

The Indianapolis Literary Club 2016-2017: 141th Year

"A foul and pestilential congregation of vapours."

(Shakespeare (~1600), *Hamlet* Act 2, Scene 2, p. 13)

Whither Hoosier Health?

Essayist: Stephen J. Jay M.D. Read on Monday, 8:00 P.M., 9 Jan 2017, at the regular meeting of the Indianapolis Literary Club, Park Tudor School.



"When Nature has work to be done she creates a genius to do it." ----R.W. Emerson

"Knowing is not enough; we must apply. Willing is not enough; we must do."

--- Johann Wolfgang von Goethe (1749-1832). *Wilhelm Meisters*, 1830

"The study of history is mankind's warning to itself.

--- Y. Yevtushenko, *The Wild Berries*, NY: Henry Holt, p. 125, 1989.

"No traces left of all the busy scene, But that remembrance says:
These things have been.

---Samuel Boyse, *Diety*. VIII Providence, 635. 12 Feb 1739

"Though I do not believe that a plant will spring up where no seed has been, I have great faith in a seed
Convince me that you have a seed there, and I am prepared to expect wonders."

___ Henry David Thoreau, *Dispersion of Seeds*, circa 1860



Key Words:

Subjects: Indiana health; Pollution;

_____ I agree to allow the webmaster of the Literary Club to upload my essay to the Club's Internet website. I also agree that, after the Literary Club transfers a copy of my essay to the Indiana Historical Society, the Society may upload it to the Society's Internet website.

Stephen J. Jay M.D.
9 Jan 2017

Indianapolis Literary Club

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Acknowledgments

1. John A. Bacone, Division Director, Nature Preserves Management. DNR Indiana Department of Natural Resources kindly provided information on the four dedicated state nature preserves that are owned by colleges and universities in Indiana: Allee Woods (162 acres-Wabash College), Stout Woods (35.46 acres-Purdue Univ.), Little Bluestem Prairie (8 acres-Indiana State University), and Merry-Lea (1,189 acres-Goshen College). He was aware that there are other research natural areas owned by IU, DePauw, etc., but they are not included in the state nature preserve system, and hence could be converted to another use, such as commercial, someday.
2. Indiana Historical Society Staff provided guides to Edwin Way Teale's papers and *Writing of Edwin Way Teale* by Catherine E. Forrest Weber and *Autumn across America*.
3. Indiana State Library, Monique Howell, Supervisor Indiana Collection Staff was helpful in providing information regarding Edwin Way Teale and possible links to David Starr Jordan and Alice Hamilton.
4. Marion T. Jackson, Editor, *The Natural Heritage of Indiana*, dedicated his remarkable book to Alton Anthony Lindsey and Robert Owen Petty, notable educators, ecology researchers, and advocates for Indiana's natural places. When writing my first ILC essay, entitled, "*Bob*", 16 Oct 2000, Dr. Jackson provided me with his personal perspectives regarding his long-time collaboration with Dr. Petty in research, scholarship, and conservation. Dr. Petty's wife, Anne, provided me a copy of Petty's unpublished poems, *Splitting the Witness Tree*, as well as reminiscences of Bob Petty's personal and professional life. These materials are archived at Wabash College and Indiana Historical Society.
5. Jesse Kharbanda, Executive Director, Hoosier Environmental Council, (HEC) worked with Senator Lugar and Pete Visclosky circa 2006 (Republican and Democrat policy makers) to initiate ICREED, a statewide coalition of business and community leaders whose aim was to raise awareness in the public and among policy makers to the need to move Indiana from its dominance on coal and other fossil fuels for its electrical power to alternative energy sources to promote new jobs, improve Indiana's economic position, lessen reliance on foreign Mideast oil, and improve the environment and public health. HEC,

under Mr. Kharbanda's leadership and his talented staff, has become a prominent and widely respected state and national voice of reason in support of science-based strategies to improve Indiana's natural resources and public health.

6. Tim Maloney, Senior Policy Director, HEC, provided updates (2016) on efforts of HEC, working with collaborators across the state, to advocate in Indiana's Legislature for policies to protect and preserve Indiana's natural places and to provide environmental, economic and health evidence to the public and policy makers, supporting the inevitable shift from fossil fuel to alternative, clean sources of energy and to strategies that conserve energy, support the building of 'green' homes and businesses and that incentivize the shift to public use of clean fuel vehicles and mass transportation.
7. Jodi Perras, Senior Campaign Representative, Indiana Beyond Coal, Sierra Club, provided thoughtful insights into the history of roles of state government, its leaders and agencies, in addressing environmental pollution issues. Significant advancement in Indiana's solid waste management in the 1990s occurred although there no reports from the state as to whether their goals were met, and recent actions by the General Assembly have attempted take away powers of local solid waste management districts. Implementation of the Federal Clean Air Act (CAA) in IN has been the single most important initiative in history to improve air quality; and addressing cities' sewer overflow problems recently are highlights in Indiana's efforts to control costly, unhealthy pollution. There have been some tangible successes. Unfortunately, the history of pollution control in IN has been one of denial of problems, strong resistance to implementation of science-based guidelines and policies. Instead Indiana has put business interests over health of the environment and Hoosier citizens; and this has ironically increased the costs to IN and its citizens (an effective increased tax on Hoosiers) from pollution caused environmental damage and adverse impacts on health. *Energizing Indiana*, an energy reduction statewide plan under the Daniels' administration, and an effective one, was killed in the 2014 legislature during the Pence administration at the behest of Indiana's utilities. This was an enormous loss of a program that prevented tons of pollutants from reaching the environment and the population. "No more stringent" rules in IN have prevented the state from addressing serious local issues such as tire disposal and pollution of factory farms. The attitudes of Governor and legislature have had a chilling effect on IDEM and ISDH efforts to protect the environment and human health. Indiana's position nationally, among the most polluted states in the U.S., reflects non-evidence based pollution control and chronic regressive policies of Indiana's Legislature. The good news is that young people and wise leaders in IN are beginning to see a different future, one based on a strong clean energy based economy with strong policies to protect the environment and human health and the health of ecosystems, upon which humankind depends.

