

ON SCIENCE: LIMITATIONS & DISTORTIONS

By Ken Olson Lewistown, Montana August 2021

“Art is limitation; the essence of every picture is the frame.”

G. K. Chesterton

“The model we choose to understand something determines what we will find. ...Our first leap determines where we will land. If we assume a purely mechanical universe and take the machine as our model, we will uncover –surprise, surprise– the body, and the brain with it, is a machine. To a man with a hammer, everything begins to look like a nail.”

Iain McGilchrist

Contrary to our casual ways of speaking, there is no such thing as “Science” in general, and neither is it correct that “Science says.” Science is a method before it is a subject. It is a certain procedure designed to analyze and uncover particular facts in the material world. Thus, there are many so-called “sciences,” areas of study wherein it is fitting to *apply* the scientific method and its physical tools. There are university departments with classes that teach the facts and procedures in such courses as chemistry, physics, microbiology, and the like. Nearly always, the method is rightly employed and works well to confirm known facts and to discover new ones. However, the attempt is sometimes made to enlist “science” for support in areas for which it is ill-suited and inappropriate. There is a line between use and abuse.

Tradition has it that over the door of Plato’s academy in the 4th century B.C. was inscribed the admonition: *Ἀγεομερατος μεδεις εισιτω*. “Let no one ignorant of geometry enter here.” The American Mathematical Society, founded in 1888, followed suit and put those words on their emblem, along with Greek columns. (I included the Greek script, simply because it is *beautiful*.) Plato was not saying, “We are only going to talk about mathematics,” and his was not a mathematical institute. Rather, he put the statement at the entrance, because geometry is eminently logical, and that sense was needed *before* you could think and discourse about his main concerns, which were philosophy and theology: the Good, the True, and the Beautiful.

Logic is a prerequisite for meaningful discourse on just about anything, and that surely includes the sciences. However, we now have the phenomena of a number of outspoken biologists and physicists who are competent within their own disciplines, but who imagine that they are, *thereby*, qualified or competent in other issues, including things philosophic. (To be candid, it reminds me of the television commercials of a Football Hall of Fame quarterback who is presented as an expert on various brands of blue-jeans, and of another, whom we are asked to trust concerning Medicare supplement insurance plans.) Thus, one might say that many of such scientists are “in over their heads.” It is not too much to suggest that some are *scientific* fundamentalists, those who make what is known in philosophy as a category mistake. In this case, it is to be of the opinion that science is omniscient, that there is only a single kind of truth, scientific, and if something doesn’t fit within the narrow inquiry modes of science, then it can provide no truths, whatsoever.

Some years ago, I got a note from Peter Dodson, one of the world's leading paleontologists. He was in China and had conversed with a young graduate student in paleontology who said that he fully accepted the truth of evolution but had been told that this required him be an atheist. The idea may have come from representatives of the government, with their premise that China is an officially atheistic state. (The fall of the Soviet Union has left very few with that designation, the main ones being China, Cuba, and North Korea, those that have 1984-type ideas on human rights, criminalizing possessing a Bible or watching the wrong video.) The student also could have received the idea from other scientists who held to the thoughtless equation that evolution = atheism. Of course, that is *not* something that tumbles out from any scientific equation, and Dodson, a devout Catholic, made that clear. There is not, nor can there ever be, any evidence that God does not exist. Yes, you can do a strong scientific case against some caricature, such as "the Little Old Man on Cloud Nine," but that's simply a travesty of what religions have meant by the reality of God. As Chrysostom said in the 4th century, "A god comprehended is no god."

Not long ago, I took note of an internet blogger, an atheist who was filled with hostility and who was certain that it was a teaching of Christian Faith that all the evil in the world exists "because a talking snake tricked two people into eating a piece of fruit." For him, it was a chance to ridicule "the goat herders" who came up with such an absurdity. First of all, when that writer's ancestors (mine, too) were living in huts and caves in Northern Europe in 1,000 BC, those so-called goat-herders were building Solomon's Temple in Jerusalem. There are literalist fundamentalist Christians who can be ridiculed after the fashion of the blogger; but that writer was stunningly ignorant of any religious perspective other than fundamentalism. Like many others, he is ignorant of literary forms employed by ancient cultures and of what the Eden story, in picture-language, not only *says*, but what it *means*.

