

Legacy Lecture
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A. Introduction

1. Thank you for waiting, I m sorry to be late for this very prestigious occasion. I could not find my hair gel and pocket comb.
2. For those of you who do not recognize me and think I am an imposter because we were acquainted a half century or so ago, I have some photos to the verify my identity during the days you were on campus. This is really me.

B. Thanks to Robert Simpson and Ed Bagale

1. Thank you, Provost Simpson, for your thorough and thoughtful introduction. Although the Environmental Interpretive Center was a gleam in our eyes when Cal DeWitt and I walked the area in 1969 and when our first Chancellor Leonard Goodall commissioned a plan and model, your leadership, Robert, on the campus was indispensable and your assurance of adequate funding made its implementation an outstanding contributor to our community. Your dedication and the indefatigable and relentless efforts of Vice Chancellor for Government Relations, Edward Bagale, made this 20th Anniversary possible.
2. Today is the first that I knew of the details of your initiative and interactions with Ed Bagale and the State of Michigan legislators to acquire 75% of the funding for the Center to be written into a law of the State of Michigan. My thanks for your daring-do and all that it involved. A special recognition must be given to Ed Bagale for his persistence and perseverance over several decades with the legislators in Lansing. Insiders have said that the legislators would give him whatever he wants, just to get rid of him. Both Robert and Ed expanded the outreach of our campus to all people in southeast Michigan whether they enrolled in classes or not. Thank you.
3. My thanks to all of you for joining us today and for your personal notes about your significant experiences with our campus and for your well-wishes for the future. At the same time, if any of you alumni still feel you deserve a better grade, please see me about some extra credit research in the Environmental Study Area.
4. Thanks to Dr. Claudia Walters, Dorothy McLeer, and Rick Simek, Dale Brown, Griffin Bray and Katelyn Tatro for their excellent review of the Environmental Interpretive Center on this special occasion of its 20th Anniversary. I am pleased that it coincides with the Legacy Lecture in which I will highlight selective aspects of my personal recollections of our 50-year history, our current practices, and aspirations for the future.

C. The World in 1969:

Raise your hand if you were alive in 1969. [Pause] Good, then you will have experienced or have had adults recount to you some the context in which our campus was operating at that time.

1. We were suffering from the scars from the 1967 rebellion in Detroit.
 2. We had a military draft requirement for men at that time and the Vietnam War was in the news daily, I traveled thought O'Hare airport frequently at that time and saw young men my age and younger in military uniforms walking with crutches and arms in slings.
 3. Our campus had teach-ins on the legitimacy or the Vietnam War.
 4. The pall of the assassinations of Martin Luther King, Jr. and Robert F. Kennedy hung over our cities.
 5. On July 20, 1969 Neil Armstrong and Buzz Aldrin landed on the moon.
 6. Dearborn was an all-white community with Mayor Orville in charge. Can you remember any of those events?
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D. UM-D and OGG: A Perfect Fit

1. For me, the University of Michigan-Dearborn has been a perfect fit with my interests and background.
2. Academically, I had a liberal arts education all through my academic life with a Bachelor of Arts degree from Calvin College, now Calvin University. Early on I learned that all facets of learning should be integrated and unified. Thus, I felt comfortable with the growth and development of the liberal arts program at UM-Dearborn from 750 to 9,000 students.
3. Consequently, interaction with faculty in humanities, engineering, business, education, behavioral, social and natural sciences was a given and much appreciated.
4. New and rapidly growing programs and curricula offered an opportunity to teach a wide range of courses.
5. I value our commuter campus which serves people from more than 40 language groups, cultures, and customs. Because the students were residents of our local communities. they were personally invested in the environmental issues.
6. UM-Dearborn has an outstanding 300 acre natural area inherited from the estate of Henry and Clara Ford and designed by Jens Jensen. Where else in a heavily dominated urban industrial area does one find habitats of forests, meadows, ecotones, fields, a lake, the Rouge River and its floodplain. We need to recognize Chancellor Leonard Goodall and Provost Eugene Arden for their efforts to have the area designated by the Board of Regents of the University of Michigan for preservation and education of our students and the community. We also need to recognize the efforts of Professor Emanuel Hertzler for stopping construction people from filling the campus lake with fill soil dug to make basements for our buildings.