8. Lisa Sideris, PhD. Department of Religious Studies, IU Bloomington. IUB kindly provided contact information regarding Indiana historical figures who have written about the human relationship with nature as a moral issue.
9. **Stephen Towne**, IUPUI Special Collections and Archives, kindly searched the IUPUI library for materials related to this essay.
10. Jill Weiss, Indiana Historical Bureau, Indiana State Library, author, Historical Specialist, and guest blogger at Indiana Humanities, provided insights into Edwin Way Teale, the Hoosier Pulitzer Prize winner and mid-century nature writer (*Dune Boy* and *Wandering through Winter*), one of the twentieth century's most influential literary naturalists, combining artistic, scientific and philosophical inspiration. Ms. Weiss kindly provided her April 11, 2016 article Edwin Way Teale: "Traveler in Little Realms." Adapted from her research paper (http://www.in.gov/history/files/Edwin_Way_Teale_Research_Summary_6-2-2008.pdf) created to support the text of the Edwin Way Teale state historical marker. Accessed 2 Oct. <https://blog.history.in.gov/?author=3>. jweiss@history.in.gov 317 232 2535.
11. Michael Wilkinson, Ruth Lilly Medical Library Staff provided excellent support in identifying source material for this essay.

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End Acknowledgments

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Stephen J. Jay, essayist

Hamlet. "A foul and pestilential congregation of vapours." Whither Hoosier Health

Twenty years ago, Marion T. Jackson, a prominent Hoosier ecologist, published a book, *The Natural Heritage of Indiana*, by Indiana University Press, in association with the Department of Natural Resources and the Indiana Academy of Science; it features beautiful illustrations and fifty-eight essays. While celebrating the natural wonders of Indiana, the authors documented decades of misuse, and pollution of Indiana's diminishing natural places, the prairies, the wetlands, forests and fens; they called for preservation of threatened environments, asking leaders to address the paradox in public and political attitudes of the past century: Hoosiers who express 'sentimental value to a sense of place', while simultaneously promoting development of natural environments that would diminish their unique qualities for future generations.¹⁰⁸

The Roman, Marcus Tullius Cicero, (106-43 BCE) reflecting on stewardship said: "For the immortal gods, who intended that I should not only receive these possessions from my ancestors, but also transmit them to my descendants. He plants trees to benefit another generation."^{32, 48}

Today, misuse of natural places harms the environment and health. Extraction and burning of fossil fuels provide electrical power, but emissions contaminate soil, water, and air with toxins that cause lung and heart diseases and cancers.²⁰ Emissions of carbon dioxide (CO2) and other greenhouse gases (GHG) disrupt weather and cause added suffering and disease and threats to global security.^{24, 28, 35; 55; 85, 202, 166, 167}

There are signs that Hoosiers are placing renewed importance on the ancient idea, that the fates of humankind and the natural world are inextricably linked -- diminishing one or the other diminishes both. Air pollution degrades the environment and health and thus, the whole. I'll focus this evening on the pollution we inhale--the ... *foul and pestilential congregation of vapours*, of *Hamlet*.

My aims are three-fold:

1. Summarize the burdens of air pollution on Indiana's health, environment, and economy.
2. Reflect on the irony that the burdens of pollution exist, despite the remarkable vision and wisdom of Hoosier scientists, and conservationists, who pioneered 19th and 20th c efforts to preserve nature.
3. Suggest a way forward, in 2017, to create wise and sustainable environmental and commercial strategies, not one or the other, but both, in harmony.

History: Humans and environment over millennia

Humans have harmed the environment over millennia, through agriculture, domestication of animals, creation of cities, roads, and transportation, and through mining, wars, technology and population growth.^{144, 156} Ancient peoples knew the dangers of polluted land, water, and air. Forest fires and volcanoes caused lethal pollution, as did unventilated cook stoves and smelters dating from 8,000 BCE in the Middle East.³⁶ In 400,000 year- old dental tartar, there was residue of charcoal from air pollution in Qesem Cave dwellers, near Tell Aviv. “The world’s first indoor BBQs had health consequences.”²⁰⁶

Ancient Poets, philosophers, artists, musicians, scholars, the religious, pundits, and politicians tried to make sense of humans’ relationship with the natural world and their vulnerabilities to hazards. The idea of *environmental sanitation* was adopted in ancient China, India, Asia, Egypt, and Greece.¹²⁵ Hippocrates, (460-360 BCE) wrote of environmental influences on disease in, *On Airs, Waters, and Places*.^{64, 77-80} Common sense led the mother, whose asthmatic girl wheezed in the smoke of a cook fire, to take her to fresh air to relieve symptoms.

