



No. 552: [\[Click here for audio of Episode 552.\]](#)
OLD WIND AND ELECTRICITY

[by John H. Lienhard](#)

Today, an engineer is a century ahead of his time. The University of Houston's College of Engineering presents this series about the machines that make our civilization run, and the people whose ingenuity created them.

A hint of graininess warns that this photo is a century old. The setting is a spacious field with mansions in the background. It's an upscale neighborhood in Cleveland, Ohio -- 1888.

But the foreground! It looks like science fiction. Sitting on a concrete pad is a giant windmill. The 40-ton tower that holds it is 60 feet tall. The great wheel has 140 blades.

What can this be? Well, it's a domestic electric generator. It's what many Americans only think about making today, as fuel becomes more precious.

The builder was Charles Brush. Years before, he'd given the valedictory address at Cleveland High School. He spoke on "The Conservation of Force." In that talk, he traced the sun's energy through plant life, coal and oil, steam, power, and light. After that, he'd gone on to study engineering.

By 1880 he'd become wealthy by creating an arc lighting system for Cleveland. That was the very modern form of electric lighting before Edison.

In the early 1880s Brush went back to the cycle of energy from the sun. How do you best capture the sun's energy and hold it? His answer was to take energy from the wind and store it in electric batteries. So he began work on this great windmill.

The huge slow-moving blades drove a 50-to-1 gear train. It turned an electric dynamo. The dynamo, in turn, fed 400 battery cells.

They powered 350 incandescent lamps in Brush's mansion.

They also supplied various arc lights and electric motors.

It was hardly a system that John Q. Citizen would go out to buy for his home. It didn't just take more money than most of us see in a lifetime. It also took Brush's enormous expertise to build and run it.

But run it did. For 20 years it supplied power flawlessly. Of course, toward the end, the city of Cleveland was selling cheap electricity. Brush used more and more public power until, in 1908, he quit using the windmill. After that it fell into disrepair and finally into ruin.

But, for a time, Brush had created visionary high-technology in his back yard. He'd set up a capital cost vs. running cost equation that we're still trying to solve.

Maybe, one day, we shall learn to make cheap generators and storage batteries. Maybe we shall refine propellers to take more power from the breezes. Maybe we'll yet have windmills in our back yards. Maybe, one day, Brush will look down from that great empyrean powerhouse in the sky and smile. For everything that is old shall be new again.

I'm John Lienhard, at the University of Houston, where we're interested in the way inventive minds work.

(Theme music)

