

Geneva's Health and the Environmental Kuznets Curve

“No man's life, liberty, or property are safe while the legislature is in session.”

— Gideon J. Tucker¹

by

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“The ‘environmental Kuznets curve’ (EKC) is a hypothesized relationship between environmental degradation and GDP per capita. In the early stages of economic growth, pollution emissions and other human impacts on the environment increase, but beyond some level of GDP per capita (which varies for different indicators), the trend reverses, so that at high income levels, economic growth leads to environmental improvement. This implies that environmental impacts or emissions per capita are an inverted U-shaped function of GDP per capita.”^{2,3} The “EKC” is conceptually derived from the original Kuznets postulate regarding economic inequality generally.⁴ Once viewed as almost an economic law of nature, this economic model has been historically more highly regarded than it is today, though it has not been completely rejected.

Have all Geneva neighborhoods “gone over the top” of the parabolic Kuznets curve so that Geneva’s economic development now drives environmental improvement equally throughout the City and Township? Or do examples exist where “new development” still produces a net degradation of the environment, or, at best, no improvement? The evidence is ambiguous. Geneva’s history shows that the largest environmental threat (un-affectionally dubbed “Mount Trashmore” by its neighbors), by sheer size at least, sits right where the poorest Genevans once resided. There may still be a “poor side of town.”

I first came across the EKC idea three decades ago as a cancer doctor and amateur environmentalist. Remember that in the 1980’s environmental causes were blamed for about 80% of human malignancies.⁵ Like the Kuznets Curve, this view has also become less dominant in recent years with the discovery of such things as cancer-causing genes and the changed environmental focus on global climate change, but Kuznets has not been abandoned. Once, just like in the case of politics, it could be said “all pollution is local”.⁶ The kind of both politics and pollution that can harm a Genevan both remain local. The large mountain remains but scores of smaller sites in Geneva remain as potential threats. Insidiously, these small sites, old and new, are difficult to track individually. More difficult still is to determine the sum of their aggregate threats.

¹ Gideon J. Tucker, *Final Accounting in the Estate of A.B.*, 1 Tucker 248 (N.Y. Surr. 1866). This was a parody of the Magna Carta, which guaranteed due process of law in England in 1215.

² Wikipedia contributors, “Kuznets curve,” Wikipedia, The Free Encyclopedia, https://en.wikipedia.org/w/index.php?title=Kuznets_curve&oldid=888133883 (accessed March 17, 2019).

³ Grossman, G. M., & Krueger, A. B. (1991). Environmental impacts of a North American Free Trade Agreement. National Bureau of Economic Research Working Paper 3914, NBER, Cambridge MA.

⁴ Kuznets, S. “Economic growth and income inequality.” *American Economic Review*, 49 (1955), p1-28.

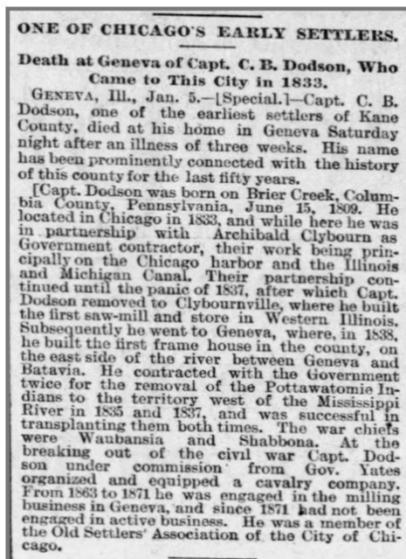
⁵ Steingraber S. *Living downstream: an ecologist looks at cancer and the environment*. Reading, MA: Addison-Wesley Publishing Company, Inc.; 1997.

⁶ The axiom “The Solution to Pollution is Dilution” stems from the observation that if one lives far enough from the source, whether it be Chernobyl or a Superfund Site, one was safe. However, some hazards, like lead, are far more distributed, albeit not uniformly.

Heavy metals and sub 2.5-micron particles from fireworks and backyard fires, organochlorines from old hospital incinerators, chemicals from dry cleaners, diesel fumes from the roads and rails, petrochemicals from old gas and oil tanks, agricultural pesticides and herbicides, assorted remnants of old blacksmith shops, tanneries, stills, foundries, paper mills, and manufacturing sites all contribute relatively small threats individually. The resultant “soup” varies by neighborhood. Little bits of lead come from a multitude of sources, particularly imperiling Geneva’s smallest children.