Scientists created tools to lessen risks. Pliny the Elder’s (CE 29-79) mask crafted from bladders of animals protected workers in Roman mines from breathing red oxide of lead.^{174, 234} Leonardo da Vinci’s (1452-1519) facemask of woven cloth dipped in water protected sailors from a toxic powder of arsenic and copper compounds, a weapon da Vinci designed.^{A, 40, 260} The Italian physician, Bernadino Ramazzini, published his masterpiece on diseases of workers, in 1700, reflecting the culture of the industrial revolution and its pollution; occupational medicine was born.⁶³

Indiana’s problem with air pollution

Humankind’s struggles with pollution continue three centuries after Ramazzini’s research. But human intervention has improved air pollution, since passage of the Clean Air Act and creation of the Environmental Protection Agency (EPA), in 1970. In countries without such environmental regulations, pollution is comparable to 18th -19th c. Europe.^{4, 7, 14, 74}

Unfortunately, one-half of Americans (166 million) live in counties where they’re exposed to unhealthy particle pollution and ozone.^{29, 124, 131, 158, 224} Pollutants, such as lead and mercury, harm kids’ developing brains and are commonly found in urban and rural communities.⁶² The poor and ethnic minorities live disproportionately in these counties.²⁰³ The American Lung Association (2016) reports that IN is among the most polluted states, primarily because 85% of our electrical power comes from burning bituminous, high sulfur, coal.^{B., 7, 8; 23, 46, 59, 210, 211}

The environmental and health costs are high.¹⁰⁶ Indiana has among the highest rates of cardiovascular, respiratory, and cancer diseases. Pollutants also cause allergies, reproductive diseases, and dementia. The annual health costs of air pollution in America are \$400 per person, more in Indiana, OH and Pennsylvania, since we use primarily coal for power.^{58, 85, 116, 126, 141, 240} Indiana is also a major contributor to greenhouse gas (GHG) emissions; two of the top ten most polluting coal power plants in America emit annually 38 million tons of CO₂, equivalent to the annual pollution generated by 8 million road vehicles. We’re seventh nationally and first in the Midwest for GHG emissions that contribute to global warming

and climate change.^{B., 17, 51-53, 55-57, 85,149, 190, 191, 202}

Indiana Assets and Resources

The good news is that Indiana has a growing network of public and private resources for protecting the environment, including, thirty-four state parks. There are Nature Preserves, university forests for research and eighteen land trusts.^{2, 11, 12, 103, 108 ch47, 178, 192, 194} The Nature Conservancy has protected 100,000 acres, since 1959; DNR Nature Preserves, 50,000 acres in 250 sites, since 1967; and the Indiana Land Protection Alliance, 40,000 acres.¹⁵⁹⁻¹⁶² The Central IN Land Trust (CILT) manages the *Greening the Crossroads* project, preserving wildlife corridors.³⁰ Non-profit organizations, The Hoosier Environmental Council (HEC), Indiana Sierra Club, Indiana Division of Izaak Walton League, among others, advocate tirelessly in promoting stewardship of natural places.^{75, 76, 175} It's sobering that only 4.9 million acres (21%) (4.9 ÷ 23.2) of Indiana is forested,²³³ and only 161,000 acres (3%) of forestland is reserved.^{82, 83, 91-93, 108, 209, 161}

Environmental research is carried out at four Indiana Preserves: Purdue's: Stout Woods; Indiana State University's: Little Bluestem Prairie; Wabash College's Allee Memorial Woods and Goshen College's Merry-Lea Nature Sanctuary. Purdue University's Climate Change Research Center coordinates climate science research.^{D., 67, 109, 112, 161, 192-196, 223, 238}

Indiana Resources for environmental stewardship 19th and 20th c.

To improve and expand our resources, Indiana will need new vision, leadership, public support, political will, and resources. Fortunately, we can learn from our own state history of visionary leaders in environmental stewardship over the past 200 years.^{108, 133-135,199}

Among the first voices for protecting nature were sportsmen.^{135, 197, 189} Isaac Walton wrote the *Compleat Angler* about fishing and conservation, in 1640. William Penn was concerned about deforestation, in 1681, and required his colony to save an acre of forest for every five acres logged.^{10, 42} Benjamin Franklin petitioned the Pennsylvania Assembly to stop waste dumping and remove tanneries from Philadelphia's commercial district to prevent foul smell, lower property values, and disease.^{9, 54, 107, 207} Thomas Jefferson who said, "Science is my passion, politics my duty", became a respected botanist and student of natural science.^{13, 179}

Indiana's President, Benjamin Harrison, was an environmental visionary and heralded the conservation movement when he signed the U.S. Forest Reserve Act, in 1891, creating Yosemite National Park; Harrison preserved 13 million acres of significant natural places and helped create seventeen national forests.^{73, 99, 237} President Harrison's vision was passed to Charles Deam, (1865-1953) Indiana's first state forester, and to a spirited, Richard Lieber, who came to Indianapolis, in 1891, from Dusseldorf, GR, and worked as a reporter for *The Indiana Tribune*, later opening a successful bottling works. Inspired by nature when he visited Yosemite, in 1900, Lieber became one of America's prominent conservationists, the father of Indiana's nationally recognized state park system.^{100, 101, 137, 139, 145}

Lieber worked with Presidents Theodore Roosevelt, Hoover and Woodrow Wilson, who became his personal friend. Establishing ten state parks and five state memorials, Lieber was a persuasive fundraiser.

