

Muddy Hands

Soil and Water Information for Educators Brought to You by the Lake and Geauga County Soil and Water Conservation Districts



History Flowing By

There is much written on the natural history of our rivers and streams. People study the insects, the fish, and the salamanders. They watch for the birds to stop by each season. But sometimes, as the stream rearranges its banks, the human history gets washed away, remembered only in a name, if at all. Much of the history of Ohio and the United States was shaped by water. Rivers and lakes were an early highway system because it was much easier to paddle upstream than to follow a deer trail through dense woods and swamps. Rivers were also a source of energy, and gave early settlers a chance to harness gravity to do work. This issue of Muddy Hands explores the historical legacy of our local waterways.

What's in a name

The early explorers came by boat, so it was only natural that they stayed in their boats whenever possible. Larger rivers and lakes were great conduits for moving people and supplies. The explorers and voyagers left behind names such as Presque Isle ('almost an island' in French), and both Portage County and the Portage River, in western Ohio. (A portage is the process of carrying a boat and its contents around a rapid or other obstacle.)

Water that wasn't named during exploration usually picked up a name quickly once an area was settled. Many descriptive terms came to be stream names, such as East Creek, Red Creek, Caves Creek or Marsh Creek. Some Native American names were kept by the European settlers, including many of the major watersheds in Ohio (The Ohio River itself, along with the Cuyahoga, Scioto, Mohican, and many others). Other place names tell a longer story.

Locally, much of the early settlement history lingers in the place names. For an example, look at part of the Grand River watershed. Paine Creek slides around Indian Point, and empties into the Grand. Indian Point, now a Lake Metropark, was at several times in history a Native American village site. It had also been a boy's military camp, and a hunting camp in its more recent history. Lake Metroparks acquired the property from the Phelps family in 1964. (Portions of the property had been in the Phelps family since the area was first surveyed.) The name Phelps still appears nearby on the map. Phelps Creek runs through Leroy Township and drains into Paine Creek. Hendrick Elsworth Paine married a member of the Phelps family, and they lived in Paine's Hollow, where they

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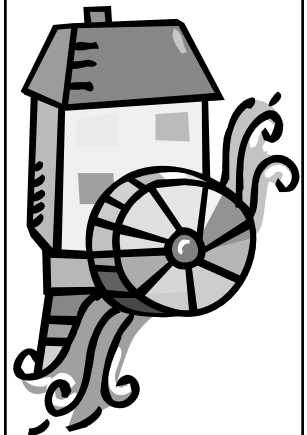
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*Down by the old mill stream,
Where I first met you,
With your eyes of blue,
Dressed in gingham, too;
It was then I knew,
That you loved me, too;
You were sixteen,
My village queen,
Down by the old mill stream.*

-Tell Taylor, Ohio native

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Harnessing Gravity on the Frontier

In nearly every historical account of early settlement in Geauga County, two factors stand out as being important in attracting our first settlers. First was the fertility of the soil, followed by "a suitable mill site." This suitable mill site usually meant a large creek or river headwaters that had a steady, reliable source of water with enough 'drop' or head to power a water wheel. The water wheels drove the early lumber sawmills and flour (grist) mills. Many of these mills served multiple functions. Along with or following their early use for cutting lumber and grinding corn, wheat, and other cereal grains into flour, many had a second life as a tannery, a woolen processing mill, or a distillery.

If you browse through the 1880 publication of the Pioneer and General History of Geauga County you can find an interesting history of each township's use of their water resources. Bainbridge, for instance, had numerous mills, including General Joseph Eggleston's 1820 sawmill (1821 grist mill) on the north bank of the Chagrin

River, south of present day Pettibone Road. The mill changed hands, and in 1826 a distillery making "high wines and whiskey" opened over the mill race next to the grist mill. Records were apparently written in charcoal on the rough-sawn boards of the building and included such gems as "A. To 2 gallons of wiskey: N.S., 1 galon wiskey," and "Wiskey for sail; 37 sents." One didn't need to be an expert at spelling and grammar to run a business in those early days. Whiskey production was a great way to convert surplus corn into cash. Since interstate commerce was slow and unreliable, especially on land routes, bulk goods were not easily exported. Barrels of whiskey could be shipped on boats without concern of mold or infestation, and were valuable enough to turn a profit when sold back east. Even so, if you read closely, you will find that the mill owner in Bainbridge "failed financially" after a few years, and sold the business back to General Eggleston.

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operated a grist mill. (H. E. Paine was a descendent of General Edward Paine, most likely the individual after which Paine Creek was named.) Even though many of the people are long gone, their legacy still appears on every road map of the county.

Sometimes a name stays on, even after it has been altered elsewhere. In Madison Township, Dock Road runs north from US 20, along Arcola Creek. Cunningham Road runs east off of Dock, over to the county line, crossing the main stem of Arcola Creek along the way. These are all historical names from the waterway they surround. The area at the mouth of the creek was originally called Madison Dock. Hence Dock Road, the road that went to the dock. Much of the land in this

area was sold to Captain John Cunningham. The creek became known as Cunningham Creek, and the road crossing the stream bore its name. Cunningham later sold 50 acres to the Erie Furnace Company, who started a bog ore furnace which came to be known as the Arcole Furnace. Arcola was the name that was applied to the stream when it was registered by the United States Geological Survey, and the park that sits at the mouth took the same name.

Kids (and adults too) sometimes see history as something that happened long ago and far away. They travel to Gettysburg or Washington D.C. or the Alamo to see 'Historical Places'. But with a little curiosity about your immediate surroundings, you might just find history flowing around you.

For more information on the history of your community, contact your local SWCD or historical society.



