

## EUROPEAN HYDRO-ELECTRIC DEVELOPMENT

### LATEST ITALIAN PLANTS IN VICINITY OF MILAN.

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The city of Milan—the electrical city of Central Europe—is daily making fresh demands for electric power. This increasing demand has of late years been far ahead of the actual supply, with the result that the electric companies in the field are using every means to increase their output, are constantly seeking methods of extension and are, as well, exploiting new hydro-developments.

The general situation in Milan with regard to the supply and demand for electric current has already been described in a previous article. While the lighting and traction demands are increasing at a rapid rate, the greatest activity exists in the market for mixed motor load for manufacturing purposes. As previously outlined, not only have the parent electric companies built new generating works adjacent to the pioneer stations at Paderno and Vizzola, but new groups of stations have been constructed by an independent company whose interests are, however, closely allied with those of Paderno.

The new company, the "Societa Conti per Imprese Elettriche" so called from the name of its energetic founder, Signor Ettore Conti placed in operation in January, 1906, one of its most modern plants, situated at Vigevano, 20 miles west of Milan. The original Paderno company, the "Societa Italiana Edison di Eletticit " has also placed in operation (April last) a second station, located at Trezzo, about 15 miles east of Milan. These two stations, the

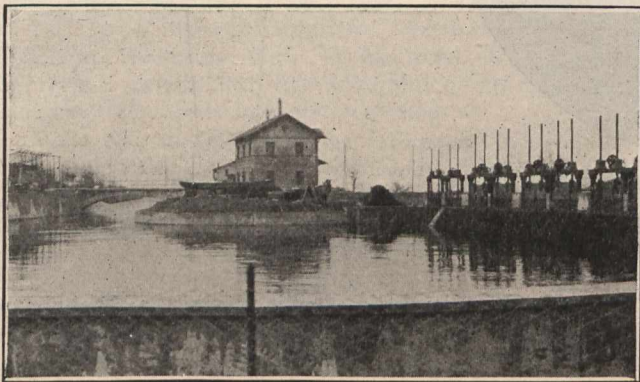


Fig. 2.—Vigevano, Exterior of Generating Station.

newest additions to the Milan group, are described below, because they illustrate the latest types adopted by Italian engineers: hence, should be of general interest.

#### Vigevano on the Tessin.

The vicinity of Vigevano is not exactly one in which a hydraulic installation would be expected, as it is well down in the plain of Lombardy. The Tessin River, however, sweeping down from the Alps, winds through the country between great gravel banks, and has a very considerable fall. It has, for several centuries, paid toll to the millers along its course, and it is an interesting study in hydraulic evolution to examine the many ingenious water-motors of 20 and 30 H.P. built by the descendants of Leonardo da Vinci. It was in this region, and further north of Milan, that this great engineer and painter labored four centuries ago. "Labor" is a suitable word as applied to the old "Master," because even as an artist alone, he evidently had a tremendous capacity for hard work. Recently new light has been thrown on his work by the discovery in Milan, of many documents, sketches and papers, which show him to have been the rival of Michael Angelo in constructive activity and ability. It can now be said, that Leonardo da Vinci was the father of hydraulic engineering, just as Volta was the father of electricity.

A pleasing incident in this connection occurred at Glasgow on July 2nd last, on the occasion of the visit of the foreign electrical engineers, as the guests of the Institution

of Electrical Engineers. The Italian section, consisting of forty members, headed by Signor Semenza, of Milan, presented Lord Kelvin with two ponderous volumes of photographs of sketches and notes made by Leonardo da Vinci. There were upwards of 1,500 photos, each about quarto size, made from the leaves of Leonardo's note books, etc., found two years ago in an attic in Milan; fortunately in a good state of preservation, after 400 years. An examination of these sketches reveals some remarkable things concerning the engineering of those days; particularly in con-

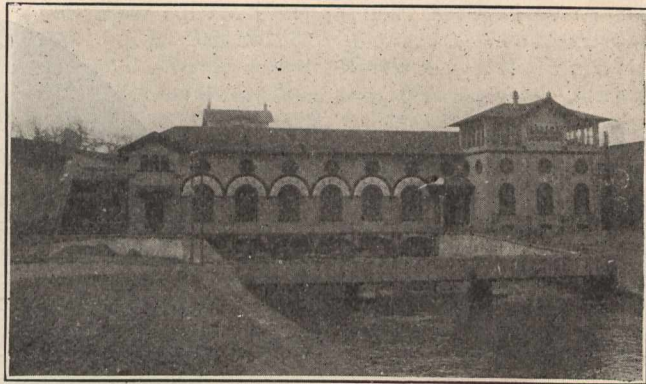


Fig. 2.—Vigevano, Exterior of Generating Station.

nection with the canals for navigation and irrigation in Lombardy, upon which Leonardo was engaged for many years. His work in many instances stands to this day, and is still in operation. His applications of water-power by rude impulse and even reaction wheels are most ingenious, and it will be of special interest to Canadians to learn that he is now credited with being the first designer and constructor of locks on navigation canals.

To return to the Vigevano plant, it may be said to be designed in a manner generally similar to that at Vizzola, already described. The water is taken from the river about 3 miles above the station, and is brought down in a canal cut in the side hill of the river bank, which in itself is a large engineering proposition. The formation width of the canal bed is 15'-0", slopes 1:1, with gravel concrete lining and a depth of water of 12'-0": in embankment the outside bank is 15'-0" top width and the outside slope 1½:1, planted with small shrubs 18" apart. The velocity will be about 6'-0" per second. At intervals, overflow weirs and sluices are placed for regulation. On one of the latter an interesting work worthy of note was seen, consisting of an aqueduct 24'-0" span across another canal, with an interior section of 36" width, and 28" depth: this was of granite

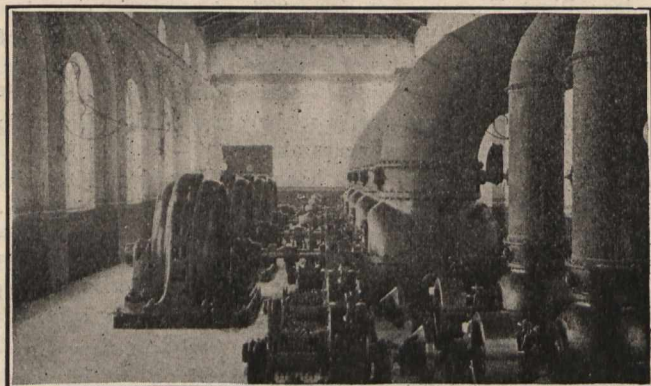


Fig. 3.—Vigevano, Interior of Station.

and each side consisted of one slab of granite 12" wide, 36" deep and 28'-0" long, set on edge; the bottom of the waterway being formed of 4" slabs.

The canal terminates in a forebay, having 12'-0" depth of water with an overflow weir on the side opposite the en-