7. Speaking of the Environmental Study Area, it has existed since Jen Jensen exercised his skills in restoration ecology on the Henry and Clara Ford Estate in 1915. At the same time the adjacent floodplain of the Rouge River existed several thousand years before that. I would like to show a recent discovery on our floodplain. On a walk on the Sugar Maple trail, you have the impression that the floodplain is flat. Well, the floodplain does look flat. Yet, we got a different picture after Rebecca Svoboda and Molly Hirst measured its elevation every five feet on a 600-foot transect from the terrace, along the lake of the White Oak Trail, to the Rouge River. Here is the result of that transect. Note that the terrace drops eight feet into a backswamp, then rises to the second bottom, then drops slightly to the first bottom from which it rises to a traditional levee, dips into an overflow channel, and finally to a sandy deposition bar and the river bank. Griffin Bray along with assistance from Kate Truitt and I inventoried the woody and herbaceous vegetation in each of these habitats and found significant differences in species composition.

E. The campus in 1969: That was Then

1. Let me state the obvious, the campus has changed since 1969.
2. The campus' original name was the University of Michigan – Dearborn Center and changed its name to University of Michigan- Dearborn in 1964.
3. When I arrived, we had 750 student who were juniors, seniors, or graduate students with focus on co-op education in engineering and business. The students were enrolled year- around, three semesters per year -- October to – January, February to May and June to September. They would alternate a semester taking classes on campus and a semester doing a fulltime internship with one of the companies in the area.
4. As an aside, the calendar was well suited to the members of the Detroit Tigers baseball team because the October to January semester coincided with their season break and made it possible for the Tiger's all-star catcher Bill Freehan to attend and graduate from our campus as well as be part of the 1968 World Series Champions.
5. We also had students in education and the liberal arts, including Experimental Biology and Chemistry, and with Physics and Biochemistry on the horizon. Geology, Environmental Studies, Environmental Science, Microbiology, Integrative Studies, Behavioral and Neurobiology were a dream.
6. You will easily recognize a 10-year old "Classroom-Administration Building" (CAB) with the adolescent Pin Oak trees in front now adult Pin Oaks. And a few years later the first building funded by the State of Michigan was added. The windowless "Classroom Office Building" or COB looks like it was really cover for a top-secret CIA headquarters. Many years later it was remodeled with windows added.
7. We had one floor-model copy machine on campus. Ditto machines were the standard duplication process that produced bluish colored font.

8. Because of the predominance of men faculty members, we had an active and dynamic faculty wives club later changed to the faculty women's club.

F. Personal History connections with the campus.

1. This was the campus to which our family moved in July 1969. As the campus grew so did David and Allen who went off to college, married and had families of their own leaving my wife, Charlette, (Char) and me as empty nesters. But that was not a problem because I could come to campus every day and harass other people's children.
2. I want to give special recognition and thanks to Char who co-partnered and managed our family's lives in numerous and inestimable ways. Please take five seconds and list all the adjectives that you can think of that describe a really, really nice person. Five seconds, Go. Right, I agree with all of the good things you thought. I would wrap them all up by saying "She caring, compassionate, and forgiving, (you notice I did not say patient) and has been is "a lot of fun to live with." for 61 years. Her advice for a successful marriage is "don't canoe together, and don't hang wallpaper together. Thank you, Char.

G. The New and Expanded UM-Dearborn.

1. In the Fall of 1971, our campus enrolled its first freshmen class of 313 students and University went through a major transition. We had to design biology and chemistry courses for half of the students who were science majors, and a science course for the other half of the students who chose majors other than science. Rather than teach separate courses in introductory biology, and physical science, we took on the challenge, as other disciplines did also, to integrate our natural sciences into one course Under the direction of Dr. Calvin DeWitt, we implemented a course that he designed as a two semester course built around the environment, called Matter, Energy, and Life, where we learned that Matter cycles, Energy flows, and Life adapts.
2. At that time Scientific American published special volumes which served excellent reading material. We had only a few weeks in the summer of 1971 to design the laboratory for the 150 students and purchase the equipment, all the while we were directing an eight-week National Science Foundation Institute for middle and high school teachers. But we improvised, and began teaching about adaptations of living organisms by studying the adaptations of the weeds in the lawn, especially the dandelion, and asking the students to bring weeds from their lawns and gardens to characterize their adaptations.
3. We also went to the Lower Rouge River along Michigan Avenue near the current location of Andiamo's restaurant and had teams of students map the meanders of the river and determine the ratio of the channel meanders to downstream distance

and width with sextants, tripods, survey rods and measuring tapes. Keep in mind, we had no GPS units and laser beams or computers to develop maps. Matter, Energy and Life is the only course from the freshman curriculum to survive the shift to more strictly traditional university disciplinary courses.