Micro-Hydro: Make your own hydroelectric generator!

In many parts of the world, dams have been constructed to generate electricity. This simple project will create a faucet-powered generator for a classroom demonstration. Make sure to use all equipment safely and according to their directions. You will need to construct a stator, a rotor, a turbine, then assemble them into a working model. The templates and detailed directions can be downloaded from <http://www.re-energy.ca/pdf/cp2.pdf>.

You will need:

- Rectangular jug (windshield washer fluid or similar)
- 8 plastic spoons
- 1 large cork (1-2" diameter)
- 100m of enameled magnet wire
- Foamcore or heavy cardboard
- 1/4" diameter wooden dowel, 8" long
- 4 ceramic or rare earth magnets (18mm or larger)
- Clear vinyl tubing (3" long, 1/4" inside diameter)
- 4 brass paper fasteners (brads)
- Paper templates downloaded from http://www.re-energy.ca/pdf/microhydro_template.pdf

A turbine is a form of rotary engine that converts fluid flow to work or electricity. The fluid can be steam, water, or wind. The major parts of a turbine are the stator, which is stationary, and the rotor, which turns. In this model, both are made from foamcore.

Electricity is generated by passing a magnet across coils of copper wire. The magnet causes electrons to move along the wire, creating a current. In this model, the rare-earth magnets are attached to the rotor. As the rotor is turned, the magnets spin past coils of wire on the stator. Pay attention to the polarity of the magnets, and the direction of the coils as indicated on the templates.

Many different styles of water wheels have been developed over the years. Early wheels had flat blades, but as people looked for more efficient ways to generate power, they tried curves, cups, and propeller-style wheels. This model uses plastic spoons as blades,

similar to a Pelton Wheel. These are the type of water wheels that first powered the factories of the Industrial Revolution. Henry Ford constructed many of them throughout lower Michigan.

To build your micro-hydro, follow the web instructions for building the stator, turbine, and rotor. A dowel suspends the turbine in the center of the container. The stator attaches to the outside of the container and the rotor mounts outside of the container, on the shaft, so that it spins as close to the coils as possible, without touching them.

You should now have a working micro-hydro generator. You can test it under a faucet or with another pressurized water source. With a multimeter set to read volts of alternating current, you can measure the output. This system should also power a light bulb. If you would like to try out other electricity generation methods, many of the materials can be reused to create a vertical-axis wind turbine.

Tools to have on hand:

- Drill with 1/4" bit
- Scissors
- Electrical tape
- Ruler
- Nail or awl
- Hot glue gun
- White glue
- Utility knife
- Pencil sharpener
- Permanent marker
- Magnetic compass
- Wire cutters
- Gloves
- Safety glasses
- Multimeter
- Sandpaper or emery cloth

For detailed instructions on building your own water wheel, go to <http://www.re-energy.ca/pdf/cp2.pdf>. Other projects can be found at http://www.re-energy.ca/t_renewablebasics.shtml

Gravity *(Continued from page 2)*

Burton also had numerous mills, including 8 sawmills on the various branches of the Cuyahoga River. Some of these mills had woodworking lathes, wool carding machines, and one had a cider brandy distillery. Edsen's Mill (located south of present day Route 87 and west of Bigelow Road) could be powered with walking oxen moving the turnstile when the water was low.

Rivers that were not too shallow were also used for transportation of people and produce. Geauga County's terrain and soils made many roads impassable in some seasons. More than one early settler paid their taxes by constructing roads, rather than with cash, and several paid off personal debts to others by working in their name.

One early Burton settler brought his apple trees by canoe up the Cuyahoga River and then overland to his orchard site. The hills of Geauga County still grow apple orchards, and the Geauga Historical Society makes apple butter each fall.

Though many mills have decayed into nothing but historical documents, some evidence still remains intact. If you travel to these old mill sites, some of the feeder canals and mill foundations are all that remain of a fascinating chapter of Geauga County's historic waterways. A few of the old mill houses have been converted into residential houses. A keen eye looking over foundations of older houses, and old stone walls might also pick out the occasional round stone with a square hole in the middle as the final home of a worn-out millstone.

Envirothon Event Open to All

This fall, high school students from Lake, Geauga, Ashtabula and Cuyahoga counties will be gathering at Camp Beaumont in Rock Creek for an Envirothon training event. While the purpose of the event is to prepare teams for the Northeast Ohio Envirothon in May, all area high schools are welcome to participate, whether or not they plan on competing in the spring. Several schools use this event as a field trip for their science class or environmental club. Students will work in small groups with various natural resources experts to learn about forestry, aquatics, soils, wildlife and alternative energy, the 2007 Envirothon topic. The Envirothon training event is free, and students need only bring writing supplies and their lunch. The 2007 Northeast Ohio Envirothon will be held in Cuyahoga County. For more information, contact your SWCD.

Useful Web Sites for Water History

United States Geological Survey, Geographic Names Information System: (<http://geonames.usgs.gov/pls/gnispublic>) - This web site allows you to search current and historical place names within a specific area or nationwide.

How Stuff Works, Hydroelectric Power: (<http://www.howstuffworks.com/hydropower-plant.htm>) - a great report on how gravity is converted to electricity, and an idea for generating hydroelectricity in your shoe!

Ohio's Old Mills Today: (<http://fpw.isoc.net/KREK/>) - This website discusses the history of Ohio mills, and has a quite thorough list of those that still operate. Also describes briefly the processes involved in grinding grains, pressing apples and carding wool.

Stockport Mill: (<http://www.stockportmill.com/hydro.htm>) - This Ohio inn has converted an old mill into a small-scale hydroelectric plant. They produce more electricity than they use and sell the excess to AEP.

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