There are a number of reasons why people adopt the view of fundamentalist creationists. One, of course, is simply the fact of being raised in such a home. Also, fear of change and the felt need for authority, are contributing factors. However, another reason is the fact that many of them *have* encountered the sort of scientists, or least have read about them, who *do* speak and act as if truth is of a single kind, and that what can be seen and measured and quantified by science is *all* that exists. Their own experience tells them otherwise, so they recoil from the findings of science.

The distortion that equates reality that which can be known by the scientific method is often sold as being realistic, but is, instead, what is known in philosophy as "*naive realism*." It is the simplistic view that everything is merely particles and waves of energy, because all that the tools of science can detect is matter in motion. It's really materialism and reductionism, wherein a huge (and unjustified) leap has been made from methodological procedures in one discipline to ontological conclusions in others. Thus, most philosophers see that sort of scientist as being extremely ill-informed. For, consider the fact that scientists, by their own standards, with their own methods, cannot even *look* for purpose in the elements they study, something that invalidates that supposed conclusion that "Science *knows*" that the idea of God is illusory. So, the famous physicist Steven Weinberg has the opinion that "The more we find out about the universe, the more it seems to be pointless." --Well, duh-- if he expects his

scientific methods and models dealing with matter and energy to provide answers to his questions regarding something as intangible as purpose. Eugenie Scott, the evolutionist who directed The National Center for Science Education for a number of years, rightly offers this reminder to her colleagues: “Science is not equipped, methodologically speaking, to tell us whether or not there is any ‘point’ to the universe. If scientists undertake nevertheless to hold forth on such matters, they must admit that their declarations are not scientific declarations.”

The science writer Timothy Ferris, in *The Sky of Mind: Human Intelligence in a Cosmic Context*, describes “naïve realism,” as being:

“...the dogged assumption that the human sensory apparatus accurately records the only real world. To the naïve realist, every view that does not fit the official model is dismissed as imaginary ...or insane....Naïve realism is flattering –to set oneself up as the sole judge of what is actual is to taste the delights of godlike power—but it is also stultifying. ...The truth, of course, is that nobody can grasp reality whole. ...Everything thus is framed, cut from its cosmic context by the limitations and peculiarities of our sensory apparatus, the prejudices of our presuppositions, the multiplicity of each individual mind, and the restrictions of our language.”

Please Note: Most scientists –likely millions of them-- are not confused on this issue. They do not presume that science is omniscient and omniscient, and this essay is not about them. However, these days, some scientists do have this presumption, and they, of course, are the vocal ones. In a time when science is under attack from the irrational religious and political Far Right, those of us who strongly support the findings of science are perhaps hesitant to offer critiques of any sort. However, to overlook distortions or perversions is no service. Both are needed: supporting established science and calling out those who claim the support of science in an illegitimate fashion; otherwise, in the long run, authentic science is damaged.

Clouding the issue are also various forms of pseudoscience, those having to do with astrology, Atlantis, psychic healing, the Bermuda Triangle, pyramid power, UFO sightings, and such. However, there’s also an ignorant misapplication or abuse of plain scientific facts. As an illustration, consider an article by a person named Meghan Leslocky on a CNN website some time ago that got “tons” of (vulgar) agreement. She wrote that monogamy is unnatural –it may or may not be, but here’s her rationale-- *because, Penguins are promiscuous*. “We are animals,” she said, “so it makes sense to look to them to understand our behavior.” “Never mind” that Eagles, Ravens, Canada Geese, Mourning Doves, Atlantic Puffins, Great Horned Owls, Sandhill Cranes and many other birds, unlike Penguins, mate for life. (It’s difficult to escape the idea that she is looking for a way to say that adultery is A-OK, although I wonder if it would be, should another woman seduce *her* husband.) And if the animal kingdom is our model, then, by logical extension, why doesn’t Leslocky say that rape is just fine, too, because there are any number of creatures who practice that. For example, the male Mallard duck in the pond: a very violent bird in such matters. It would be a severe contortion of the imagination to say that its mode is *amore*. And then there’s the fact that some Penguins --her model, remember— are into necrophilia.

