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Quick, Timely Reads

Reading in the Time of Coronavirus

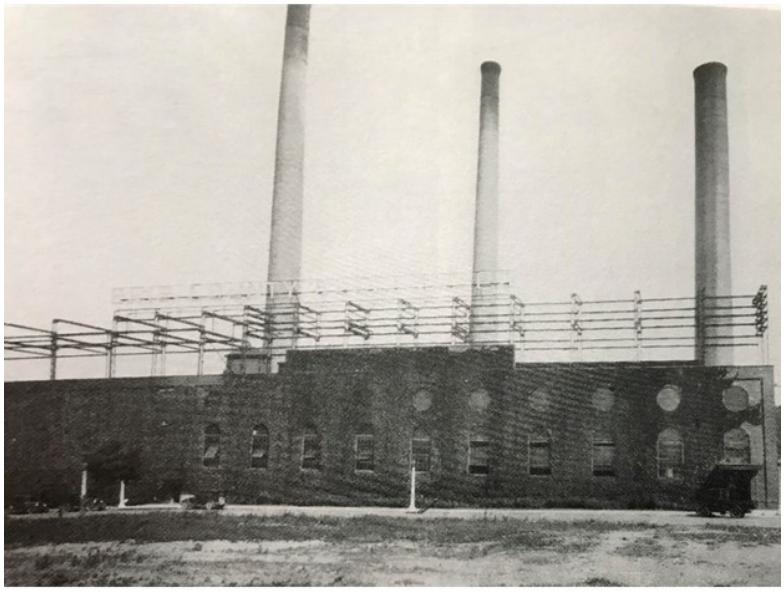
On the Waterfront

Strong's Pond: Mystery and Tragedy

By David Frew

December 2020

Dr. David Frew, a prolific writer, author, and speaker, grew up on Erie's lower west side as a proud "Bay Rat," joining neighborhood kids playing and marauding along the west bayfront. He has written for years about his beloved Presque Isle and his adventures on the Great Lakes. In a new series of articles for the Jefferson, the retired professor takes note of life in and around the water.



Strong Electric Generating Plant at West Fifth and Cranberry streets in about 1940

The most mysterious 1950s-era Erie bayfront attraction for most neighborhood kids was Strong's Pond. The pond was part of an abandoned electric generating

plant that sat deteriorating at the corner of West Fifth and Cranberry streets.

The pond was a hundred yards north of the old plant, and we knew that it was connected but we did not understand its original purpose. For us it was an exciting water hole with a spillway at the eastern end, and a ring of trees and brush surrounding its north and west edges. It was a great place to hang out once we had penetrated the eastern entry by stepping carefully along cement causeway walls that led past the pond and up into the Goosewoods. Once there we were hidden from the prying eyes of adults.

It was a great place for fishing, smoking various weed compounds in corncob pipes, and swimming. We realized that swimming was probably a bad idea, especially after rumors of the pond being hundreds of feet deep and inhabited by semi-poisonous snakes as well as snapping turtles bigger than alligators. But on hot summer days, getting wet trumped good sense.

Our bayfront water adventure land was actually an abandoned cooling spray pond intended to reduce the temperature of boilers and condensers in Erie's second electric power plant. The city's original electric generating station was at East 12th and French streets, but by the early 1900s it had more than reached capacity.

Charles Strong, owner of the Strong Mansion – today's Gannon Old Main – was president of the Erie County Electric Company and proposed that a new power plant be built on his property adjacent to his summer estate. The Strong Power Station was built in threestages, each with its own boiler and smokestack, between 1909 and 1919. It operated continually on coal until it was closed in 1944. The closure was precipitated by the growth of the Pennsylvania Electric Company, which took over all of the regional power generation and decided to close the Strong Station because it was inefficient. The huge cooling stacks, which defined the old building, were more than 100 feet tall and towered over the lower westside until the building was demolished in 1969.

As the power plant was being built, Cascade Creek was diverted via concrete dams into a large pond on the north side of the railroad tracks. To help contain the water, concrete side walls were constructed along both sides of the pond. The walls narrowed at the east end and led to a spillway, which allowed excess water to drop over a short waterfall and into Cascade Creek. There were two large water-feeder tubes running into the plant, where raw water was used to cool the boilers and condensers.