On his death, in 1944, the Indianapolis Times said: Lieber "...dreamed of giving the tired multitudes of the great cities a place to play and to learn from the sweep of great, green hillsides, from clear peaceful streams, from the architecture of cliffs and the serenity of flowered dells..." ^{43, 95, 136, 138}

Percy Bysshe Shelley, 70 years before Lieber came to America, penned in fewer, though no less eloquent words:

Away, away, from men and towns,

To the wild wood and the downs, --

To the silent wilderness,

Where the soul need not repress

Its music.

— Shelley (1792-1822), "*To Jane, The Invitation*," c.1820

Despite visions of early conservationists, Indiana lost 95 % of its forests, wetlands and prairies, including almost one million acres of the Grand Kankakee Marsh, called the *Everglades of the North*, one of the richest wildlife habitats in North America. It was largely drained by 1920. What remains of Indiana's natural environment is threatened. But, interest grows in bringing government and private leaders together to address our polluted landscapes, to conserve and restore Shelly's *music* to our lands and waters. ^{91-93, 108 (Ch. 50, 52, 53, 54-56), 110} Who were some of the other Hoosier stewards of our natural places-- our scientists, and literary naturalists? Their work may help inform today's conservation efforts. ^{47, 108 Ch. 49-53}

Scientists and Literary Naturalists Influence in Indiana

Called, *The first man of science...* in Indiana, George Rogers Clark (1752-1818) was sought by John James Audubon, in 1807, (1785-1851) as an authority of birds of the West. They met often at Clark's cabin, near the Falls of the Ohio River. ^{90, 180} General Clark shared his interests in nature with his younger brother, William (1770-1838), who, with Meriwether Lewis, left this area in October 1803, and returned in 1806, after completing their *Lewis & Clark Expedition of Discovery* to the Pacific. ^{61, 65, 157, 227, 253} Another historic discovery expedition began in Indiana just 20 years later. Professor Edington of DePauw University said, in 1934: "The history of science in Indiana, and in the Midwest... properly begins in 1825 at New Harmony, on the Wabash River..." ^{88, 89, 96, 244}

Robert Owen (1771-1858), the Welsh industrialist and social reformer, purchased the commune, Harmony, from Johann Georg Rapp and, while Owen's social utopian experiment failed, the renaissance it created had profound impacts in Indiana: in public service, social reform, education, libraries, research, publishing and the arts. ^{25, 127, 128, 163, 164} Preeminent scientific naturalists, educators, artists and musicians traveled down the Ohio in December 1826 on the keelboat *Philanthropist* (aka, *Boatload of Knowledge*) to live and study at New Harmony. ^{187, 229, 232} Scholars have described this event as "one of the significant

intellectual migrations of history.”^{37, 38, 39, 102, 117, 235 p3} Historians have noted that the research of scientists associated with New Harmony likely exceeded that from all Indiana colleges and universities prior to the Civil War.^{25, 90, 89}

Robert Owen, his sons and daughter, were prominent figures in this history.^{C., 50, 98, 100, 133, 148, 165} Owen’s eldest son, Robert Dale, (1801-1877) a social reformer, abolitionist, advocate for women’s rights, and free public education,¹⁰² represented Indiana’s First District in Congress, and introduced the bill establishing the *Smithsonian* Institution, the world’s preeminent *Museum* of Natural History.^{214, 216, 86}

Robert Owen’s son, David Dale, (1807-1860) a physician and scientist, was known as the *Pioneer Geologist of the Midwest*, who with brother Robert contributed to the foundation of the U.S. Geological Survey.^{25, 37-39, 98, 117, 235 p3}

Owen’s youngest son, Richard, (1810-1890) also a physician, was professor of natural history at Indiana University and a nationally known scientist, geologist, and educator.^{25, 34, 130, 176, 177, 230, 231, 251, 259} In 1872, he was appointed President of Purdue University, and, in 1885, sixty years after his father started the New Harmony experiment, Richard became a founding member of the prestigious Indiana Academy of Science.⁸⁹ He died in 1890, when he mistakenly drank from a jug of “medicated water” that actually contained embalming fluid.^{41, 176}

Richard Owen’s successor, as chair of natural history at IU, was David Starr Jordan, (1851-1931) one of Americas great academic leaders.^{94, 118, 121} An eminent biologist, physician, poet, and philosopher, he authored 600 scientific papers and 50 books. He taught at Shortridge High School and Butler University, and then chaired the Department of Natural Science at IU. (1879-1891) He was founding President of Indiana Academy of Science, the youngest President of IU, in 1884, and the first President of Stanford University, in 1891.^{104, 120, 146}

Thus, 19th c natural science in Indiana was robust and provided a foundation for understanding the importance of the natural environment for optimum human development. These science traditions continued into the 20th c.