Of course, the writer was “cherry-picking,” or employing the so-called rubber ruler that is stretched to provide a standard to justify what she wanted to say, in the first place. Another

image also comes to mind, that of Procrustes, the son of Poseidon in Greek mythology. He was a metalworker, a thief and a murderer, who had an inn that featured an iron bed. He offered travelers lodging, but they seldom fit the bed, so he disjointed the shorter ones on a mechanical rack and cut off parts of the legs of the taller ones. In every case, the weary guests paid Procrustes with their lives. In line with the myth, inept or wrongful comparisons do violence to what is real and true.

In addition, if we're going to justify certain aspects of human behavior by making analogies to the animal world, shouldn't it "make sense" that we turn to Primates, instead of to Penguins? After all, Chimpanzees are our closest relatives, with whom we share 98.4% of our genetic material. "What's good for the chimps is..." However, as Jane Goodall discovered, chimps make war on neighboring tribes, kill their babies, and eat them. Because in nature it is a commonplace that the strong will prey upon the weak, should *that* be our pattern? The Nazis thought so. Evolution, to them, was all about "the survival of the fittest," the domination by the strongest, and that was exactly who they claimed to be. (Thomas Huxley, Darwin's principal advocate, said he was appalled by similar ideas in his own time, by those who sought to justify man's inhumanity to man: "Whether man is *from* the brutes or not, he is assuredly not *of* them." He affirmed that humanity's ethics require that "we are not to *imitate* the natural order but, instead, to *combat* it.") The writer of the CNN blog closed her article by saying she was "just a woman with a healthy respect for science." Hardly. Rather, she is one more among many who are abysmally uninformed concerning the scope, methods, and limitations of science: one more who has jumped on a popular bandwagon that distorts and abuses science by ignorant extrapolations in order to ridicule religion and disparage conventional morality.

Again, fundamentalist creationists have heard of such presumptuous declarations by atheists claiming science supports their view, or they have encountered, if not scientists themselves, then sophomores, of whatever age, who have been overawed by science and act as if it explains *everything*. The chemist Peter Atkins of Oxford says exactly that: "We are hiccups on the way from one oblivion to another. ...We hope that through the scientific method we will understand absolutely everything. ...Science is the only way of acquiring reliable knowledge." Believers have a proper intuition that what is being left out in such pronouncements are not the marginal but the central things about humanity. Understandably, they might begin to regard science in general as not just incomplete, but arrogant, misguided, and possibly dangerous. (They know about the Nazis, too.) I do think that this helps to understand the growth of fundamentalism. (However, the *next* stage of the fundamentalists' reaction is misguided and, I think, hugely ignorant, in that they imagine the Bible to be an authority on almost everything, too, a "Perfect Book" and, by interpreting it literally, posit the 6,000-year-old earth, the Flood, etc. against the findings of science. My essay, *Ignorance in Religion and the Wider Culture*, dealt with that.)

Religious fundamentalists have not been the only ones to react to what we can call the extremist, narrow, and dogmatic vision of some scientists. The psychologist and philosopher William James, in an 1888 lecture critiqued what he saw as an indiscriminating cult of science that was itself becoming gullible, all the while imagining they were enlightened. He jabbed the narrow scientific materialism that was then on the rise, by saying: "Many persons seem to think

that any conclusion must be scientific if the arguments in favor of it are all derived from the twitching of frogs' legs –especially if the frogs are decapitated—and that, on the other hand, any doctrine chiefly vouched for by the feelings of human beings –with heads on their shoulders—must be benighted and superstitious.” The physicist Freeman Dyson of Princeton, who occupied the same position that Einstein held earlier, added the sentiment that “Arrogance is the besetting sin of scientists,” and many other scientists would agree with him.

All of my adult life, I have been a strong advocate for respecting the sciences. By estimate, I have given more than two hundred presentations on paleontology and related fieldwork, evolution, geologic time, fossils, and prehistoric life (mostly dinosaurs) to adults and to students ranging from kindergarten to college. (I mention this, because nothing brings out attacks on the idea of evolution like the subject of dinosaurs!) However, in answer to questions, I have also had numerous occasions to indicate that everyone, scientist or not, is, before all else, a human being and that, therefore, much more than science is needed in our intellectual, emotional, and social lives. If we don't make clear that science has limitations, we fall into *scientism*, which is really a kind of imperialist betrayal of science itself and of education in the widest sense. For, it is not only religion that has a stake in a broader definition of truth, but every other department in the university and every other book in the library that is *not* about science: every great literary work, piece of art, or film, or score of music, which we surmise to have value --because they are about Life. So, when Truth is the matter at hand, and with the poetic in mind, many of us would say that you cannot tell the whole truth without including the humanities.