The main 36-inch pipe brought cooling water underground from Presque Isle Bay, using concrete inlets built a few hundred yards offshore and almost directly in line with Cranberry Street. A second 24-inch tube was run underground, directly from the cooling pond to the power plant.

After cooling the boilers and condensers, hot water was returned to the pond using spray nozzles positioned on the south wall of the pond. Hot spray fell into the pond and as the water level rose, overflow went over the spillway into Cascade Creek and flowed back into Presque Isle Bay. Valves were used to control the volume of water directed into the power plant from either the water inlets in the bay or the cooling pond. During winter, the hot spray dispersed into the cooling pond prevented it from freezing. As a contingency for times when Presque Isle Bay froze and the offshore inlets would not work, the 24-

inch input pipe from the cooling pond was sufficient to complete the power plant's entire cooling cycle.

By the time we had discovered Strong's Pond, the old power plant had long since been abandoned. It remained standing for years as we were using the pond, however, while civic leaders discussed potential uses for the building. The most popular idea was an almost accepted proposal to reconfigure it as a performing arts venue. Given the distaste that members of the public had for the waterfront, which was generally perceived as a frightening badland filled with sailors, pirates, railroad hobos, and other dodgy characters, each proposal to repurpose the building met with failure.

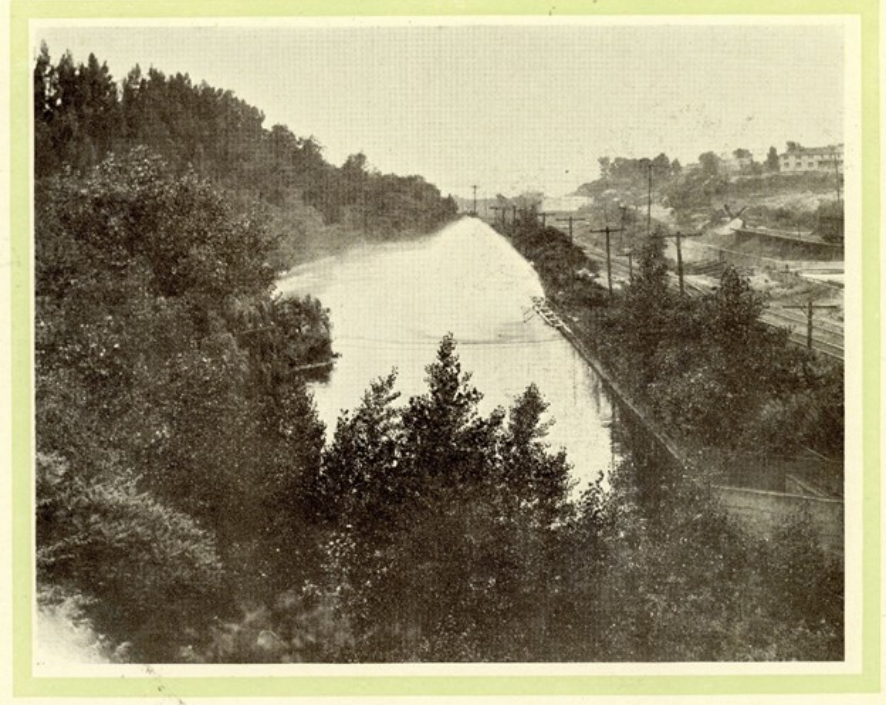
As one local politician put it, "what self-respecting citizen would be willing to attend a society function held within sight of Presque Isle Bay and the docks?" If only they could have seen what was to happen these days.

For us the overgrown pond seemed even more exciting than it had probably been when new and serving its designed purpose. Trees, brush, and vines had grown to the edges on all but the east-end spillway, making it seem like a private water hole in a jungle. The pond was literally teeming with small fish, which bit so ravenously that we could catch dozens of crappie and bluegill in a few minutes' time. We accessed it from Cranberry Street both before and after the Cascade Street connection to the docks was closed, and there were almost always lots of kids there, having fun.