4. Recently, a student from this class wrote of her distinct and clear memories. She is a research epidemiologist with over 300 publications. In addition to examination of the biological factors, her epidemiology research integrates the patients' social, emotional, and environmental factors in her analysis which she attributes to her science education beginning in MEL.
5. I had the privilege to team-teach the course with Dr. Cal De Witt who left for the Gaylord Nelson Institute of Environmental Studies at the University of Wisconsin-Madison and also founded the program at the Au Sable Institute of Environmental Studies. Dr. David Emerson, our organic chemist taught about pollutants in air, water, and acid rain. Dr. David Sokoloff, a physicist taught about energy and later served as director of course. In 2020, David received the Physics Educator of the Year award, from the American Association of Physics Teachers. With this prestigious honor he joined a group of physicists which included many Nobel Prize winners. He is introducing students in Vietnam to physical principles using his unique strategies. In his acceptance of the award, he graciously acknowledged the influence of his experiences of directing the Matter, Energy, and Life course on our campus for his initiative and success in redesigning physics education.

H. **Let's look at UM-Dearborn and its involvement in the Environmental Movement**

1. Several major environmental events took place in 1969. The Cuyahoga River in Cleveland caught on fire and not to be outdone, we in Detroit inadvertently set our Rouge River on fire. But the climax of it all was the Santa Barbara oil gusher of 1,000 gallons per hour for a total of 3 million gallons caused by an explosion on an oil rig. President Nixon visited the site personally. This catastrophe, along with foul water and unbreathable air, resulted in a cascade of alphabet soup environmental legislation including NEPA, CAA, CWA, TOSCA and more.

2. 1970 was the year of the popularizing of the environmental movement with teach-ins. First at my alma mater Northwestern University, where my laboratory for biological rhythms of desert iguanas had been turned into the Teach-in headquarters, and then at the University of Michigan-Ann Arbor. The National Earth Day, April 22, 1970 was led by Senator Gaylord Nelson of Wisconsin. Coincidentally, it was the 100th birthday of Vladimir Lenin and the conspiracy theorists had a field day connecting the so-called subversive intentions of environmental people with communism.

3. On our campus the student group, the Dearborn Naturalist Association (DNA) led by Michael Teeley, who is with us today, organized a highly successful two-day weekend celebration and teach-in on our campus prior to Earth Day itself. We had notable guest speakers, a selection of films the kind you show with a movie projector, and literature. We also had the first self-guided tour of the Environmental Study Area. On Earth Day itself, the students went to the elementary, middle, and high schools throughout our area and made presentations to their students. We have not had an event like it since. I believe it was due to the closeness and camaraderie of the students from all disciplines.
4. Our University responded to the upsurge in all things environmental. Recognizing that environmental topics ranged from the sciences of ecology and biology and the physical sciences of air, water, soil, geomorphology, and energy as well as policy, politics, economics, education, organizational management, and ethics, we implemented both the environmental science program and the environmental studies program in 1975. Because careers in the many areas of “environment” were not as obvious as they were in the area of pre-medicine, business, engineering, and education, we were the first programs in CASL to require an internship to connect the students to the world of work.
5. *After 50 years, people invariably ask, “Have you noticed a change in the students? My response is, “That is difficult to say because I have changed as well. Yet one noticeable change is in the dress and clothing. A majority of men faculty member wore coats and ties in class. The students have changed in wearing apparel, too. They show off how wealthy they are by paying extra money for jeans with holes in the knees and intentionally frayed fabric on the thighs to be able to look poor.*
6. Perhaps some of you alumni remember that smoking cigarettes in class was common. A particularly egregious practice was conducted by a cellular biology laboratory instructor. In cell biology students are likely taught that nicotine paralyzes the cilia of the human trachea. In his four-hour laboratory stint, he smoked more than a dozen cigarettes. I know because he dropped the butts in the sink in the lab.

I. Moving on to My Teaching Experiences in Biology and Environmental courses.

My first teaching assignments were Environmental Physiology, Comparative Anatomy of Vertebrates, and Introductory Biology all with laboratories as well as Methods of Teaching Biology in Middle School and High School for the Education Department. Actually, I was really a life-long student disguised as a professor. Over time, I began to see teaching more like coaching.