Late in his life, Charles Darwin wrote his saddest words. “Now for many years, I cannot endure to read a line of poetry.... I have also almost lost my taste for pictures or music.... My mind seems to have become a kind of machine for grinding general laws out of large collection of facts.... The loss of those tastes is a loss of happiness.” He had a different sense earlier. In 1858, just before the *Origin* came off the presses the next year, he wrote in a letter to his wife Emma, saying: “I fell asleep in the grass and awoke with a chorus of birds singing around me, and squirrels running up the trees ...and I did not care one penny *how* the beasts or birds had been formed!”

Pascal, writing in the 1600s, noted: “Two extremes: to exclude reason, to admit reason only.” The “lower-case poet” e. e. cummings pointed to what happens when there is ignorance of that principle:

...beware of heartless them,
(given the scalpel, they dissect a kiss;
or sold the reason, they undream a dream.)

In one bit of verse, he writes of what he calls “the trivial labeling of punctual brains” and, in another, he says,

While you and I have lips and voices which
are for kissing and to sing with
who cares if some *one*-eyed son of a bitch
invents an instrument to measure Spring with?

Henry David Thoreau, likewise, was not impressed by certain aspects of the science he saw being practiced, with the mantra to endlessly take things apart and focus on the micro, the minutiae, the components, and measurements, while being oblivious to what he saw as the broader totality, the deeper and richer reality of the whole. So, he wrote in his journals, "I need not know the length of the eagle's entrails."

Recently, I read again his passage in one of his lesser-known works, *The Maine Woods*, wherein he tells of taking a break from his two-year stay at his cabin at Walden Pond to travel to Maine and hike to the top of the huge Mount Katahdin. As he climbed above the tree-line, he engaged the granite foundation of the world, exposed much as it is on the summit of the Beartooth Highway here in Montana, east of Yellowstone National Park. He said, "I most fully realized that this was primeval, untamed and forever untamable Nature. ...Some part of the beholder, even some vital part, seems to escape through the loose grating of his ribs as he ascends. ...I stand in awe of my body, this matter to which I am bound." Perhaps with his hands on the granite, he said, "Talk of mysteries! Think of our daily life in nature, --daily to be shown matter, daily to come into contact with it-- rocks, trees, wind on our cheeks! the *solid* earth! the *actual* world! ...*Contact! Contact! Who are we? Where are we?*"

Those who are more scientifically sophisticated might think: "Well, Mr. Thoreau need not have become all emotional; and he surely would not have done so, had he possessed our truly modern scientific understanding of matter. For, now, despite appearances, we know that the granite is not all that solid. Visualize this: If the nucleus of an atom were the size of a cherry, the outer electrons would be a mile away. Matter is really 'full' --not of matter-- but of emptiness. Atoms are cathedrals of cavernous space, and it is not the solidity of the rock itself that we feel, but the electromagnetic force fields set up by the atoms in the rock repelling the similar force fields in our hands. And beneath that again, it is all 'quirks and quarks,' and those on a still more fantastic scale of next to nothingness." --All true enough, according to facts and theory. But does this really help us to know the mountain and our own existence in relationship to the entirety of the natural world? Or is there not an additional, inexpressible something that escapes the implements and conceptions of science, as the "something" escaped the loose grating of Thoreau's ribs on the ascent? Perhaps any faculty of apprehension is a net too small and limited to even begin to capture the all-pervasive essence of things? Or perhaps the fullness of nature is not to be "captured" at all but experienced. At least, so thought Thoreau, who wrote that "A person has not seen a thing who has not felt it."