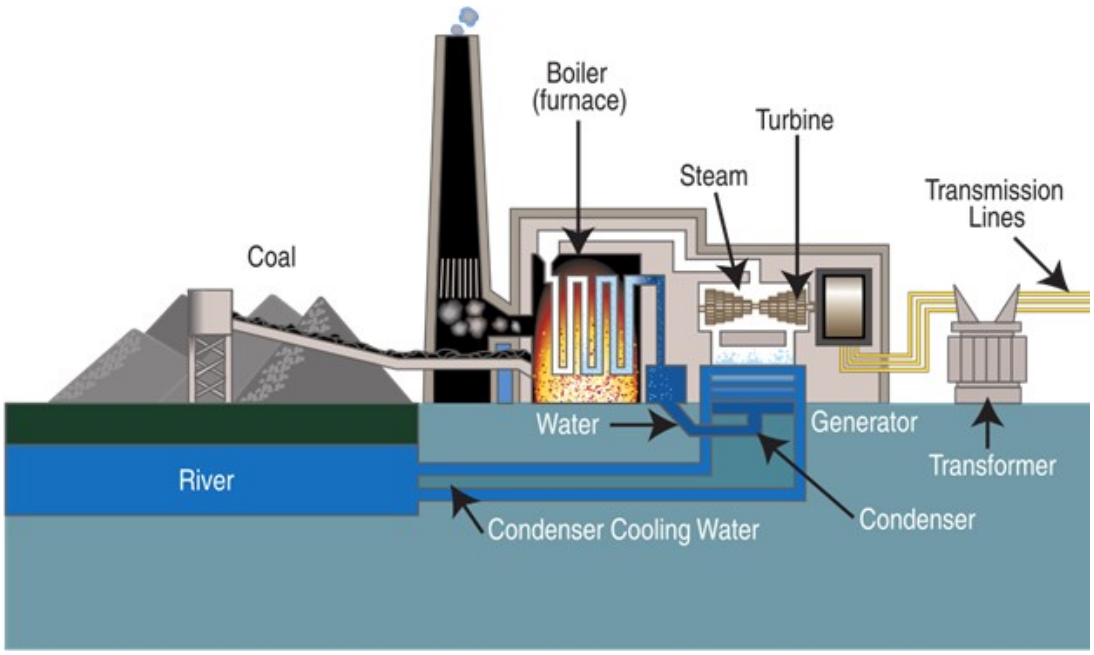
The fun continued until a very scary day in the mid-1950s. We were approaching the pond when we began to realize that something was wrong. There were more kids than usual, but as we climbed up and over the maze of concrete that led to Strong's Pond, we knew that there was trouble. Several kids stood watching an older neighborhood boy, who was a star swimmer from Strong Vincent High School. He was repeatedly diving into the pond and staying submerged for minutes at a time. Each time he returned to the surface he was exhausted and disappointed. Minutes later we heard sirens. Then adults rushed to the edge of the pond and began asking questions. They made us leave, after which they began using huge hooks and nets to drag the pond. We left but remained close enough to watch, and minutes later the emergency crew lifted a boy from the water and carried him to a waiting ambulance.

The next day we learned that the boy who had slipped below the surface of Strong's Pond had drown. He was several years older than most of us, but we all knew him. That sobering event ended our times at Strong's Pond. We all stopped going, especially as stories of how he had probably been trapped in weeds and unable to free himself began to circulate. We were finally beginning to think that our parents' warnings about the place might have been correct when the fate of the mysterious pond was settled forever.

A few weeks after the tragedy, workmen convened at the pond and demolished the retaining walls and spillway that had collected water from Cascade Creek. By the fall of that year, the creek had been rerouted to its original location. Strong's Pond was gone forever.



Strong's Pond, looking east from the old Sixth Street Viaduct. The Cascade Park Club is visible at the top of the bluff, upper right. Note the spray on the right side of the pond. (Photograph courtesy of Jerry Skrypzak)



This generalized schematic shows how cooling water is sent into and out of a relatively modern, coal-fired power plant.

The schematic above illustrates the general functioning of a coal-fired power plant. Coal is moved into a boiler, which burns the material, producing steam that is used to turn a turbine and create electricity in essentially the same way that science teachers demonstrate the creation of current by spinning a coil. Unwanted byproducts of the process are (1) effluent that is exhausted into a chimney and rises into the atmosphere and (2) heated water, discharged from the process and returned to the environment.