When I looked around Geneva in 1980’s, I was struck by the fact that the south-east quadrant of Geneva Township contained two large regional landfills. One was of “modern” (1980’s) design and one had been basically an open pit⁷ that received refuse in the 60’s before the hazardous industrial waste stream was separated from the commercial/residential stream and before environmental regulations were put in place. The City of Geneva sat back while the County of Kane agreed to repeatedly expand its “Enterprise Fund” cash generator (Settlers Hill). After the last expansion the dump could have, if unchecked, continue to operate until 2021.⁸ Who were the earlier Geneva neighbors who initially let this happen so close to their residences and without a whimper?

The neighbors were almost exclusively, at various times, the inmates of the Kane County Jail, the Kane County Poor Farm, and the Geneva Industrial School for Girls. (In fact, not coincidentally, the old open pit dump sits directly upon the Poor Farm.) In brief, the neighbors were transients without a political voice and without a personal connection to the land. Virtually no one else lived in the Geneva SE quadrant until Fox Run was recently built on the site of the Girl’s School.



Chicago Tribune (Chicago, Illinois) - 6 Jan 1891, Tue, p 1.

Just down the hill from the Girl’s School, on the banks of the Fox River, is an old Geneva municipal dump and the former Geneva water treatment facility. The latter had at least been moved from the southern end of Herrington’s Island where it had been located for much of the last century. Now the water treatment plant is gone from the banks of the Fox River, and the municipal dump continues to sink out of sight and mind, if not environmental impact.

In the case of the SE quadrant of Geneva Township, the arrival of inmates with low to absent income did not occur because the area was blighted. Rather the disfigurement, danger, dust, and stench of the landfills arrived during the inmates’ involuntary presence. Asa White’s substantial stone farmhouse still stands on what was a fine large farm. C.B. Dodson built the first frame house in Kane County

⁷ Initially a dump could be “sited” by anyone with a disposable parcel of land and an earthmover. Midway Landfill in Geneva is basically a series of bulldozer created gullies and ridges that were not mapped. It does not have a liner, nor modern leachate recovery system, nor a pre-engineered gas recovery system. The locations of the post closure monitoring wells were not chosen with knowledge of the underlying vulnerabilities. Consequently, as contaminants are found off-site a determination cannot be made with certainty which landfill (Midway or the adjacent Settlers Hill) is leaking, or both.

⁸ The “Enterprise Funds” of the County bore many resemblances to the City of Geneva’s “TIF Funds” in that both siphoned money from one dedicated stream to others to fund unrelated political goals. Enterprise Funds were diverted from landfill tipping fees to fund projects like canoe shoots, bike trails and baseball stadiums. TIF Funds divert property tax revenue from other tax supported purposes like schools, parks and libraries to fund private development of such national chains as Aldi, CVS, and Dunkin’. Critics often refer to such funds as “slush funds” because of the resulting difficulty in following the politically directed money, plus the governmental procedural and sometimes actual corruption that follows. i.e., “(c) The Enterprise General Fund shall be utilized for any purpose deemed appropriate by the County Board.”

https://www.countyofkane.org/MeetingMinutes/1301/1997_0708.pdf

in 1838 in the SE quadrant almost on the site that became the Girl's School sixty years later.⁹ That SE quadrant might have and should have developed differently.

Kane County's and Illinois' political decisions to concentrate geographically necessary tax supported public institutions was the result of an absence of a balance of power between neighbors (whose views can tilt toward nimbyism) and politicians (whose views can tilt toward expediency and political self-interest.) Bringing the garbage dumps to the poor people was not Kane County's finest hour. Some, but far from all, of the environmental dangers from the SE quadrant were extinguished when the landfill closed fifteen years earlier than planned on December 31st, 2006.¹⁰

However, the landfill is leaking. In 2012 methane (an explosive gas formed by decaying garbage) was detected in wells south of Fabyan Parkway after having also been found in 2009 north of "Northwestern Medicine Field."¹¹ At other times the cancer-causing chemicals 1,4 dioxane¹² and vinyl chloride¹³ have been found in wells surrounding the landfill. Vinyl chloride in wells is not a theoretical financial risk even if the scientific data do not clarify the magnitude of the health risk.¹⁴ Indeed, as early as 1981 the USEPA basically stated that there are two types of landfills, those that leak and those that will.¹⁵