20th Century Science; Alice Hamilton

Alice Hamilton, (1869-1970) from Fort Wayne, (ILC, SJJ Essay, 2013) pioneered air pollution science, founding the specialty of Occupational Medicine in the U.S. She created America’s first environmental health policies and was an early 20th c advocate for regulation of disease-causing chemicals.^{1, 69, 115} Perhaps, her greatest legacy was her mentorship, while at Harvard, of two women who created the scientific basis of disease resulting from air pollution and the foundation for federal clean air policies in America.

Harriet Hardy, (1905-1993) discovered an often fatal, illness, berylliosis, in the 1940s, among workers who inhaled fumes while making fluorescent lamps, (GE and Sylvania) in Boston.^{70, 168, 155} In 1954, she was among the first to link asbestos inhalation with cancer. For decades, Hardy and Hamilton advocated for reducing air pollution to improve public health; their textbook, *Industrial Toxicology*, is still used today, 80

years after its inception.^{114, 152}

Alice Hamilton mentored another pioneer in air pollution research, Dr. Mary O. Amdur, (1921-1998) who overcame gender, political, and scientific barriers in the 1940s and 50s to describe how mixtures of air pollutants, sulfur dioxide and particulate matter, interacted to cause disease. Amdur became the ‘Mother of Smog Research’.^{6, 33, 72, 152} She studied the 1948, Donora, Pennsylvania, smog epidemic, that sickened thousands and killed 20 persons. She found that the chemicals sulfuric acid and sulfur dioxide, emitted by the American Smelting and Refining Company (aka ASARCO-AS&R) likely caused the Donora tragedy. As she prepared to publish her research, Amdur was threatened by AS&R and her own professor, at Harvard, Philip Drinker, whose research was paid for by AS&R. In 1953, Mary was physically accosted by two thugs in an elevator and threatened not to present her research. Dr. Drinker ordered her not to publish. Mary refused, was fired, and for years she was harassed by her superiors. Her Pennsylvania “Dutch stubbornness and adherence to principle” prevailed and her research formed the basis for the first science-based air pollution standards in America. Today’s knowledge of the deadly effects of breathing particulate matter is based on Amdur’s research 70 years ago. After retirement, she received awards and accolades. Her original research in 1953 was never published.

Early American Literary Naturalists

In addition to these remarkable environmental researchers, America produced literary naturalists—who wove into ‘whole cloth’ the science and aesthetic aspects of the natural world, bridging science, literature, poetry, and art while communicating their work with popular appeal, raising public awareness to the fascinating ‘web of life’: Charles Darwin (1809-1882),⁴⁵ Henry David Thoreau (1817-1862),²²² John Burroughs (1837-1921),^{21, 22} John Muir (1838-1914),^{150, 151} Albert Schweitzer (1875-1965),²⁰⁴⁻²⁰⁵ Aldo Leopold (1887-1948),¹³² Rachel Carson (1907-1964),^{26, 27} Sigurd Olson (1899-1982),^{172, 173} Loren Eiseley (1907-1977),¹⁸ and Edward O. Wilson (1929-),^{248, 249} Carl Sagan (1934-1996),^{200, 201} and Stephen Jay Gould (1941-2002) among others.¹⁰⁸ Aesthetic values, not just economic values, were expressed as rationale for preservation of nature. Albert Schweitzer’s philosophy, “Reverence for Life” encompasses tenets among the world’s religious communities and underpins the logic of literary naturalists’ values.^{204, 205} Rachel Carson celebrated Schweitzer’s philosophy when she dedicated, *Silent Spring*, to him, in 1963.

Early Indiana Literary Naturalists

Indiana can claim some of the finest literary naturalists of 19th and early 20th century America.

David Starr Jordan, (1851-1931) was a natural science-essayist ‘to the worthy school of John J Audubon, Henry David Thoreau, John Burroughs and John Muir.’¹²⁰ Jordan met Muir in Indianapolis and became his friend and colleague. They met frequently, and Jordan said of Muir on one meeting: “He was lately back from the Yosemite, where, in rollicking enthusiasm, he had written the finest bird biography in existence, the story of the *Water Ouzel* in the *Ouzel Basin* of the Brewer Range.”^{119, 122, 123; 213} Jordan became a charter member and served on the board of directors of the Sierra Club, 1892-1903.^{212, 213}

John Muir, (1838-1914) from Scotland, lived in Indianapolis in 1866-67 and worked at the Osgood and Smith carriage factory, 230 S. Illinois Street, where he pursued interests in machines and his hobby, collecting botanical specimens.^{60, 105, 150, 151} He suffered a near tragic accident at the factory, was blinded for a month, and while recovering, chose his life's work, the study of "inventions of God," becoming the *Bearded Prophet* of American West, a poet, scientist, explorer, pantheist, nature lover, political activist, and founder of America's conservation movement and the Sierra Club. A friend of President Theodore Roosevelt's, Muir lobbied for national forests. Roosevelt had said in 1905: "Every man who appreciates the majesty and beauty of the wilderness and of wild life . . . should strike hands with the far-sighted men who wish to preserve our material resources, in the effort to keep our forests and our game-beasts, game-birds, and game-fish . . . from wanton destruction." Muir influenced Roosevelt, Congress and galvanized public support for creation of Yosemite, Sequoia, Mt. Rainier, Petrified Forest and Grand Canyon National Parks.