My number one course was Field Biology, of which I taught 89 sections. My first section of Field Biology in 1970 had 70 students. We split into two sections. This was a memorable class and I can picture nearly all of the students. At the end of the semester, they presented me with a book *Fire Island*, which I have displayed in my book case ever since. Starting in 1990, due to a large number of students once again, we had two sections. I was joined by colleagues Judy Nesmith providing expertise with terrestrial invertebrates, Rick Simek leading the study in aquatic invertebrates, and Dorothy McLeer contributing expertise with mammal projects and interpretive and communication strategies.

In my mind, Field Biology is the epitome of experiential learning. Every Spring, during the most dramatic phenological changes of the year, the course is taught in an outdoor classroom and laboratory of living, breathing, photosynthesizing, metabolizing, mating, and reproducing plants and animals, fungi, and microbes, namely, in our Environmental Study Area. And a key component of the teaching/learning strategy is serendipity. We never have the same class twice. It is similar to the adage that you cannot step into the same river twice.

Each spring semester we observed the dynamic changes from the cold weather season through the vernal weeks to the summer solstice. The 6:00 a.m. section began the semester 20 minutes before sunrise and by the end of the semester, the sun was rising as we began class. We witnessed the dynamics of the incredible spring migration of birds which gather protein from the emerging insect larva which are feasting on the huge salad bar of tender leaves breaking bud. We also witness the timing between the insects gathering nectar and getting pollen on them to carry to sexually active wildflowers. Sounds like paradise to me. As a result, we developed a keen sense of place represented by southeast Michigan. Sounds like paradise to me.

Science courses are known for their “hands-on learning”. Well, Field Biology is a total experiential learning endeavor in addition to hands-on. It’s eyes-alert, ears-attuned, olfactory senses sniffing, tactile transmissions through finger nerve endings, and wet feet from early morning dew, not only hands-on but rained-on, mud-on shoes, and sun-on sun screen, and sitting-on concrete to study sidewalk crack plants. And finally, on the last day of the course, stimulating the taste buds with Lamb’s Quarters soup, Elderberry fritters, steamed male cattail flowers, sautéed Daylily buds, and salad with a variety of greens. We call it eating our Weedies.

Of course, as scientists making, recording and processing all our observations on adaptations of dozens of species and their interactive behavior with other species can be daunting. And yet, I am confident and pleased that we all came away from the course with

the view of world expressed by the esteemed scientist, Rachel Carson, with *A Sense of Wonder* at the world we live in.

The learning and teaching strategies demonstrated in Field Biology are applicable in habitats worldwide, even when the plants and animals are new to the learners. I had the privilege and pleasure of teaming with colleagues in Tamil Nada, South India 18 times to study and teach with students from North America and India on the **“Ecology of the Indian Tropics.”**

J. What did we learn in our Environmental Courses?

Much of my teaching focused on environmental issues (no surprise there). One of the courses I designed and taught was **Concepts of Environmentalism (ENST 301)**, which complements the basic Environmental Science course about how the world of air, water, soil, plants, animals, and energy works.

1. The goal of the Concepts course examines the issues behind the obvious or proximal environmental issues.
 - a. On the first day of class, (before reading through the syllabus and learning the dates of the exams) we worked in small groups to identify as many environmental topics and issues as possible in about 20 minutes. Collectively we put the issues on the white board until we had a list of 50 topics.
 - b. We stepped back, viewed the issues, and posed several questions.
 - i. How many more issues could we identify? Obviously, many more.
 - ii. How many courses have you taken in which you know this much about the subject matter even before you see the syllabus? This learning is situation called andragogy, a process by which students come to the course with considerable awareness and/or knowledge of the subject matter.
 - iii. “How do we go about solving each of these issues? . Of course, some of them are related and can be worked on together
 - iv. Typically, we use the traditional or classical method of problem solving, which is a tunnel vision approach.
 - We choose a problem. Recognize impacts, and hazards of each of these 50 issues of air or water or soil or disappearing species.
 - We bring the issue to the attention of the public and lawmakers
 - We pass laws to prevent pollution or to restore habitats
 - We establish enforcement procedures

- c. Using this tunnel-vision approach with each issue is overwhelming because each of these issues has its own interest group and lobbyists opposing change and regulation.
- d. Thus, we ask the question, are there some causes behind these issues that we can address and get at the root cause of all or most of these issues? That question brings us to the difference between proximal issues vs. ultimate issues the underlying issues or root causes of these proximal issues?

Could we make headway if we dealt with the ultimate issues rather than address each of the 50 plus issues on an individual basis?