For purposes of the Kuznets Curve as it pertains to Geneva, lead is the contaminant that can serve as a case in point. Lead does not naturally decompose as do many organic chemicals, so it accumulates. It does not dissipate quickly, so the axiom "the solution to pollution is dilution" does not apply. Also, just as it can accumulate in the environment, it can accumulate in the human body through inhalation and ingestion of contaminated food, soil dust, and water. In this regard, multiple small sources of lead are more dangerous in some ways than large ones. The latter can be identified, quarantined and remediated.

The lead problem will persist, so diligence should not wane. For example, the drinking water at Harrison Street School was found to contain an unacceptable lead level just one year ago.¹⁶ Soil along well travelled roads that have been in place for many decades virtually always contains elevated levels of lead. Of course, this is because Thomas Midgley discovered that adding tetraethyl lead to gasoline improved engine performance. From 1923 until 1985 "leaded" gas was the norm. After it was banned in 1985 the

⁹ *Chicago Tribune* (Chicago, Illinois). 6 Jan 1891, Tue, p1.

¹⁰ "History: The County Board approved an expansion of Settler's Hill landfill in 1994. This approval was appealed to the Illinois Pollution Control Board. The County Board's decision to approve the expansion was upheld in September 1997. A subsequent agreement [County Board Resolution 97-269] between Kane County, the City of Geneva, and Waste Management of Illinois, Inc. (WMI) stated that (1) Settler's Hill would permanently close on or before December 31, 2006 [the revocable political agreement set the date as December 31, 2007.]; (2) WMI [Waste Management] was prohibited from operating any waste incineration, waste transfer or composting facilities at Settler's Hill; and (3) WMI would not seek permitting for any other landfill or transfer station site within Geneva Township." <https://www.countyofkane.org/Pages/settlersHill.aspx> The above quote from the Kane County website mis-states and distorts the facts. A Kane County Court approved (by Judge Patrick Dixon) a settlement of a lawsuit brought against Kane County by a private individual physician on behalf of taxpayers set a non-revocable date-certain closure of 31 Dec 2006, a year sooner the above cited date. The Geneva School Board and Park Board also brought a separate suit that was contributory to the closure result and recovered some of the siphoned off taxes due to them that had been diverted by the Kane County Board to its "Enterprise" slush fund. "Landfill Law Suit Settled." *Geneva Republican* 31 Dec 1998, p6.

¹¹ Sarkaukas S. "Landfill Gas Leakage Stopped." *Daily Herald*, 5 April 2012. "Northwestern Field" is a significant point source of heavy metal, chemical, and small particle pollution of air, soil and water via its ~30 times a year prolonged pyrotechnics. This poses both acute risks to asthmatics and older people, as well as long term threats. The Forest Preserve sponsorship of the noise nuisance is in violation of their Mission Statement.

¹² Fuller, J. "Cancer-Causing Chemical Found Near Cougar's Stadium Called Not Alarming." *Daily Herald* 19 June 2018.

¹³ Young L. "State Rejects Landfill Expansion." *Chicago Tribune* 20 Sept 1995. (This Illinois Pollution Control Board decision was over-turned by the Appellate Court.)

¹⁴ Nolan M. "Crestwood completes [\$9mil] bond sale to settle lawsuits." *Chicago Tribune*. Sun, Feb 7, 2016, Other Editions, p1-3.

¹⁵ FEDERAL REGISTER May 26, 1981, pgs. 28314 – 28328. See also Peter Montague, "EPA Says All Landfills Leak, Even Those Using Best Available Liners," *Rachel's Environment & Health News* #37. August 10, 1987.

¹⁶ Girardi L. "Elevated lead levels found at some Geneva school water fountains." *Aurora Beacon-News* 17 Dec 2017.

mean lead blood level in the U.S. fell from 16 µg/dL in 1976 to only 3 µg/dL in 1991 (above 10 µg/dL is elevated, <5 µg/dL is the standard for children, zero would be best).¹⁷ “Millennials” think they have higher IQ’s than their parents and grandparents, and they are probably right. The lead levels in the air and water were much lower by 1990 than they were in the 60’s, 70’s and 80’s.