Gene (Geneva Grace) Stratton- Porter (1863-1924) was born on a farm in Wabash County, 1863.^{108 (ch50)}
³¹ Her mother died of typhoid when Geneva was 12 and she received little schooling, but pursued her love for nature and nature photography, specializing in birds and moths. A self- taught nature writer, she researched and wrote of her outdoor experiences in northeastern Indiana swamps.^{97, 217} The preeminent Purdue ecologist, Alton A. Lindsey, said: "her most original and intellectually satisfying work (in 1912) proved to be *Moths of the Limberlost*" ...containing "her own remarkable, accurately un-posed watercolors of the live, freshly emerged insects."^{108, p402} Her twenty-one widely translated and best selling novels, had 50 million readers worldwide. Stratton-Porter used her wealth to support conservation of Limberlost Swamp and other wetlands in Indiana. But, she was not without controversy.
³¹ When Indiana University Press republished five of her popular books, including, *Girl of the Limberlost* and *Freckles*, in 2009, the New York Review of Books critic called Stratton-Porter a highly effective "page-turner" but said, the novels' contents were rich in "consumerist fairy tales", with moralistic and sentimental themes, that included racial overtones.¹⁴³ Stratton-Porter's success and illness led her to Los Angeles where she formed a movie production studio, in 1919. Her novels, *Laddie*, *Freckles*, *Keeper of the Bees*, and *The Magic Garden* became movies, and *A Girl of the Limberlost* was adapted four times as a film, from the 1924 silent movie to a 1990, made-for-TV film.

Edwin Way Teale (1899-1980) was born in Joliet, Ill., but we claim him as a Hoosier, since he spent his formative years, in summers, to age of 15, with "Gram" and "Gramps" at *Lone Oak* farm, near the lakeshore of Indiana Dunes.^{242, 219} Teale recalls a sleigh ride with his grandfather in a forest near *Lone Oak* when he was only 6 yrs.-- "the starting point of my absorption into the world of nature."²⁴³ "Gramps" gave him a box camera, after Edwin picked 20,000 strawberries to purchase it. Teale said it opened the door in his golden age of boyhood, free to roam the dunes environs and ask questions about nature. Teale excelled at Earlham College, a star debater and class president in 1922 and at Columbia University. He published *Grassroots Jungle*, (1937) which established him as a world expert in insect photography. Teale pioneered the technique of using an ice box to immobilize insects, then place them in natural surroundings, set up a camera with magnifying lens and wait for the insects to reanimate. In his 1945 article in *Nature Magazine*, on insects, Teale raised concerns about the environmental impacts of DDT, seventeen years before Rachel Carson's, *Silent Spring*. Teale mentored Rachel Carson and Carson sought his guidance as she wrote *Silent Spring*, the book that changed American's views of conservation.^{220, 221} For fifty years from 1930-1980, Teale's, research was the primary source of knowledge regarding the

environmental status of North America. Internationally renowned, he was President of the New York and Brooklyn Entomological Societies, a fellow of the American Association for the Advancement of Science, the New York Academy of Sciences and U.K.'s Royal Photographic Society.

A prolific author, Teale wrote thirty-two books; he co-wrote *Vernal Equinox*, a TV episode of *Omnibus*, hosted by Alistair Cooke. Teale's 1943 book, *Dune Boy: The Early Years of a Naturalist*, was a memoir of Teale's life at *Lone Oak Farm*; the Army distributed 100,000 copies to service men in WW II, and it was considered "a timeless model of the democratic common life, for many . . . an image of their real American homeland."²⁴² Two years later, the Teale's received word that their only son, David, 19, had been killed in WWII. Teale and his wife, Nellie Imogene Donovan, to deal with their grief, began a 20-year, 70,000-mile automobile odyssey across America. They captured the science, beauty and soul of the North American Seasons, a four-volume opus. In 1965, Teale published the fourth volume, *Wandering Through Winter*, (1965) and in 1966 he received the Pulitzer Prize, the first naturalist to receive this award for general nonfiction. Teale received honorary degrees from Indiana University and Earlham College. Naturalists and conservationists have ranked Teale with John Muir, John Burroughs and Henry David Thoreau.^{16, 226, 243}

How can IN look to the future and improve? What has to change?

This "quick step" through 200 years of Hoosier contributions to America's 19th c. conservation awakening, raises the question: can we recapture some of their vision and achieve a balance in development and protection of our natural environment? The aim: to create, in Indiana, one of the least polluted states over the next 10-15 years?

Observers offer suggestions for accomplishing this goal including: educating kids in natural environment classrooms; building bipartisan problem-solving with respectful discourse; establishing a vision and plan to shift from fossil fuels to clean power technology,^{70, 239} expanding evidence-based policy-making; and most importantly, creating a decision-making process that balances economic and environmental sustainability.^{5, 44, 108, 203} Does a tree in an Indiana forest have value while standing and absorbing carbon from the atmosphere or only when it's cut for lumber sale?

Why have Hoosiers failed to implement effective remedies over the past 60 years? It seems unlikely it's just lack of knowledge. Hoosier experts and community leaders have tried to educate the public and policy makers about the environmental, health, economic and moral/ethical rationale for implementing remedies.²¹⁸ I'll mention three persons who played leading roles in science, education and advocacy.

