

Wind Power and the Generation of Electricity

It is not the purpose of this book to chronicle the development of wind-powered electric generation, but a brief look at this use of wind power helps to place the windmills for water pumping and mechanical power production into their proper historical perspective. At least as early as the 1860's proposals were aired suggesting the use of windmills to generate electricity, although Sir William Thomson, a British physicist and electrician, generally is credited with first proposing their use to charge batteries for the storage of electrical power.¹

By the late 1880's and 1890's there were already several small-scale wind-powered electricity generating plants that builders had erected for experimental and sometimes for utilitarian purposes. Among the experimenters were Joseph J. Feely of Walpole, Massachusetts, and George E. McQuesten of Marblehead Neck, Massachusetts, while an early user of wind-generated electrical power for

practical purposes was an insane asylum in New Brunswick, New Jersey.²

The most prominent of the pioneer American experimenters with wind-powered generation of electricity was Charles F. Brush, of Cleveland, Ohio, who about 1890 erected a huge windmill for his personal tests and to light his fashionable mansion. Brush's installation was most imposing. His mill itself was a combination of a European-style post mill with an American Eclipse-type mill. It bore a fifty-six-foot wheel with a total surface area of eighteen hundred square feet, a sixty-foot-long hinged vane, and a prominent side governor vane. Within the enclosed tower of the huge mill Brush installed his generating equipment, which produced current that charged 408 secondary battery cells in the basement of his residence. The estate was furnished with 350 incandescent light bulbs, about a hundred of which were in everyday use, as well as arc lights

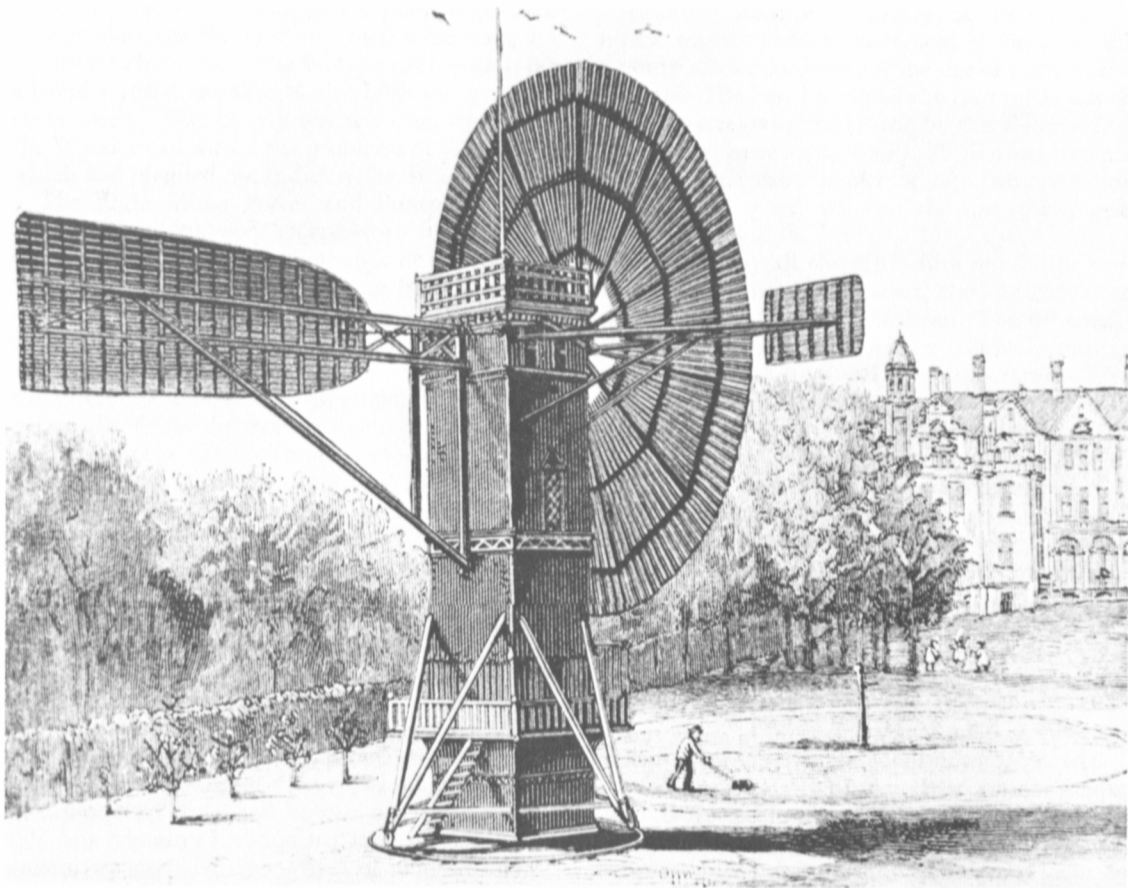
and various electric motors.³

Americans were by no means the only people interested in the use of wind power to generate electricity. Probably even more interest was shown in the subject in Europe than here. Such prominent engineers as Poul LaCour in Denmark⁴ and Hermann Honnef in Germany⁵ led the experimental field for many years, and already by the turn of the century one could find scattered across Europe factories, lighthouses, and institutions lighted and powered by electricity generated from the wind.⁶

During the early years of this century, American attention turned mostly to small-scale wind-powered electric generation. Although as early as the 1890's the Eclipse windmill had been sold commercially for the generation of electricity,⁷ the great growth in interest came with the introduction of radios and small electric lighting plants for homes and farms after World War I. With a small wind-powered

system and storage batteries, one not only could have lighting without kerosene lamps but also could be entertained by voices and even music emanating from the wireless. A number of the established windmill manufacturers attempted to modify their turbine-wheel mills to generate electricity, but most of them discovered that the traditional wheels turned

too slowly to operate the generators satisfactorily.⁸ Together with a great many other makers of wind electric generators, they switched to fast-spinning two- and three-bladed generators which remained in common use from the 1920's until the communities and rural areas they served were reached by the power lines of the electric cooperatives



Charles F. Brush's huge experimental electricity-generating windmill, which stood at Cleveland, Ohio, in the 1890's. From *Scientific American*, LXIII, No. 25 (20 December 1890): 383.