Another source of lead from leaded gasoline is soil and ground water contaminated by leaded gasoline that leaked from underground storage tanks. Just north of Geneva’s SE quadrant was Don’s Gas-for-Less at 38 and East side Drive where IEPA estimated that thousands of gallons of tetraethyl lead (TEL) fuel leaked.¹⁸ Along route 38 through Geneva were many small gas stations that are now vacant lots, Chinese food places, used car lots, mulch and firewood sellers, insurance offices, dry cleaners (yikes!), banks, and bank drive throughs, and soon a “Dunkin’”. One was right across First street from City Hall. Survival of functioning small gas stations seems to have been a bit more prolonged east of the Fox River. They all had UST’s. They very likely all leaked, but many were closed long before IEPA even existed and, thus, basically were “grandfathered” out of scrutiny.

Even Geneva schools had UST’s for heating oil. Although they did not contain lead additives, they also leaked harmful petrochemicals. Geneva District #304 removed a leaking UST from the Coultrap School campus in about 1990. Where did the thousands of cubic yards of contaminated soil from Coultrap School, Don’s Gas-for-Less and other Geneva LUST sites go? If you said Settlers Hill, you would be right. Settlers Hill was a major receiver of contaminated UST soil. 15% of Settlers’ Hill waste was construction and demolition debris (which included considerable lead in the form of lead paint) along with some industrial wastes. Examples of industrial wastes were petroleum contaminated soils and industrial sludges. There was no pre-treatment of any incoming wastes at the facility. Wastes were sent directly to the working face of the landfill after acceptance. One known incident occurred where a large load of hazardous waste was accepted in error, and never removed. Geneva was a large net importer of lead contaminated soil.¹⁹ Ironically, the contaminated soil dumped at Settlers Hill was closer to the Fox River than the location of its source. Fox River is Aurora’s major source of potable water.

Lead paint, once a major source of childhood lead poisoning through ingestion of paint chips (“pica”), has been greatly reduced since lead-based paints were banned in the U.S. in 1978. Homes built before that are likely to contain at least some lead paint. But lead inhaled and ingested by other means remains a significant problem. What individually may seem trivial, such as your neighbor burning construction debris in his fire pit, or construction crews digging nearby into lead contaminated soil, or the allure of “locally sourced, organically grown fresh vegetables” that were produced in lead contaminated soil and irrigated with lead contaminated non-potable ground water, etc., etc., can all add up to dangerous blood levels. Just as a thousand points of light can be a comfort, a thousand points of lead can be terrifyingly dangerous.

Another example of “its never over until its over” is the continued risk of lead in drinking water. Geneva no longer must inform its residents that its water is high in radium (which puts radon in the air when you shower, etc.). To accomplish this lowering of radium the Geneva water is now soft (though not to a marked degree). This is nice bonus. Now you use less shampoo while you breathe less radon.

Geneva’s older houses usually have lead supply pipes from the “Buffalo Box” in the parkway to the basement. (You can tell if yours is lead by looking at the end of the incoming pipe where it meets the meter. If it is gray and has a noticeable bulge at the end, it is lead.) In the early years this probably did

¹⁷ Reyes, J. W. (2007). ["The Impact of Childhood Lead Exposure on Crime"](#). National Bureau of Economic Research. "a" ref citing Pirkle, Brody, et. al (1994).

¹⁸ <https://external.epa.illinois.gov/DocumentExplorer/Documents/Index/170000610818> Over 2100 pages are in this file!

¹⁹ <https://chwmeq.org/asp/search/detail.asp?ID=560>

result in some increase in human lead levels, particularly if the first draw of the day were consumed. Over years the pipe develops a lining scale of lead compounds that greatly reduces lead leaching from the pipe. The science of this is still not certain. Some forms of lead scale (PbO₂, for example) may be more protective than others.²⁰ Madison, WI removed all its lead pipes in 2001.²¹ Geneva has not started.