There are many ways to speak and think about our place in the universe, these in addition to precise and proper scientific terms and procedures. I love the language used by Annie Dillard in *Teaching a Stone to Talk*: "Like boys on dolphins, the continents ride their crustal plates. New lands shoulder up from the waves, and old lands buckle under. ...The planet spins, rapt inside its intricate mists. The galaxy is a flung thing, loose in the night, and our solar system is one of many dotted campfires ringed with tossed rocks. What shall we sing?"

The physical sciences have, by and large, banished magic: the magic of witchcraft's curses and spells, the toad in the stomach, and such. When the compass was invented and first put into use, ships' captains usually had to hide it and to consult the instrument in secret, lest there be mutinies by the sailors who would imagine their leaders to be guilty of "trafficking in the black arts." Science has largely overcome superstition, at least in most parts of the world. It has been able to supersede magic, yes. But a proper Mystery? No.

Science has mysteries of its own. How does a young Swainson's hawk know to fly 6,000 miles to the Argentina grasslands for the winter, a place to which it has never been? How is the adult pair that last year built its nest across the street from our house able to come back to that very same tree, after spending six months in South America? It is believed that many birds migrate to the tune of the earth's magnetic field, but when and how do they learn to do that? How does a young bird, such as a Baltimore Oriole, build a nest for the very first time? The structure is extremely complicated. It is said that "they just do it, automatically." Many such phenomena are written off by saying that "it is simply by instinct." But such a statement is quite far from being an *explanation*. It is a *description* --a muddy one, at that-- given, perhaps, to mask our ignorance and to obscure the fact that we *cannot* explain it.

Much of what science discovers are truly *wonders*. That is the sense of the statement carved in the physics building at UCLA, words of the great experimenter, Michael Faraday, that "Nothing is too wonderful to be true." The astronomer George Abell and the psychologist Barry Singer, in *Science and the Paranormal*, after referencing the Ice Age cave in Spain that is filled with magnificent drawings on the walls, wrote, "We treasure the cave at Altamira where a century ago a little girl first saw the great painted bison. New caves will be found, year after year, in lab or clinic or sky or ocean depth, or even in ancient markings. That is the promise of real science, which cannot allow wish to rule mind, but nonetheless finds unendingly wonderful things."

It was only in the last century that we began to get an idea of what lies beyond our own Milky Way Galaxy. In the 1920s, Edwin Hubble was working at the Mount Wilson Observatory in California with the largest telescope in the world. There, he discovered that the images of remote objects, such as that of the giant spiral nebula M31 in the constellation Andromeda, represent objects outside of our Milky Way and that they are, instead, other galaxies, many of them just as large as our own. On a clear and dark night, if you know right where to look, you can actually see the Andromeda Galaxy as a faintly glowing patch in the sky. At two and a quarter million light years away, it is the farthest object anyone has ever seen with the naked eye. Hubble also determined that galaxies are rushing away from each other, outward, as from a primordial explosion, and that the farthest ones are moving the fastest. Thus, the universe is expanding. (Individual objects, like the earth and our solar system remain the same size; it's the distance between the largest forms that is increasing. Physicist Richard Price at the University of Texas at Brownsville remarked, "Your waistline may be spreading, but you can't blame that on the expansion of the universe.")

The sun shines with photons from the thermonuclear fusion reaction at its core, flooding space with heat and light, and also emitting tiny particles of matter called neutrinos that travel, also, at the speed of light. They are so infinitesimally small that they pass right through the earth

without slowing down. In just a few seconds, ten million trillion neutrinos will have sped right through my body --and yours-- and, in another few seconds, they are much farther away than the moon. I have not verified this, and neither have you; we accept “on faith” what the physicists say, but isn’t it wonder-full?

Then, there is the fact that the matter in so-called neutron stars is so dense that a cubic inch of one would weigh more than dozens of air-craft carriers. How much we have yet to learn is also shown by the fact that there are measurements indicating that more than 80% of the universe is composed of so-called “dark” matter or dark energy: something totally unseen and totally “other” than the stars and nebulae and galaxies we observe, its presence known only by its gravitational effects. And no one, absolutely no one, has even the slightest idea what it is.

