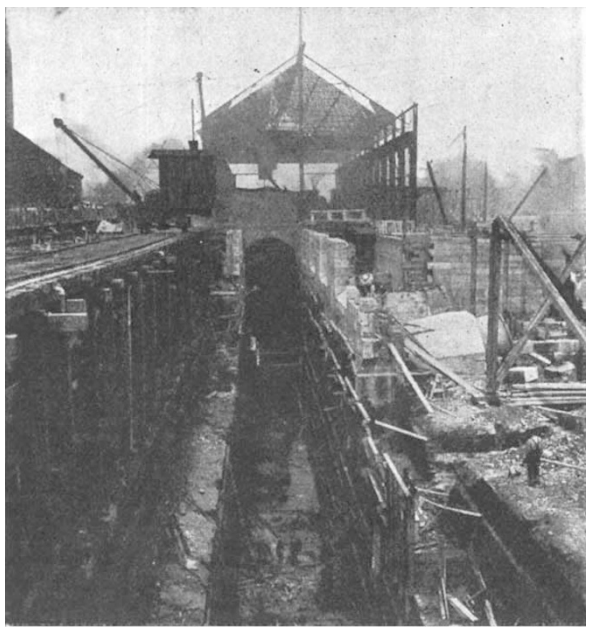

FIG. 2.—Power House of Canadian Niagara Power Co., being erected over the wheel-pit.

operation of the trolley cars and lighting systems of the Canadian city nearly 90 miles away from Niagara.

The Electrical Development Company of Ontario, Ltd., is also constructing a wheel-pit and tunnel power development in Victoria Park. The works of this company will be a short distance above the site of the development of the Canadian Niagara Power Company, but, for all this, the tunnel it is building will be slightly shorter than the tunnel of the company last named, because it will run right under the river-bed, over which the upper rapids toss, to a point behind the falling sheet of water of the Horseshoe Fall, where it will empty into the lower river. From the bottom of this wheel-pit there will be two short lateral tunnels that will carry the water from the pit to the main tunnel at a point 165 feet from the bottom of the slot. This company projects a development of about 125,000 horse-power, and the machinery it will instal will command general attention.

The Ontario Power Company is another concern that has secured a franchise for the development of power in Victoria Park. Its method of development will be quite different from that of the other two companies referred to. Its power house, a concrete and iron structure, has been built at the water's edge, in the gorge, a short distance below the Horseshoe Fall, and water will be carried to it by penstocks concealed from view in tunnels that have been driven through the rocky bank from a spillway or open relief on top of the bank. From this spillway great steel flumes will extend to the forebays, which are situated far up the river. There will be three of these steel flumes, each 18 feet in diameter and more than 6000 feet long. Each will divert 3900 cubic feet of water every second, which is an amount estimated to be sufficient to develop 60,000 electrical horse-power in the station at the water's edge. Thus from the three steel flumes and the water supply thus afforded, no less than 180,000 horse-power is to be developed. This power will pass from the generators to a transformer station located on the bluff in the rear of Victoria Park more than 250 feet above the power house, and more than 550 feet back from it.

ORRIN. E. DUNLAP.

INVESTIGATION OF THE UPPER AIR.

THE subjoined announcement has been received from the director of the Meteorological Office.

In response to representations from various quarters, the Meteorological Committee has assigned from the Parliamentary grant under its control a sum for promoting the investigation of the upper air by kites and other means.

The immediate objects in view are:—(1) To establish an experimental station where kite ascents and other experimental investigations can be carried out, especially on the days selected for international cooperation. (2) To develop and extend the instrumental equipment, so that facilities may be afforded for the cooperation of other observers upon sea or land. (3) To provide for the publication of the observations in combination with those of other countries, by a contribution to the cost of the international publication undertaken by the president of the International Commission for Scientific Aërostation, Prof. H. Hergesell, of Strassburg.

Mr. W. H. Dines, F.R.S., has undertaken the direction of the operations for the Meteorological Office. His experiments for the office are carried on at his house at Oxshott.

An endeavour will be made, with fair prospect of success, to enlist the cooperation of marine observers in correspondence with the office. Captain A. Simpson, of the S.S. *Moravian*, has already expressed his willingness to make a trial of this method of extending our knowledge of marine meteorology as soon as the necessary gear and instruments can be supplied.

It is hoped that through the assistance of others who are interested in such investigations, and have at their disposal the means of carrying them out, an effective scheme for the investigation of the upper air may be set on foot. Lieut.-Colonel J. E. Capper, C.B., R.E., of the Aldershot Balloon Companies, has already facilities for such purposes, and will take part; Mr. G. C. Simpson, lecturer in meteorology in the University of Manchester, is making arrangements for occasional observations on the Derbyshire hills; Mr. C. J. P. Cave, who has already made some interesting kite ascents in Barbados, has provided himself with the necessary equipment for experiments at Ditcham Park; and Mr. S. H. R. Salmon has arranged a station on the Downs near Brighton, and carries out ascents on the international days.

There is, accordingly, a prospect of an effective investigation being commenced.

BOTANY AT THE BRITISH ASSOCIATION.

THE president, Mr. Harold Wager, F.R.S., dealt in his address, which was delivered at Johannesburg, with some problems of cell structure and physiology. The text of this address has already appeared (September 21) in NATURE.

As was to be expected, there were fewer papers than usual this year in Section K, and of these relatively few were of a purely technical nature, the majority being either general accounts of recent work or else papers which possessed some special local interest.

General Papers.—Prof. R. W. Phillips opened the pro-