- e. Thus, the first assignment for the students, due the next class period, required them to identify 3-6 ultimate issues behind these 50 proximal issues. In other words what are some root causes or ultimate issues that cause or drive all these problems?
- f. In the second class period, the students reassembled in the same groups, and shared their ultimate issues. If the students in the group had the same or similar ultimate issues, they wrote them on the board. Did we generate 25 or 30 ultimate issues from the original 50? No. Year after year the students generated similar ultimate uses behind the proximal issues. Invariably the results were:
 - Myopia, Historical Amnesia, Greed, Arrogance, Ignorance, and Tunnel-vision.
 - Myopia (short-sightedness) is in our DNA as part of our fight and flight for short-term survival.
 - Historical Amnesia means that forget the lessons learned from the past.
- g. How can we overcome our myopia and historical amnesia and extend our vision beyond the 24-hour news cycle, the weekly summary of the news, and the 2-4- 6 year election cycles? The issues that we deal will expand to encompass infrastructures which last for a 30-50 year time period (the life cycle of roads, bridges, and, pipelines , ecological process take place over 50 - 80 years which are required to develop soils for prairies, and restore wetlands, a geological time frames of 100 – 1000 years to replace and purify ground water, remove greenhouse gases from the atmosphere, maintain nuclear materials storage.

It's a challenge to be able to live in our society and remember the past while we consider to life for future generations.

- h. How do we solve the problem Greed? We are bombarded with incentives to consume more at the least expensive price. Where is the vaccine to overcome greed and substitute frugality and joy and happiness of relationships, with care, compassion and concern for others?

A quote from James Gustave (Gus) Speth, Top U.S .Advisor on Climate Change adds support to this ultimate issue. “Materialism is toxic to happiness, and we are losing our connection to the natural world.”

- i. Arrogance expresses itself in the attitude that we think we know it all and have all the answers. “Don’t worry we have that covered” is a common paternalistic response to questions of concern. Our pride and arrogance cause us to ignore the Precautionary Principle. If our University is a leader for change In our society, could we offer a concentration in humility as a solution to the ultimate issue and thus, deal with many problems simultaneously?

Again, a quote from Dr. Speth is appropriate

“I used to think that the top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that thirty years of good science could address these problems. I was wrong. The top environmental problems are selfishness, greed, and apathy,[the same thing our students realized by the second day of class] and to deal with these, he said, we need a cultural and spiritual transformation. And we scientists don’t know how to do that.”

A similar statement of confirmation comes from India’s first Prime Minister Mr. Nehru . He said “It is now clear that science is incapable of ordering life. A life is ordered by values.”

- j. When it comes to Ignorance as an ultimate issue, we at the University have live by the motto, “Stomp out ignorance.” And we know how to do it. We wish it were that simple.

Human beings are not robots. We look at the world through our spectacles of values and beliefs, for example some hold the belief by faith that, human ingenuity will solve any and all problems. Thus, we may claim that more education that provides the facts from science is enough to convince us. We know that is not true, witness the controversy about climate change and evolution. We need to look to the social, behavioral, and philosophy disciplines for important contributions to help us understand how our values and beliefs relate to humans understanding of how the world functions.

K. Wicked Problems

1. By now it is obvious that ultimate issues are different kinds of problems than pollution and energy consumption. These issues deal with a number of characteristics: <https://thewire.in/environment/climate-change-wicked-problem>
 - No one person or agency is responsible or accountable
 - The issues have no clear problem definition
 - The issues are socially complex
 - Multiple stakeholders are involved and they have conflicting agendas
 - The problems and solutions straddle organizational and disciplinary boundaries
 - Solutions are not right or wrong, but better or worse
2. These features characterize as Grand Challenges and also are more commonly called Wicked Problems.
3. This discussion brings to mind Harvard Professor Edward O. Wilson's statement that: "We are drowning in information, while **starving for wisdom**. The world henceforth will be run by synthesizers, people able to put together the right information at the right time [, think critically about it, and make important choices wisely."

In other words, now we need people who can put the world together instead of only taking it apart in our silos called disciplines, departments and programs. My name for this process of putting the world together is called a liberal education in which we become liberated or free to learn, work, and explore outside our "major" or "job description" or "think outside of the box." Interestingly, Wilson's description fit our campus when it became a four-year institution in 1971 and now it seems that the Covid-19 pandemic is directing our campus more rapidly in that direction once again.

L. Having said all this Leads Us to the question, "How do we see and relate to the world?"

Our behavior on planet Earth is vital and crucial for our long term survival. We have a long history of viewing the world ego-logically rather than eco-logically.