And, of course, think of the ultimate Beginning, the Genesis of cosmos creation, now often called by the trivial name, the Big Bang (which does no justice to it, and, without atmosphere, there would have been no sound; so, perhaps, it should be called The Great Light, instead). Consider again the different states of matter: the idea is that everything that would become a hundred billion galaxies --absolutely Everything that existed before the primordial explosion-- once occupied a space the size of a sphere able to pass through the eye of a needle (something the proverbial rich man of the Gospels could not do). And, if that is not amazing enough, where did *that* come from?

In such ideas, the imagination of science reaches its limits, so it curious that a person of centuries ago, the nun Julian of Norwich, spoke of what seems to be the same astonishing sort of thing. She wrote that, on the 13th of May in the year 1372, she had what she called an episode of enlightenment: “*He* showed me a little thing, the quantity of a hazel-nut, in the palm of my hand; and it was round as a ball. I looked thereupon with the eye of my understanding, and thought: What may this be? And it was answered thus: *It is all that is made.*”

Again, no matter how many so-called “explanations” that will ever be discovered about the universe, those are, instead, descriptions of how matter and energy perform. That is to say, those address only the *How*, and not *Why* it all works and why they exist, in the first place. They do not address the ultimate origin of anything and everything, including the basic physical laws of nature by which it all operates and unfolds. This means that, at bottom, is Mystery.

Thus, science is impressive. However, It’s simply not sufficient for the totality of our experience as human beings. In addition, and seen from another angle, science is not only insufficient; but, as practiced by some today, is the source of certain huge difficulties.

Samuel Beckett said long ago, “We are between a death and a difficult birth.” Perhaps all cultures are, all the time. But I think there is more to it, and it is related to the scientific method itself: what Francis Bacon termed the *Novem Organum*, the “New Instrument. For, we live in what is immodestly called The Scientific Age, the age for which Frances Bacon longed, and Descartes, too. Because of the degree of control afforded over nature, science has become the dominate paradigm. What we term both the *undeveloped* and the *underdeveloped* nations

are scrambling to follow the lead of the western world that says science is the key to the good life. Thus, we are living in the most rapid and most consequential cultural transition in the history of the human race. There are innumerable positive effects of science: modern medicine, with vaccines and sanitation, agriculture, engineering, transportation, communications, electronics, and so much more, as we well know. Yet, not all is light and progress, and it concerns something beyond those benefits, something prior and more fundamental.

At the heart of the scientific paradigm that has brought all this about is the assumption that nature can be treated --and is *best* treated-- as *an assemblage of objects*.

There are countless situations when treating something as an object *is* entirely appropriate. For instance, if I have a broken leg, the treatment is much of the same order as repairing the leg of a wooden table. Manipulation, adhesives, screws, and staples might be involved in both, and, my orthopedic surgeon should not be singing arias from the great operas, nor composing poetry, while dealing with my bones, even if I am unconscious and can't hear him. In this case, fully attending to my leg as an object is what works best.

(A humorous anecdote concerns the great director of mystery films, Alfred Hitchcock. He became very agitated about a quote that had been attributed to him; supposedly, he had said that "actors are cattle." He vehemently denied it, maintaining that his actual statement was that "Actors should be *treated* as cattle." This seemed like a big difference to him, but not to the actors.)

The technology-driven mode of thinking leans toward treating more and more entities as objects, even when and where it is inappropriate. Objects can be taken apart, analyzed, and controlled for human ends and, in this routine, the method itself is seldom questioned. However, nearby, is the all-too pervasive dualistic view that humanity is utterly separate from and superior to the rest of nature. It is the idea that we are *subjects*, and all the rest are *objects*. Thus, human beings are assumed to be in one realm, all else in another object-ified realm. This is not an inevitable effect or outcome of the scientific method, but it is one that is all too common.

Thus, our ways of speaking include "man and nature, man in nature, man of nature, man from nature." The conjunction does not matter: What is clear is the prevalence of the idea of dualism. Us & the rest of it. And this slides quite "naturally" into the idea that man is "over" nature: that all, everything, the totality, exists *for* us and *for* our control. Nature, in this paradigm, has become a collection of "its." So, nature is "natural resources," just so much raw material, inanimate and recalcitrant stuff to be pounded into shape and used and used up. And so, the bulldozers move without ceasing, and the fires burn endlessly in the Amazon, and anything remotely like Nature, before our coming, is in fast retreat ...to nowhere. And it all rolls on with scarcely a question raised. When there is the smallest protest, there are pre-emptive strikes in the form of the derisive bumper-stickers on the pickups in our towns that say, "Earth First --We'll log the other planets later." "Smoke a Pack a Day" --smoke, meaning kill, and the pack being wolves. To this mentality, other creatures have, apparently, no value at all. The tone communicated is that the driver is blatantly proud of the symbol of the crosshairs

and his assertion that, “If it’s brown, it’s down!” This is much more than the idea that the nation can use sustainable forests, etc. It is the idea that Nature is only fodder for human consumption and entertainment, an aggregate of objects.