The 1909 Strong Station was unimaginably inefficient and dirty. To make matters worse, diverting a natural waterway to make a cooling pond would be completely

out of bounds these days. The discharge of super-heated water into an artificial pond and allowing it to spill into a creek and flow back into the bay took a terrible toll on both Cascade Creek and Presque Isle Bay as it killed everything downstream. And the effluent from the smokestacks was awful. While there were no environmental measures in those days, anyone who lived near the bayfront was aware of the stench of burning coal that permeated the neighborhood.

Modern power plants have made quantum improvements in efficiency. Cooling towers are used to dissipate heat that is drained from plants. And instead of burning raw coal, newer plants pulverize it, transforming it to a fine powder. Coal powder is injected into burners, which function like automobile combustion chambers, producing much more energy than old raw burning systems.

One of the most efficient coal-fired plants in North America was at Nanticoke, Ontario almost directly across the lake from Erie. The Nanticoke plant was North America's largest electric generating station. Operated by Ontario Hydro, a crown corporation, it was built between 1973 and 1978. At capacity it could provide almost 4,000 megawatts of electricity, 15 percent of Ontario's demand. To put that into context, the Strong Generating Station was said to have a maximum capacity of 100 megawatts.

Nanticoke's Lake Erie location provided a ready supply of cooling water as well as an efficient coal delivery port for ships. Using its own loading docks, coal was moved to the plant via automatic dockside conveyers, eliminating the need for railroad cars or trucks to bring raw material. Cooling water was circulated through the plant's heat exchanges and returned directly to Lake Erie, eliminating the need for cooling towers. A 10-degree celsius temperature change limit was established for return water.

The original business strategy at Nanticoke was to use the coal plant to provide for peak electricity demands while the bulk of Ontario's electrical needs were being produced by hydroelectric (water) or nuclear sources. When electricity was deregulated, however, the Nanticoke plant went online, full time and began to ramp up production to unanticipated levels. This created a situation in which return water, while chemically pure since it had been contained in an internal heat exchange system, began to violate the 10-degree thermal tolerances. As output temperature changes rose to as high as 12 or 13 degrees celsius, the heated water began to alter the biological balance of the lake as it prevented winter freezing and changed commercial fishing.

More environmentally threatening than the thermal pollution, however, was the volume of precipitants escaping the twin 650-foot stacks. While pollution per megawatt hour was very low at Nanticoke, the enormous increase in electrical output from the plant after deregulation caused the sulphur, nitrogen, and carbon dioxide levels, escaping the stacks, to rise to disturbing levels. Standard measures for power plants are expressed in "carbon dioxide equivalents," and by 2007 the precipitants had risen to almost 18,000 metric tons per year (1 metric ton is 1.10 U.S. tons or 2,205 pounds).

The former Nanticoke, Ontario Power Plant with its distinctive 650-foot smokestacks could be seen from the ridges south of Erie on clear days.

Although they knew that pollution levels were increasing with the over-usage, Ontario Hydro continued to operate at high levels since the electricity generated at Nanticoke was so extraordinarily inexpensive. Eventually, however, concerns over electric bills were trumped by evidence from epidemiological studies by the University of Toronto.

One of the most damaging studies, which began as a geographic investigation of cancer diagnoses in southern Ontario, suggested a disturbing trend line that identified public health issues along Lake Erie's north shore, including life expectancy and infant mortality, as well as specific disease trends. As investigators traced the incidence of organ cancers, respiratory, neurological and gastrointestinal diseases, they noted with some surprise that they seemed to peak in a semicircular band approximately 50 miles northeast of Nanticoke. Working backwards, they began to suspect that effluent from the 650-foot stacks was being carried east by Lake Erie's prevailing southwest winds and that the observed distance to the disease hotspot represented the average time that precipitation from the stacks floated along in the air before it fell to the ground (and water).

Conclusions from this study suggested that the extra high stacks, engineered in the NIMBY (not in my back yard) spirit of the 1960s, may have helped to alleviate concerns of Nanticoke residents when Ontario Hydro was proposing the plant, but that the height of the stacks had placed downwind neighbors in communities such as Dunnville, Port Colborne, Fort Erie, and Welland at risk. The 18,000 metric tons of pollutants going out of the stacks had to have been going somewhere and it was beginning to seem that mercury, arsenic, cadmium, and other nasty pollutants were being shifted downwind and downstream, infecting crops, fish, and general life for Ontario citizens east of Nanticoke.