1. Commodity, (The world as commodities)

A dominant view sees the world as **objects or commodities** to be bought or sold. In Michigan, we saw forests as a means for financial gain and profit. Thus, the lumber barons cut down all the trees, except 42 acres at Hartwick Pines State Park, and sold them for lumber to build houses in Detroit, Grand Rapids, Flint, Kalamazoo, and most of the cities in our State. Subsequently, the land was sold as a commodity for production of wheat, beans, corn, and milk with names like Kellogg and General Mills.

David McCollough in his recent book *The Pioneers* resurrects this old poem from the Ohio River Valley.

*The axe, in stalwart hands, with steadfast stroke,
The savage echoes of the forest woke,
And, one by one, breaking the world-old spell,
The hardy trees, long crashing, with thunder fell.*

McCollough, David. 2019. *The Pioneers: The Heroic Story of the Settlers Who Brought the American Ideal West*, Simon & Schuster

Not only were the trees a commodity so was the land.

Quoting again from David McCollough “Henry Knox and Alexander Hamilton were investors in the Ohio Company for speculating on making money from the sale of the land in the Ohio River Valley.” From whom did they buy the land? Their money went into the United States Treasury as if it had the right to sell it out from under the First People. (Page 19, McCollough, *The Pioneers*)

As the Europeans moved westward and extirpated the beaver for hats, mined silver and gold for fortune, plowed the rich soil of the prairies and made a dust bowl. Now in Michigan, ground water is a commodity. sold in containers made from the commodity of fossil fuel.

Viewing our world as commodity is part of our country’s founding practices and heritage.

2. Resource

As second view of the world is as resources for our consumption. The view is confirmed in the account of *The Pioneers* by David McCollough, who states that the new arrivals “at the confluence of the Ohio and Muskingum rivers would not only provide timber aplenty for houses and boat building, but were a sure sign of fertile soil.” The trees and soil, along with the water and air were seen as resources for consumption or for deposition of “waste” For a local example, the Rouge River was viewed as a resource for the deposition of sanitary and industrial wastes.

A former resident, living near our campus, recounted to me how people who lived on the bank of the Rouge River had their outhouses perched on the end of a dock above the river. That image may seem disgusting. But keep in mind, outhouses were common throughout the area before installation of sanitary sewers. Yet, when sewers were installed after 1940 (Johnson, 2011) to carry sewage to large underground sewers, called interceptors, they

were not large enough to carry all the wastewater during heavy rainstorms. Consequently, sewers backed up into basements. The solution called for combined sewers of rainwater and sanitary wastes to be discharged directly to the Rouge River during heavy rain events. Over time 152 of these sewers (Beam and Braunscheidel, 1995) were installed and all the above substances and materials that could float flowed into the Rouge River during a heavy rain. Today, more than half of these combined sewer overflows or CSOs have been closed. Yet, in actuality, thousands of our houses and business had their “outhouses” on the river because we see the Rouge River as a resource. Likewise, we viewed the air as a resource for disposal of wastes as well. This sequence of actions and decisions also illustrate the axiom that “today’s solution can be tomorrow’s problem.”

More recently, Klaus Schwab, the founder and executive chair of the World Economic Forum which meets in Davos-Kloister in Switzerland described our atmospheric resource as follows:

“The economic boom of the past 75 years came at a high price: almost all of the CO₂ “budget” the world had to avoid catastrophic warming is now used up”. In other words, the atmosphere is full of CO₂. “If we want to avoid even 2° of warming, the next generations both in the U.S. and around the world will either have to stop leading the energy-consuming lifestyle of their parents or Western peers altogether—or come up with clean alternatives in less than a decade.”

In other words, we used the atmosphere to deposit our carbon dioxide and other “so-called” waste materials until we have filled the air without regard to the Law of Conservation of Matter. If we take carbon from the ground, it has to go somewhere. If we remove the recyclers of carbon by deforestation, the carbon over fills its atmospheric budget.

3. Gift

A third view of the world comes from the description of Robin Wall Kimmerer in her book “Braiding Sweetgrass.” Dr. Kimmerer is an ecologist at the State University of New York-Syracuse. She is a member of the Potawatomi tribe of First People of the continent. She describes the living and nonliving world as a **Gift** from the Creator Sky Queen.

How does a world of “gifts’ compare to a world of commodities and resources? I grew up believing that commodities and resources were legitimately up for grabs by the “firstest with the moistest’.

