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MOLECULES TO MORALS- SUSTAINABILITY AND EDUCATION

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Education: Destructive or Constructive?

"When will Uncle Joey be here, Daddy?" For about the tenth time in as many minutes, my three-year-old son, Vinny, asked the same question. "Soon," I answered. Again. "Let's sit under this oak and watch the road for his car." Watching, and diverting Vinny's excitement, gave me the opportunity to savor a part of this delightful May morning. Vinny made designs out of the many acorns lying about. I took in the symphony of nature. In this part of rural Western Pennsylvania the weather had finally turned warm and dry. The fields and forests surrounding our home were a buzz with chattering squirrels, sparrows and nuthatches, and in bloom with prized trillium and wild cranesbill. The trees were greening just as God scheduled.

Soon, Uncle Joey arrived. We decided to take a walk to allow him to stretch his legs and to revel in the wonders we see daily, but are not customary to him. Our trail starts in our backyard and follows a lazy meander through the surrounding terrain. Vinny was showing off his recently acquired ability to identify many of the trees that are native to this forest: red maple, sugar maple, sassafras, tulip poplar, cherry, and various oaks and hickories. Joe was impressed. There are only two types of trees Joe claimed he could identify: Christmas trees and non- Christmas trees.

The hike put Joe into an impish mood. He jumped to grab a small cherry branch that was hanging over the trail. The limb broke into Joe's hands. Connected to the fallen bough was a three-foot strip of bark. Joe continued down the path with the now orphaned branch and bark in hand, banging them on "any old" tree trunk along his way. He was unaware of his scarring. Most likely the cherry and its neighbors would recover from the desecration: they were healthy trees. I stared at the initial wound and at Joe's back as he walked farther. Vinny brought me back to reality with his question: "Doesn't Uncle Joey know the tree is a living thing?"

Joe is my best friend, a man I have loved dearly for years. My children refer to him affectionately as “Uncle” though he is not really. He is, however, a successful attorney who earned straight A’s all through school. As much as I admire him, I believe his education left him disconnected from nature. I know mine did. I also believe there are millions of educated people who are similarly alienated from the natural world partly because of their academic experience. If my hypothesis is true, this situation has serious environmental repercussions. I find it particularly interesting that Joe graduated with honors from a Catholic university. I, by the way, have never mentioned to him my thoughts about the cherry tree.

I am a chemistry professor at a different Catholic university. The seemingly innocent incident with Joe caused me much wonder. What role, I asked myself, have I played in educating “Uncle Joe’s” such that they are disconnected from nature. I did not like my answer. As a result of my soul-searching, I am learning how to teach in a more environmentally responsible manner. My formal education did not equip me to teach this way. It exposed me to little outside my discipline of chemistry. Consequently, I spend a fair amount of time as a professor educating myself in non-chemistry areas so that I can be a more responsible educator.

Where does this time come from? From the time I spend with my family? Or must it come at the expense of my research productivity? If it comes from my research productivity, how will the university promotion and tenure committees view this?

A few weeks ago I was at a meeting at the university with three senior faculty members and a senior administrator. We ‘gossiped’ about a recent tenure decision: a good teacher was denied tenure because there was not enough evidence of research productivity. Somebody at the meeting said that it is a shame the system has to be that way.

Of course, the truth is that the system doesn’t have to be this way. The educational system is a human construct. The values and perspectives that academia promulgates are derived by a series of choices. Sometimes I think we educators forget that these choices partially shape the worldview of our students. Institutional problems that can inadvertently negatively affect student worldviews must be addressed: particularly at Catholic institutions.

An Opportunity for Educational Reform

I believe that *Ex Corde Ecclesiae*, Pope John Paul II’s Apostolic Constitution on Catholic universities, is a wonderful invitation for Catholic higher education to reflect upon how it shapes students’ outlooks. The essence of *Ex Corde Ecclesiae* reminds us that reality, as faithful Catholics, is different than depicted in contemporary culture. Reality is both temporal and transcendent. Also the human person is different than depicted by current mass media. The Catholic view of humanity recognizes we all have hearts, minds, and souls. Therefore, Catholic schools need to be educating their students appropriately. Even in science courses.

That science and technology can affect the whole person is not a new idea. George N. Shuster, in his introduction to my edition of John Henry Newman's classic *The Idea of a University*, writes:

As for science, he (Newman) foresaw with extraordinary keenness what the future would bring. There could be no real collision with Catholicism. But the scientist might well be so enamored of his methodology that, looking for the truths of Revelation at the other end of the microscope, he would become blind to the fact that the ways of the soul are not that of the laboratory... It was for this reason, Newman surmised, that the scientist could be tempted to become, like Julian the Apostate, the mere philosopher...In short, they (scientists) would turn round the axis of the human self and not round the Divine Center of the Universe." (Newman, 1959)

Clearly, Newman sensed the power of science, upon the individual and with society at large, to divert our focus away from God and toward the material fruits of science and technology. Newman's fear is exemplified in the words of the leading scientist of Newman's time, Louis Pasteur:

Take interest, I implore you, in those sacred dwellings, which one designates by the expressive term, laboratories. Demand that they be multiplied, that they be adorned. These are the temples of the future, temples of well-being and happiness. There it is that humanity grows greater, stronger, better.