Alton Lindsey (1907-1999) was a leading 20th c American ecologist, known as the "Father of Natural Area Preservation in Indiana."^{195, 140} A professor of forest ecology at Purdue University from 1947-73, his research was instrumental in creating Indiana's first nature preserve at Pine Hills and, subsequently, the Indiana Dunes National Lakeshore. Lindsey was the vertebrate biologist for the second Byrd expedition to Antarctica (1933 to 1935). Admiral Byrd admired his research and had 12 islands off the coast of Antarctica named the *Lindsey Islands*.¹¹³ Alton Lindsey's writing career spanned 80 years, and included science articles, books and poetry; his last manuscript was produced at age 90. Lindsey was one of the founders of Indiana's The Nature Conservancy.

Robert O. Petty, (1933-1990) the subject of my first essay at ILC (sjj, "Bob," 2000), ¹¹⁵ was born in Indianapolis and graduated from Butler University, in 1956, with a passion for science, literature and poetry. He studied ecology at Purdue University under the tutelage of Dr. Alton A. Lindsey, who became Petty's life-long professional "Father." ¹¹³ Excelling in ecological research, Petty received Purdue's highest literary award, the Frederick L. Hovde award for poetry; Petty was described as a "biologist with a scientist's mind and a poet's heart", ⁸⁴ In his brief life he was a consummate researcher, teacher and mentor who played pivotal roles in preserving some of Indiana's cherished natural places. ¹⁵ In the traditions of Edwin Way Teale, Petty became a gifted literary naturalist, contributing to science journals, popular press and Special Publications of the National Geographic Society, where he shared the dais with leading naturalists, scientists, and conservationists, including Sigurd F. Olsen, Edward Abbey, Frank Craighead, Jr., and Stephen Jay Gould, among others. Petty was a ghostwriter for "Lady Bird", the wife of President Lyndon Johnson. ^{115, 181-185}

The third prominent leader, Marion T. Jackson, (1933-), was also a student of Alton Lindsey at Purdue and became one of Indiana's leading advocates for conservation, a teacher and mentor of thousands of students at Indiana State University, a researcher, writer, and editor of the remarkable *Natural Heritage of Indiana* which Dr. Jackson dedicated to his mentor and colleague, Dr. Robert Petty.

Unfortunately, Indiana, particularly its policy makers, haven't responded to these wise experts, perhaps for the same reasons some patients don't listen to their doctor's advice to lose weight or eat healthy. But, in addition, to the voices of Lindsey, Petty and Jackson, a myriad of Hoosier environmental and faith-based organizations, business leaders, and private citizens' over the past five decades have added their informed ideas for protecting Indiana's ecology, economy, and health. Missing from debates has been consensus that we have a problem. The politicization of environmental debates, chases reason from the discussion and is demoralizing. Gordon Durnil, a prominent Hoosier lawyer, diplomat, politician and 1989 Bush appointee, in a book, *The Making of a Conservative Environmentalist*, makes a case that: "one of the largest barriers to achieving environmental protection is the artificial labeling of those who seek a clean environment as 'liberals' and the labeling of conservatives as 'anti-environmentalist'". ⁴⁴ Durnil says, that: "Protecting the environment is not about being a liberal, a conservative or an independent; it's about ethics in industry, government and the home—the basis of sustaining true environmental protection."

Barriers to progress and opportunities

Research shows that most Americans and Hoosiers (regardless of political label) want sustainable economic progress, balanced with environmental stewardship. The business, public health, and moral/ethical cases for consensus are strong. Technology is enabling the shift to clean power; but only 5% of Indiana's energy comes from renewable sources. ^{19, 171, 198, 228} Divisions among policy makers are often political and not based on common sense or science. Divisions within religious and science communities have been barriers to achieving consensus. A quote in the 1825 New Harmony Gazette said: "If we cannot reconcile all opinions, let us endeavor to unite all hearts." The good news is leading scientists and religious leaders around the world seek to unite hearts and minds regarding environmental destruction of

planet earth.

The preeminent Harvard biologist, Edward O. Wilson, proposed, in 1990, that the religion and science communities, globally, find common ground on environmental stewardship.^{3, 225, 245} Led by Carl Sagan, thirty-two Nobel laureates, sent an open letter to America's Religious Communities--expressing doubts about humanities' response to climate change, deforestation, extinction of species, or what religious communities sometimes call, 'crimes against creation.'^{200, 201} The letter urged religions and scientists to address the problems. The ripple effect globally has been impressive. In 1992, a consensus statement, signed by 1,575 of the world's most prominent scientists (including 99 of the 196 living Nobel laureates) was sent to world leaders, asking people to take immediate action to stop environmental degradation.²⁵⁴⁻²⁵⁸

The World Council of Churches urged action at the Climate Conference in Cancun, stating: "Humankind is at present dancing on the edge of the abyss." Such actions are not surprising since the world's religions have ancient traditions of environmental stewardship. Pope Francis's Encyclical, *Laudato si' (On the Care for Our Common Home)*¹⁸⁸ is an eloquent statement of those traditions and a reminder of the "tragic consequences" of unchecked destruction of environments.¹⁸⁶ Citizens see daily evidence of personal and community harms from severe weather, pollution, emerging diseases, droughts, forest fires, catastrophic flooding, rising sea levels, with climate refugees in America and globally. Scientists believe they are now witnessing and monitoring the "Sixth Extinction" of planet earth. These are profound threats to health, economies, and the way humankind thinks about moral/ethical values, justice and sustainable resources for quality life for all people.^{142(p303), 200, 201, 208, 225}