Thus, for some, the scientific outlook has moved far beyond simply an investigative *method* to becoming, instead, a predisposed mindset, a *paradigm of domination*. Today, when most people look around them at “nature” –mountains, valleys, forests, prairies, lakes, rivers, and oceans-- what is it that they see? Well, they don’t see mysteries. As the writer Flannery O’Conner stated, “Mystery is a great embarrassment to the modern mind.” There are all too many who, in the words of Kathleen Raine, “see in the pearl nothing but a disease of the oyster.” They don’t see transcendence and epiphanies after the fashion of William Blake, who wrote:

To see a world in a grain of sand,
And a heaven in a wild flower,
Hold infinity in the palm of your hand
And eternity in the hour.

The modern mind often sees, instead, cash values, board-feet, and acreage, investments, potential contributions to the DNP, heaps of money in forms that only exist to be taken in hand and made over into something “valuable” that can be merchandised and, because it can be done, it *must* be done.

One of the essays by the Trappist monk Thomas Merton is *Rain and the Rhinoceros*. After describing the sounds of a life-sustaining shower in the night, deep in the Indonesian jungle, he says: “The time will come when they will sell you even your rain. By ‘they’ I mean the people who cannot appreciate its gratuity [giftedness], who think that what has no price has no value, that what cannot be sold is not real. ...The time will come when they will sell you even the rain.”

I sometimes think we are just about there. Surely, this is not the way it was *meant* to be. Of course, many in science have distain for that word “meant,” since it implies some sort of intent, some sort of purpose or intrinsic “rightness.” But is there *not* such a thing? Some are dismissive of nature’s intent, partly, at least, because they might be subconsciously committed to the view I just described: that we human beings are everything, we are all that counts, and *we* decide.

Never mind, apparently, that such a conception is not working out very well. Never mind, that the industrialization of the planet means that there is not an uncontaminated breath of air anywhere on earth. The same is true of water. The neurotoxin mercury is found, not only in the fish of Lake Erie, but in those of Lake Chelan in the Cascade Range, one of the most remote places in the lower 48 states, and in the lakes and rivers of the High Arctic. New studies show that a typical person may ingest about a credit card’s-worth of microplastics every week, perhaps more than a half- pound every year. Science has contributed to a population curve that will, shortly, outstrip our ability to support it with the dwindling of earth’s resources. And there’s climate change. Science has not eliminated war but immensely heightened the scale of its devastation, and most government funding for research and development goes for weapons of mass destruction. The “balance of terror” between the world’s great powers has come to be seen as normal, resembling more than a little that brilliant Peter Sellers movie, *Dr. Strangelove*.

Not for nothing did England's Lord Dunsany say, "Humanity is like people packed in an automobile which is travelling downhill on a dark night without lights at terrific speed and driven by a four-year-old child. The signposts along the way are all marked 'Progress.'"

Thus, the so-called triumph of the scientific method, "the New Instrument," begins to appear as anything but an unqualified success. If we're so intelligent, *homo sapiens sapiens* –not just once but *doubly wise*--- then, why aren't we taking better care of the earth and, in the process, taking better care of ourselves? Why the self-destructive behavior? For, part of nature as we most certainly are, that's what such behavior is. For all our so-called smarts, this begins to sound like ignorance in the extreme.

I can attest to the value of reading the monumental eleven-volume series, *The Story of Civilization*, by the renowned historian Will Durant. After volume X, in 1968, he wrote a slim book titled, *The Lessons of History*. One chapter is titled "Is Progress Real?" in which he says:

One of the discouraging discoveries of our disillusioning century is that science is neutral: it will kill for us as readily as it will heal, and will destroy for us more readily than it can build. How inadequate now seems the proud motto of Francis Bacon, 'Knowledge is power'! Sometimes we feel that the Middle Ages and the Renaissance, which stressed mythology and art rather than science and power, may have been wiser than we, who repeatedly enlarge our instrumentalities without improving our purposes."