It is not surprising that Newman would recognize this dangerous aspect of science based upon his vision of the university:

What an empire is in political history, such is a university in the sphere of philosophy and research. It is, as I have said, the high protecting power of all knowledge and science, ... it maps out the territory of the intellect, and sees that the boundaries of each province are religiously respected, and that there is neither encroachment nor surrender on any side. It acts as umpire between truth and truth, and, taking into account the nature and importance of each, assigns to all their due order of precedence." (Newman, 1959)

Newman's view of the university is at odds with the university of today. Most academics now subscribe to the notion of the university being merely a market place for ideas. The academic community objectively self assesses the intellectual merits of ideas with various ideological and sociological lenses. The ideas that survive this process set the intellectual milieu of the academy.

I believe a significant factor explaining these conflicting notions center on differences in the concept of truth. Newman viewed truth as both secular and sacred and viewed the human mind as being made for this truth:

...the arts and sciences as practiced in Newman's day were taken by him as the main ways to acquire knowledge about the world around us. The main way one arrives at religious truth,

however, is through reason and revelation (Scripture, Christian tradition and the individual human conscience). (Sire, 2000)

Clearly Newman's view of truth is not the current norm. In fact, a hundred-plus years after publication of *The Idea of the University*, John Paul II was compelled to write, *Veritatis Splendor*. In this encyclical, the Pope reminds us that "Truth enlightens man's intelligence and shapes his freedom, leading him to know and love the Lord." This encyclical reaffirms the church's moral teachings and examines the philosophical currents that have led contemporary culture to reject Newman's concept of truth (and conscience) and consequently dissent from church teaching. Charles Malik has implicated the worldview of both the sciences and the humanities as being antithetical with a Christian worldview. Malik notes that part of the problem is that philosophically both spheres of inquiry make no reference to anything genuinely transcendent. In essence, the sacred has been stripped from the truth. In addition, Malik reminds us that the influence of universities:

is so pervasive and total that whatever problems afflict them is bound to have far reaching repercussions throughout the fabric of Western civilization. (Malik, 1987)

Nonetheless, we must also remember that the cultural influence of the universities can also be for the good. The spirit of *Ex Corde Ecclesiae* is to encourage Catholic institutions to provide a cultural corrective for the many currents of modern thought that are contrary to the Catholic worldview. No doubt this is an extremely difficult challenge that may take several generations of diligent effort by faithful, dedicated faculty before any headway is noted. Every discipline in a Catholic institution needs to be involved in what Malik calls "the overall articulation of all truth." It should be abundantly clear to students of a Catholic institution that there is truth and that truth has both temporal and transcendent dimensions. Also that there is a hierarchy of truth and a truth in theology does not belong to the same order as a truth in chemistry. The truth of the disciplines needs to be continually put into its rightful place along with the Truth of Jesus Christ. Newman's view is that a Catholic university acts as umpire between truth and truth. In addition, Newman reminds us that

if there be religious truth at all, we cannot shut our eyes to it without prejudice to truth of every kind, physical, metaphysical, historical, and moral; for it bears upon all truth. (Newman, 1959)

From Newman's perspective Catholic science education would situate the truths of the physical world into a holistic Catholic setting. Such an educational approach should not be limited to science education. It is much easier to connect subjects such as economics, literature, history, and sociology to a Catholic worldview. Unfortunately, the current practice of disconnecting knowledge from a comprehensive moral framework will likely create extreme societal upheaval in the age of biotechnology.

Catholic Science Education

I have changed the way that I instruct my university core chemistry course in response to *Ex Corde Ecclesiae*. My teaching goals have been altered from early in my career when I tried to “create” chemists in one semester. Now I have three objectives: to use chemistry as a tool to teach respect for all of creation; to use chemistry as a lens to examine the affect of science and technology upon the whole person and our culture. My final goal is to articulate throughout my course that there is truth, and truth is two fold: both temporal and transcendent.

In order to achieve my first goal, I weave in selections from Aldo Leopold’s classic *A Sand County Almanac* to augment my chemistry lectures. My class reads portions of this masterpiece, which is the poetic fruit of a lifetime of experience, contemplation, and exhortation by arguably the twentieth century’s premiere conservationist. An important aspect of Leopold’s writing is his ability to use poetic language, which speaks to the soul and conveys his visceral love for the natural world. I know of no better spokesman for the grandeur of nature. For instance, take “Axe-In-Hand,” one of my favorite essays,

November is, for many reasons, the month for the axe. It is warm enough to grind an axe without freezing, but cold enough to fell a tree in comfort. The leaves are off the hardwoods, so that one can see just how the branches intertwine, and what growth occurred last summer. Without this clear view of treetops one cannot be sure which tree, if any, needs felling for the good of the land.

...

I find it disconcerting to analyze, *ex post facto*, the reasons behind my own axe-in-hand decisions. I find, first of all, that not all trees are created free and equal. Where a white pine and a red birch are crowding each other, I have an *a priori* bias; I always cut the birch to favor the pine. Why? ...