Geneva's newer, softer water is more corrosive and soft water has been long associated with clinical lead poisoning.²² This corrosion can reduce the scaling of the lead pipe and increase lead levels in water reaching the house. If the house contains old copper pipes, the solder connections may contain lead. The plumbing fixtures themselves can introduce lead, as was apparently the case at Harrison Street School. Finally, even the common practice of grounding electrical circuits to pipes can increase lead levels in the water.²³

The evolution of regulatory environmental practices also itself presents risks and benefits. A "Tiered approach to corrective action of objectives" ("TACO") is how Illinois EPA approaches Leaking Underground Storage Tanks" ("LUST") sites like that soon to be a Dunkin' Drive-Thru at 206 East State Street in Geneva.²⁴ According to IEPA:

"There are three components to environmental risk. They are:

- Contaminants (chemicals from petroleum and hazardous materials)
- Exposure Routes (vapor inhalation; soil, dust, or groundwater ingestion)
- Receptors (humans)

All three of these components (contaminants, exposure routes and receptors) must be present for a health risk to exist. Controlling any one of these factors can either reduce or eliminate the risk. A goal of TACO is to reduce environmental risk to humans by managing one or more of these components."

Although the overall logic of the "TACO" approach seems almost unassailable, as always, the devil is in the details.

This "TACO" approach will only succeed to the extent that the variables are accurately known, both qualitatively and quantitatively. For example, the amount of lead from spilled leaded gas or other prior uses on the site at 206 East State, Geneva is unknown. Also, the assumption that the "exposure routes" are all known and, equally importantly, that these routes will remain static in perpetuity is not proven. This must be verified by accurate continued monitoring — monitoring that has not occurred, is not occurring, and is not planned. Obviously if the contaminants migrate off the site onto or under sites that are residential the risk assumptions change. Banning "receptors" (would not "victims" have been more apt?) from residing on the site (as has been done in this case), but then allowing a use intended to invite large numbers of "receptors", even if only briefly, to that site day and night is counter-intuitive, at best. And what of the employees who will spend eight hours a day in a structure on the site. These people are surrogate residents whose exposure will not be prevented by classifying them as commercial employees.²⁵

²⁰ <https://cen.acs.org/articles/93/web/2015/03/Lead-Dioxide-Coating-Pipes-Help.html>

²¹ <https://www.npr.org/2016/03/31/472567733/avoiding-a-future-crisis-madison-removed-lead-water-pipes-15-years-ago>

²² Bacon APC, et al: "LEAD POISONING FROM DRINKING SOFT WATER." *Lancet*, Vol. 289, # 7484, p264-266, FEBRUARY 04, 1967.

²³ <https://extension.psu.edu/lead-in-drinking-water>

²⁴ <https://www2.illinois.gov/epa/topics/cleanup-programs/brownfields/Pages/taco.aspx> This "TIF" funded project was granted a "special use" zoning through a contorted process of unauthorized but granted "deviances" that make it a poster child for the evils of slush funds. This parcel is also zoned one way by the City of Geneva (mixed use commercial residential) and another by IEPA (commercial/industrial only with residential prohibited because of residual pollution on the site). IEPA's LUST program is not certified by USEPA. Illinois is one of only a handful that are uncertified.

²⁵ No "dose-risk" human pharmacokinetics are known for exposure to most single environmental toxins, much less the infinite number of permutations and combinations of multiple toxins. The total cumulated "area-under-the -curve" of human toxin exposure may be greater with the allowed drive-thru use than the unallowed residential use.

The “TACO” paradigm basically endorses a conclusion that the risk of many little hurts to visitors is preferable to a few big hurts to residents. (How the minimum wage employees fit into the paradigm and in Kuznets parabola is unstated). Yet the tipping point of this “TACO” strategy is unknowable, cannot be assumed to be symmetric, and is totally opaque to the involved “receptors”. Hopefully some notice will be posted on the site that explains what its environmental history and current status is.

Living is associated with risks and one must live somewhere. Each location has its own unique “swarm” of environmental risks. How these risks interact with each other, i.e., whether they are additive, synergistic, or even sometimes subtractive, is not known. The fundamental rights to life, liberty, property, and the pursuit of happiness possessed by Americans requires their eternal vigilance. Indeed, no person’s right to life, liberty or property is safe while any governmental body, nearby or far way is in session. Many of Geneva’s hopes and fears are centered across State Street from the Little Owl.

There is always room for improvement.