The twin 650-foot stacks are brought down at Nanticoke.

There were criticisms of these post data-collection theories. Study investigators were reporting serendipitous results; conclusions from hypotheses that had not been part of the original study design. As well, there were methodological suggestions that before public policy should change conclusive clinical studies of human subjects needed to be completed. Some argued that there were far too many uncontrolled study variables to be able to reach such conclusions. But in 2009, the Province of Ontario announced that evidence of negative health consequences from coal-fired electricity generation was overwhelming and that they were going to phase out coal plants beginning with the most toxic facilities. Because of its sheer volume, Nanticoke was identified as one of the first to go. The designed height of the stacks at Nanticoke (mid-1960s technology) made it impossible to install scrubbers so the only realistic way to deal with the enormous volume of pollution coming from Nanticoke was to shutter the plant. Nanticoke was closed in stages with four of eight floor generators taken out of service by 2010. The plant was completely closed in 2013 with the vague hope that it might be reopened as a gas-burning facility. In 2015, however, it was announced that Nanticoke would never be reopened.

In 2018, an agreement regarding the former Ontario Hydro site was reached with the Six Nations Confederacy at Brantford Ontario. A technical committee from the tribe agreed to assume ownership of the Nanticoke property and build a solar farm if the province would remove the two enormous stacks. Lined with asbestos, the old stacks represented a potential environmental threat to the long-term success of any new venture on the property.

The Six Nations group publicly stated that converting to clean energy, while providing ongoing employment, would help support their North American mission. Since the property had once been home to displaced Nanticoke Indians (from the Chesapeake Bay area) the Iroquois began the development of the property with an anthropological survey to be sure that new construction would not obliterate ancestral remains or artifacts. The two stacks were imploded in 2018 and the main building was demolished the following year.

The new Nanticoke Solar Farm has a capacity of 44 megawatts. And that reduced capacity from 4,000 to 44 megawatts, representing one of the ongoing criticisms of Ontario's move toward sustainable energy. The old coal plant was producing inexpensive power and the shift toward renewable energy (which was larger than just the Nanticoke Plant) has increased utility bills significantly over the last decade. Ontarians, who had grown accustomed to seeing what seemed like an

innocuous plume of smoke rising from the two stacks that had dominated the landscape for decades, continue to question the tradeoff.

Solar panels were erected at the Six Nations Solar Farm, while the remains of the old power plant operating building is in the background. (Photo courtesy of the Tillsonburg News)

Apparently, the dangers that my friends and I had endured during our 1950s experience of the coal plant on the bayfront grew up with us and became even more frightening. It now seems that swimming in the old cooling pond may have been the least of our problems. We often wondered about the ubiquitous stench of burning coal that hung over the neighborhood, but we had grown accustomed to it. And the cloud of burning coal fumes that hung over the neighborhood wasn't just coming from the power plant. Most homes had coal furnaces, semi-annual coal deliveries, and basement coal bins. We were adding to the pollution generated at Fifth and Cranberry.

It now seems that the future may include dramatic reductions in the use of coal-fired electricity. Between the years 2000 and 2020 the volume of electricity generated by coal in the United States fell from 2 billion megawatts to less than a billion. As that was happening, gas-fired plants increased to 1.5 million megawatts while nuclear held steady and renewable sources (wind, solar, and hydro) rose significantly. It now seems possible that coal burning could disappear from this country within a generation. But even as the United States and Canada continue to reduce coal usage, other countries have been increasing their use. China, for example, currently uses more than five times the coal burned in the United States.

Author's note: *During the 1990s, I was in and out of the Nanticoke Generating Plant several times per year and worked with the operations staff. By any measure, the plant was astonishing in scale, beginning with the 11-story building, the massive coal delivery system, and the stacks. At peak, almost 700 people were employed there. Ontario Hydro executive Bob Osborne provided much of the information used in this article.*

ABOUT THE AUTHOR

Historian and author ***David Frew, Ph.D.****, is*

an emeritus professor at Gannon University, where he held a variety of administrative positions during a 33-year career. He is also emeritus director of the Erie County Historical Society/Hagen History Center and is president of his own management consulting business. Frew has written or co-written 35 books and more than 100 articles, cases, and papers.

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