The only conclusion I have ever reached is that I love all trees, but I am in love with pines. ...

I find my biases more numerous than those of my neighbors because I have individual likings for many species that they lump under one aspersive category: brush. Thus I like the wahoo, partly because deer, rabbits, and mice are so avid to eat his square twigs and green bark and partly because his cerise berries glow warmly against November snow. I like the red dogwood because he feeds October robins, and the prickly ash because my woodcock take their daily sunbath under the shelter of his thorns. I like the hazel because his October purple feeds my eye, and because his November catkins feed my deer and grouse. I like the bitter-sweet because my father did, and because the deer, on the 1st of July of each year, begin suddenly to eat the new leaves, and I have learned to predict this event to my guests. I cannot dislike a plant that enables me, a mere professor, to blossom forth annually as a successful seer and prophet. (Leopold, 1970)

My second teaching goal is explored by examining the science and technology of agriculture. We study the chemistry of soil, fertilizers, herbicides, pesticides, and genetic engineering. These topics naturally lead to the topic of sustainable agriculture. It was been my experience that the best way to teach sustainable agriculture is to contrast my scientific presentation with a good “Catholic prose” discussion. Ironically, the “Catholic prose” that I use to mediate this topic is by a non-Catholic, Wendell Berry.

Wendell Berry, writer, poet, professor, and farmer is one America's finest chroniclers of contemporary rural life. The following excerpt from his work provides powerful testimony how excessive concern with agricultural efficiency has negatively impacted many rural communities:

few people whose testimony would have mattered have seen the connection between the "modernization" of agricultural techniques and the disintegration of the culture and the communities of farming-and the consequent disintegration of the structures of urban life. What we have called agricultural progress has, in fact, involved the forcible displacement of millions of people.

I remember, during the fifties, the outrage with which our political leaders spoke of the forced removal of the populations of villages in communist countries. I also remember that at the same time, in Washington, the word on farming was "get big or get out"-a policy which is still in effect and which has taken an enormous toll. The only difference is that of method: the force used by the communists was military; with us, it has been economic-a "free market" in which the freest are the richest. The attitudes are equally damaging, not just to the concerns and values of the human spirit, but to the practicalities of survival.

And so those who could not get big have got out-not just in my community, but in farm communities all over the country. But as a social or economic goal, bigness is totalitarian; it establishes an inevitable tendency toward the one that will be the biggest of all. Many who got big to stay in are now being driven out by those who got bigger. The aim of bigness implies not one aim that is not socially and culturally destructive.

And this community-killing agriculture, with its monomania of bigness, is not primarily the work of farmers, though it has burgeoned on their weaknesses. It is the work of the institutions of agriculture: the university experts, the bureaucrats, and the "agribusinessman," who have promoted so-called efficiency at the expense of community (and of real efficiency), and quantity at the expense of quality." (Berry, 1986)

After the class has read some of Berry's works I introduce them to a recent pastoral letter by the Nebraska Bishops that states:

In the Catechism of the Catholic Church one finds this very fundamental teaching: "Economic life is not meant solely to multiply goods produced and increase profit or power; it is ordered first of all to the service of persons, of the whole man, and of the entire human community." [#2426]

With this introduction my class is now ready for a discussion centered on how we decide whether we ought to do the things that science and technology allow. I believe that such a holistic approach, from molecules to morals, is Catholic science education at its best. As Newman would say, the fullness of truth is illustrated and Truth can mediate truth.

My third teaching goal is to weave wherever possible into the class the two-fold nature of truth: it is both objective and transcendent. If we are not careful science can confuse this issue. I use the following from *A Sand County Almanac* to explore this topic:

Science contributes moral as well as material blessings to the world. Its great moral contribution is objectivity, or the scientific point of view. This means doubting everything except facts; it means hewing to the facts, let the chips fall where they may. One of the facts hewn to by science is that every river needs more people, and all the people need more inventions, and hence more science; the good life depends on the indefinite extension of this chain of logic. That the good life on any river may likewise depend on the perception of its music, and the preservation of some music to perceive, is a form of doubt not yet entertained by science. (Leopold, 1970)

This passage serves to remind us that science is not value-free. In addition, the class explores the ways in which "scientific objectivity" can undermine traditional cultural repositories of morals and values such as religious traditions. Science can also inadvertently distort the two-fold nature of truth. Consequently, it is critical today that the entire Catholic educational enterprise point out the existence of both temporal (objective) and transcendent truth.

This idea occurred to me last year in a poignant way after the Mass celebrating my son's graduation from our parish kindergarten. During Mass, the class stood next to the altar during the consecration. Later Vinny told me that this is as close as he has ever been to the Miracle. These kindergarteners clearly believe that a miracle occurs at Mass during the consecration. The kindergarten class of 2001 has been taught and understands there are temporal and transcendent dimensions to truth. My prayer is that all academic departments in Catholic institutions will be proclaiming this reality when these kindergarteners arrive on campus 11 years from now.

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Endnotes

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