Suppose someone offers you a gift of freshly-picked green beans from their garden, or a bakes birthday cake in your honor. Or gave you their painting of the sun setting down Jensen’s Meadow in the notch of the trees over the lake on June 21. Would you see these

as a commodity and part of a market economy? Would you immediately think about how much money you could get if you sold those items? Would you use the painting and its frame as resource material to kindle a fire in your fire place or BarBQ pit?

When we receive a gift, we give a sincere thank you to the giver. In addition, we likely will return the favor and give something to the giver that we know that he or she will value. As a result, we may enter into a relationship with the giver and become a friendly neighbor, or co-worker, Thus, we will have a relationship of reciprocity. In the Potawatomi culture, a gift is something that you make and that fits with the person's preferences and likes.

Can we even imagine contemplating, as an experiment, looking at our planet, Earth, its creatures, and processes of precipitation and evaporation as gifts, and not as commodities or as resources. For decades we have been overwhelmed with the market economy of money and the world as commodities for sale and profit or the resources for consumption without payback.

Our leaders are trying to give us hope by getting the economy back to "normal" and grow. According to Vaclav Smil in his book *The Frightening Specter of Endless Growth*, he claims our worship of the concept of eternal growth has become a religion and our obsession to "to get the economy back to "normal", will continue the liquidation sale of our planet, and continue to produce great inequities.

In a gift economy, we will be giving back as we take from the world. In our current economy, we need to examine when our taking is outright thievery from our next generation or even the next seven generations as the First Peoples caution us.

In a gift economy, we do not have a "bundle of rights", rather it comes with a "bundle of responsibilities" and our currency will be reciprocity.

About 100 years ago Aldo Leopold wrote "We abuse the land because we see it as a commodity belonging to US. When we see land as a **community** to which we belong we begin to use it with love and respect.

In our study of ecology, we examine the living communities of plants and animals within ecosystems. A community has communion between its the species. Of course, they do not speak with each other, but are we open-minded enough to recognize that interactions of the fungi transmitting chemicals among the roots of herbaceous plants and trees as described by Dr. Suzanne Simard of the University of British Columbia in her research, is commune-ication.

In a reciprocal society, we will have interactions between people that will develop into communities with citizens who commune or commun-icate and feel at one with the “other”, or “be in touch” with each other.

To paraphrase Dr. Kimmerer, From the very beginning of the world the species were our life boat. Now that we have entered the Anthropocene, we must be theirs. But do we know them well enough to save them? Are we humble enough to understand that we are part of their “community” and can we commune or commune-icate with them?

Clearly, citizens who view the world as a gift, will take care of the gifts. Lewis Hyde, a scholar on gift economies and the creatures with which we commune-icate “their world will remain plentiful **because** it is treated as a gift”. We do not trash and toss out gifts.

Let’s try to relate our biological communities to our urban habitats. Can we design our urban “forest” of trees, our parks and parklands, our residential landscapes with the lawns, the greatest monocultures of our country, to commune each other and with our rivers, lakes and streams in reciprocal relationships?

Although the concepts of reciprocity and communing with non-human creatures may appear to be utopian idealism, are you willing to bet that in 100 years from now we may still view our world as what we now call “normal”? Will we have the humility and courage to explore and expand how we “Know” of the world beyond the realms of science and discover knowing the world through the arts, the humanities, and philosophy?

M. Reciprocity and Sustainability

Coming back to the present time, living in a world of reciprocity sounds a lot like the popular and important concept of Sustainability. Today, we emphasize the goals of sustainability, which includes zero net carbon emissions, and give a hypocritical nod to the Law of Conservation of Matter by recycling some of our “stuff”. Sustainability is a necessary goal if we wish to live within the bounds of the only planet we have to live on. Nevertheless, in a conversation with a faculty colleague who teaches economics and agrees that we need to head toward a sustainable society, he quickly added, “we do not know how to do it.” Thus, we continue to act as colonists rather than natives, takers rather than reciprocators.

To me, the concept of the world as a gift is remarkably similar to the Judeo-Christian account of the Creation. Again, the Potawatomi view has the Skywoman Queen falling out of the darkness to establish the diversity of life on Earth and give it the attributes of a gift to be treated with reciprocity.

