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## MODERN USES OF THE WINDMILL.

IN this hurly-burly age we do not give much concern to the history of the past. The mill, we are given to say, cannot grind with the water that is past, and we deal with most affairs of life on this principle. The ever-living present is with us on all occasions and it is the things of the present that chiefly engage our attention. Illustrations are not few, however, that show the importance that may be profitably attached to a study of the past. To-day is only a step that we had not taken yesterday, and to-morrow, when it arrives, will leave to-day in the past. Everything has at some time existed in embryo. Of the progress of plant life, animal life, mechanism, even that creature man, this is true.

In an age when the wondrous powers of electricity are becoming more wonderful every day few have any other thought of the windmill than of a very primitive method of creating power that has long since become obsolete. But the windmill has done much for the past and as we shall have occasion to point out further in these remarks, it has a future.

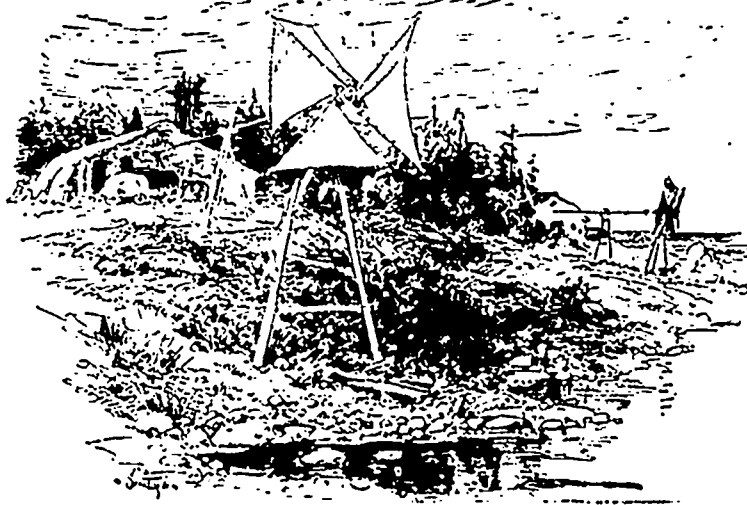
"The windmill," remarks Mr. Robert H. Thurston in an article in the *Engineering News*, "has helped to make a nation, has aided in the construction of the foundations of prosperity of more than one great country, and has lent picturesqueness to many a landscape which has a more serious interest for the historian and the statesman than for the artist. The "Rise of the Dutch Republic" was due to it, and the wonderful wealth and prosperity of that remarkable people came hardly less through the operation of windmills than through the exertion of their talent for commerce and manufactures. The Holland of the Middle Ages, comprised within an area of millions of acres captured from the fields of ocean and preserved against the assaults of the sea—by windmills. Without the windmill, there would have been neither country nor people to set such example to the rising nations. During the last fifty years or more this wonderful race has continued its "impoldering," and has ravished from the ocean nearly a thousand square miles of territory per year, and it has held it, largely by the aid of windmills."

In many parts of the world, as we approach the dawn of another century the windmill is an important factor in material progress. Mr. Thurston says. "Throughout Europe the windmill is still in extensive use, especially in the low countries adjacent to the mouth of the Rhine, where the writer once counted, from the car window, as the train swept rapidly across the fens, seventeen in sight at one time. In the United States, also, these inexpensive "prime motors" are used in immense numbers, especially for raising water and the minor tasks of the country-districts. Mr. Alfred R. Wolff, in his excellent treatise on this subject published several years ago, gave the number which had been manufactured in a single city as above 5,000, and stated that there were hundreds of thousands in operation in this country, doing many kinds of work that may, without serious loss, be performed intermittently, such as pumping and storing water, and grinding grain on a small scale in rural districts.

"It is not known when the windmill was first invented. It is claimed by some early writers that it was known to the ancients, but it certainly was not mentioned in the famous work of Hero, in which the first steam engine is described as made two thousand years ago—the prototype of the modern steam turbine—and in which is

illustrated the steam fountain, the progenitor of all the steam engines, so-called, up to the time of Newcomen. Beckmann points to the fact that windmills were not mentioned by such observing and minute chroniclers as Vitruvius, Seneca and Chrysostom. They were used in Northern Europe at the very commencement of the Middle Ages, and probably some time before. The first of the Dutch mills seem to have been mounted on floats, so that they might be turned to the wind and adjusted as required. Later, and especially in Germany, mills were mounted on posts, upon which they could swivel, and still later Dutch mills were built like those employed by our own fathers and grandfathers in America, with a movable top, which could be turned toward and away from the wind as desired, carrying the sails and shaft with it, turning about its central spindle, through which the motion of the machinery of transmission was carried down into the mill below.