Leaders of the fourteen major religions, from Bahá'í to Christianity, Confucianism, Hinduism, Islam, Judaism and Shinto, among others, have strongly endorsed the ethic of global sustainability and echo the principles outlined in the Pope's Encyclical.^{188, 255, 256} Seyyed Hossein Nasr, internationally known professor of physics and Islamic Studies at Georgetown University commented, "...If the world is just a bowl of molecules banging against each other, then where is the sacredness of nature?"¹⁴²

Conclusion

There is irony in Indiana's history regarding its natural resources—a plethora of riches of visionaries over 200 years but a poverty of sustained action to protect the natural environment and societies' health and wealth. We need a way forward, in 2017, to create viable environmental and economic strategies, not one or the other, but one and the other, with a goal of protecting health, wealth and national security.

Perhaps, if we do a better job communicating to the people, in the words of Theodore Roosevelt, the "*wanton destruction*" of natural environments and opportunities for improving health and wealth, we might lessen divisions and promote cooperation in addressing the problem. Perhaps only economic incentives and disincentives will draw decision makers to this place.

E.O. Wilson, said this year in *A biologist's manifesto for preserving life on Earth*: "We are playing a global endgame. Humanity's grasp on the planet is not strong; it is growing weaker." The rate of change in threats to survival and extinction of species has increased sharply: In America: Bees; Eastern Box Turtle

and Tortoises; Salamanders; Orca (Killer Whales); Bats; Bison; the Polar bear; North Atlantic cod; Trout; Frogs; Manatees; Right whales, and ocean corals, to name a few. ^{129, 154, 241, 258}

Martha, named after George Washington's wife, and the last passenger pigeon in America, died at the Cincinnati Zoological Gardens in 1914, a cautionary tale. Audubon, near Louisville in 1813 observed: ". The air was filled with pigeons. The light of the noon-day was obscured as by an eclipse." ²¹⁵ Hoosiers have lost forever the Passenger Pigeon, Eastern elk, Carolina parakeet, Blue pike, Blackfin cisco, Leafshell clam, among many other species ²³⁶

The world's nature reserves, in 2015, occupied less than 15% of Earth's land and 2.8% of Earth's oceans. Climate change is a deadly threat that humanity has imposed on itself, raising fundamental questions about our relationship to the biosphere: Does it belong to us? Do we belong to it?" ^{81, 147, 169, 170, 246-248}

In his 2016 book: *Fifty-Fifty*, Dr. Wilson estimates that Earth's principle habitats and species can be saved within half of Earth's surface. ⁸¹ He adds that: "It's our nature to choose large goals that are potentially game changing and universal in benefit. To strive against odds on behalf of all of life would be humanity at its most noble." ²⁴⁶⁻²⁵⁰

Indiana has enormous opportunity to respond to these threats, while cleaning up pollution in our own backyards, including our "... foul and pestilential congregation of vapours." I'll end with another Shakespeare quote (with apologies), from *Troilus and Cressida*, where he poses a solution we might embrace: "One touch of nature makes the whole world kin."

—William Shakespeare (1564-1616), *Troilus and Cressida*, Act III, Scene iii, 169-179 -Ulysses, speaking to Achilles.

End essay: SJJ 9 Jan 2017, Indianapolis Literary Club, 141st year.

Addendum: (With apologies to Shakespeare!) The quote from Shakespeare, "One touch of nature makes the whole world kin" is often mistakenly attributed to John Muir. (Sierra Club. John Muir. Quotations from John Muir, Selected by Harold Wood, 2016). Its use today, according to scholars, is frequently not consistent with Shakespeare's intended meaning in *Ulysses*.

In my essay, the meaning is not that of Ulysses speaking to Achilles, but instead to the *oneness* experienced when one experiences nature, a "fellow-feeling", when one touch of the natural world brings people together. "Sympathy awakened makes men feel their close relationship to each other." (The Path-Sept 1889. One Touch of Nature, K.H. Theosophical Press online: http://www.theosociety.org/pasadena/path/v04n06p176_one-touch-of-nature.htm.)

End Addendum

Indianapolis Literary Club, 9 Jan 2017

Stephen J. Jay MD, Essayist

Title: "A foul and pestilential congregation of vapours."

(Shakespeare, *Hamlet* Act 2, Scene 2, pg. 13)

Whither Hoosier Health?

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To the reader: A complete list of citations for this essay is available from the author and numbers about 260 - from science publications, the humanities, literature and selected popular press accounts. There are thousands of peer-reviewed papers that document the adverse impacts of air pollution on living beings and the severe impacts of global warming and climate change on the environment and public health.

End document (Title Page; Acknowledgements; Essay; Twenty Selected References

Indianapolis Literary Club

January 9, 2017

Essayist: Stephen J. Jay M.D.

Hamlet. "A foul and pestilential congregation of vapours." Whither Hoosier Health?