N. Judeo-Christian View

The first Hebrew account of Creation also gives humans a great deal of responsibility for living properly in and with the gifts of the Creation. They were expected to follow their commission of dominion (but not domination) and charged to rule with respect, justly, and fairly as their kings were required. In the second account of the Creation, (Genesis 2:15) Adam whose name in Hebrew comes the word Adamah, which means of the earth, is given the responsibility to till and to keep the garden. Examination of the Hebrew words for “till” and “keep,” can be similar to taking care of a gift. The word “till” is “*abad*” which is the root of the word “to serve.” in other words, to serve the garden with a life of service or con-serve. The word keep in Hebrew is “*shamar*”, which translates as keeping for the good and for benefit of the that which is being kept and not necessarily for the benefit of the keeper. In essence, the keeper is the steward or the trustee of the garden. Obviously, the garden keeper or Earthkeeper will benefit as will the garden if there is relationship of reciprocity. I think this is an eloquent interpretation of the meaning of the relationship of humankind to the Creation in which we live.

Because of our behavior of abusing the created order with a commodity and resource worldview, we are now taking responsibility for restoration. The discipline of restoration ecology is an important and large vocation and calling. In addition to paid careers, thousands of people of all ages serve as volunteers to restore the habitats, water, soil, and species of plants and animals throughout the world. We are deeply grateful for the volunteers who restore our Environmental Study Area on Stewardship Saturdays. Again, volunteers are the heart and souls of Friends of the Rouge, which was founded on our campus and where many of our alumni serve on its staff and Board of Directors. Similar organizations such as the Friends of the Detroit River, Southeast Michigan Land Conservancy, the Michigan Botanical Club, The Greening of Detroit, Detroiters Working for Environmental Justice, and dozens more in Michigan benefit from the reciprocity of volunteer and servant leaders. at eco-usa.net.orgs.mi.shtml

According to Klaus Schwab, who wrote “The Youth have a Right to be Angry” states: “The median age of the world is less than 30 years old, which means that young people are actually the most important—and most affected—stakeholders when talking about our global future. These are also the people who have the most innovative ideas and energy to build a better society for tomorrow. [And now listen to this, it’s from an economist.] We should move away from a narrative of production and consumption to one of sharing and caring. Young people are the best placed to lead this change. Let’s give them that opportunity.”

Even if we live sustainability in the world as a gift economy, I have often asked the students, for comment on another question. Why bother? Is there is reason or a purpose for everything? Or as Francis Collins, the Director of the National Institutes of Health, asks

“What is the purpose of all of this life? It’s a question science cannot answer.” But it’s a question we face continually.

I will conclude with thoughts written by an acquaintance, Dr. Larry Rasmussen, a social ethicist at Union Theological Seminary.

“Early on, when time and earth were yet young, they all gathered about dawn, the dragonflies and blackbirds, the Swedish ivies and Boston ferns (though they weren’t yet sure about Sweden and Boston,) the tyrannosaurus rexes and the duck-billed platypuses, a lion and a lamb, a woman heavy with child and a shy young man, and of course, the elder among them--- Venus the morning star. They waited. They all waited to see if it would happen again. With growing impatience, they waited. And waited ever so long. Finally, it happened. They broke into applause, grabbed one another by the arm (or wing, or frond, or whatever) did a joyful jig, and sang a funny-sounding song. It had really happened again. The sun had come up one more time. An in almost the very same place. Morning had broken just like the first morning. As was now their habit, they elected a Village Philosopher for the day and retired to the daily session of the Primitive Theology Brunch Bunch Discussion Group. It had one and only one question that it loved to contemplate: Why is there something rather than nothing? And the glow of the astonishing occurrence – the rising of the sun – stayed with them the day long.

“But soon some grew bored. They quit coming to the regular midmorning discussion group with its one and only question. They quit gathering at dawn. Some claimed an inalienable right to sleep in. Soon they quit applauding and dancing and singing. There were other things to do ---toil, reap, cook complain, invent aspirin, suffer ulcers and coronaries. God continued doing only wonders, but no one noticed. They would wake up alive but fail to be astonished at that: see one another, alive and well, but hardly let the mystery of it all register; eat and drink and kiss good-bye breathing, laughing crying singing, working, dying---it all went on. God kept doing only wonders, morning like the first, but no one gathered to feel creation anew. They even forgot the question they loved to contemplate. Why is there something rather than nothing?”

Well, I’ll conclude, with a less provocative thought but still a sobering epiphany I had that after 50 years at the University of Michigan-Dearborn, I now realize that I have fewer days to live than I have lived. Often in discussions about end-of-life issues, people ask one another what they would like to have people say about them at their funeral while they are standing by their casket paying their respects. That’s a difficult question. Yet I would hope that for me at least one person would say, “HEY, LOOK, HE’S BREATHING.” It’s been a wonderful and inspiring time connecting to all of you and thanks again to those who made this opportunity to serve at the University of Michigan-Dearborn possible.

Best wishes to you all.