"There are, according to Mr. Wolff, two principal modern types in successful use, with a number of less well known variations upon the standard constructions. These two classes are the "side-vane" and the centrifugal



WINDMILL USED FOR THRESHING GRAIN.

[This mill is on the St. Lawrence River between Pt. Levi and Riviere du Loup. Wheel and sails can be turned in any direction to suit the wind. Power is transmitted along the shaft (the direction of which is stationary) by means of a universal joint.]

governor mills. The first had its vanes set permanently at their best angles for the best states of the weather, while their positions relatively to the thread of the current is determined by a "side-vane" which relieves the pressure of the wind in such a manner as to throw the whole wheel around and away from the wind, if that should become too strong. In the other form, the blades are pivoted on axes running lengthwise, and are turned, as their speed varies, by a governor, in such manner as to have, at every instant, just that inclination to the wind which will give the desired speed of rotation. In moderate winds they are held at an angle of 60 to 80 degrees with the wind; in very high winds they fall almost into the line of its motion. Of these one is a simple and peculiarly durable machine; the other excels somewhat in excellence of regulation, though costing more for wear and tear. As compared with the steam engine and other heat motors, the power of the wind mill is small and its volume large, but it is the most economical of all known motors for many locations, and, in the aggregate, it is doing an enormous amount of work for the world, and is destined to do vastly more, we may be sure, in the future."

A modern use of wind power, the development of which we are likely to hear more of in the future is that

proposed by Sir William Thompson years ago—its employment to store electric energy in "storage batteries," intermittently working with the variable winds, laying in a stock of energy to be afterward regularly and steadily given out in supplying light and power, and possibly heat as well—in short, for all the thousand-and-one purposes to which electricity is constantly finding application. For such work the fitfulness of the winds is a matter of little importance, and their variable efforts employed night and day, yield, later, a large and inexpensive store of power for transportation, as may be found desirable, and which may find use in every operation of the home and farm, or of the small industries of the cities.

## TIMBER LIMIT SALES.

THE sale of timber limits of the Muskoka Mill and Lumber Company, which took place in the rotunda of the Board of Trade, Toronto, on April 25th, brought together a large number of representative lumbermen from various parts of Ontario, Michigan and other lumber centres. Prominent among those present were T. Bliss, A. P. Bliss, Maurice Quinn, T. W. Howry, Fred H. Howry, D. J. White, Jr., C. W. Wells, of Saginaw, Mich.; S. O. Fisher, West Bay City; Jas. T. Hurst, Wyandotte; A. Maltby, Bay City; C. A. McCool, Cantier; J. D. Shier and A. McLeod, Bracebridge; Mickle and Dymont, Barrie; John Waldie, Jas. Scott, Robert Laidlaw, and many others of Toronto.

Mr. Peter Ryan, who conducted the recent Ontario Government sale with so great success, was auctioneer, but his persuasive wielding of the hammer failed to magnetize intending buyers into buying. In the *LUMBERMAN* editorial pages is discussed what would seem to be some of the reasons for the apparent unsuccess of the sale.

The sales effected were as follows:

Robert Laidlaw, Toronto; berth 5, Wood, 2½ square miles, at \$6,600 per square mile, \$16,500.

Robert Laidlaw, Toronto; berth 4, Medora, 5 square miles, at \$2,200 per square mile, \$11,000.

J. D. Shier, Bracebridge; berth 3, Medora, 17 square miles, at \$1,500 per square mile, \$25,000.

Mickle, Dymont & Son, berth 1, Medora, 4 square miles, at \$350 per square mile, \$1,400.

The berths offered in Algoma were all withdrawn, the reserve bids not being reached. Berth 137, 36 square miles, was withdrawn at \$5,100 dollars per square mile, \$183,600. Berth 82, 36 square miles, was withdrawn at \$7,300 per square mile, \$262,800. The total properties sold represented the sum of \$54,400.

The sale of limits of Mr. Alex. Fraser, of Westmeath, conducted by Messrs. Dickson & Townsend, at their rooms, Manning Arcade, on Thursday, April 27th, like the sale of the previous Tuesday, fell flat. The highest bid reached was for berth No. 5, Paterson, 25½ square miles, \$3,550 per square mile was the amount, and the Charles Beck Manufacturing Co., of Penetang, the bidders. The properties were all withdrawn.

## TO BE SYNDICATED.

Mr. E. W. Rathbun, of Deseronto and John Bell, Q.C., Belleville, are now on their way to London, England, to conclude the transfer of the big Rathbun interest at Deseronto to an English syndicate—mills, railroads, timber limits, and all the other flourishing industries built up by the Rathbuns on the Bay of Quinte.