The tool of science may, itself, be neutral, but there's no denying that it is sometimes put to purposes that are conceived in ignorance and arrogance. The ultra-rationalist Descartes had followers who performed experiments on animals, all the while ignoring indications of their extreme pain and seeing those as merely mechanically-wired responses. Thomas Hobbes viewed the heart as a sort of spring and joints as wheels as pulleys: the body was a machine. Not long ago, it was arguably the most scientifically advanced nation in the world that waged WWII, this in order to enslave whole nations and to exterminate entire races. It was seeing people as objects that opened the doors of the Nazi death camps for mass executions and for experimentation on human beings. We would like to assume it ended there. But the stereotypes of the mad scientists, such as Doctors Frankenstein and Moreau, are not for nothing: in certain quarters, the tendency abides. (You might recall the opening scene of the comic horror movie *Young Frankenstein* with Gene Wilder that captures the mentality so well: "We're doing *Science* here!!!")

In 1972, the historian Theodore Roszak published *Where the Wasteland Ends: Politics and Transcendence in Postindustrial Society*, which I highly recommend for a dense read that soundly challenges numerous cherished assumptions. In it, he has appropriately scathing remarks about the wooden literalism of biblical fundamentalism, which he calls a "monstrosity." But those are followed, immediately, by this statement: "The irony is, of course, that the fundamentalist and the scientific skeptic share the same single-vision consciousness.... For what science can measure is only a portion of what man can know." Roszak writes:

"There are, of course, other kinds of knowledge, those born of sensuous, loving participation, ecstasy, transcendent aspiration. But that way lies art, joy, wisdom, salvation –not power.

Science promised *power* as the means to all else. The promise was believed and at last realized, and so swept all before it. But we are left with no tolerance for those other varieties of knowledge, and so with no knowledge that can delimit power. ...The image of the totally quantified man is one of the oldest obsessions of the scientific imagination. It is born of the fear of vital spontaneity and a hostility toward the mysteries of the human heart.”

Owen Gingerich was for more than three decades professor of Astronomy and of the History of Science at Harvard. He was also the Director of the Smithsonian Astrophysical Observatory in Cambridge and the world’s foremost authority on Copernicus and Galileo. In one of his essays, he writes, “Carl Sagan has tried to persuade me that deep down we are nothing but machines, that the love he has for his wife can ultimately be understood merely as electrical and chemical impulses.” Gingerich didn’t buy what Sagan was selling. But many others have been selling, and buying, too.

Consider the statement of biologist Jaques Monod, “Living beings are chemical machines.” Apparently, they are cleverly synthesized “nothing but” that, therefore, invite all those strange fantasies of molecular engineering. And, apparently, it’s OK, because molecules are “*merely matter*.” Molecules cannot *feel*, they cannot *speak*.

Loren Eiseley wrote in his journal entry for June 7, 1953: “Got to thinking that Ernst Borek’s *Man the Chemical Machine* is a further extension of the Cartesian world view. First, man is a machine of pulleys and levers, then when this fails to provide the complete answer, he becomes the *chemical* machine; what, after this – the crystal-lattice-machine, the electron-machine? We must be near to reaching the end of this road.” But, of course, it keeps coming back in still newer forms, such as the person de-personalized into being the “mere robot vehicle controlled by selfish genes”-machine.

More than twenty years ago, an interesting experiment in perception was conducted by Professor Daniel J. Simons at the University of Illinois. It involved six people, three in white T-shirts and three in black, each just a few feet apart, weaving in and out, and quickly passing and bouncing a basketball back and forth, around and across a circle. An audience was asked to pay close attention and to count how many times persons with white shirts passed the ball. After just a little while, a man in a gorilla suit entered the circle, thumped his chest, and then walked off. The astonishing result: half the audience did *not* see the gorilla! The experiment has been run many times and, with subjects who had not heard of it, the results are almost always the same: half the watchers miss the gorilla! (“You can look it up.”)

The findings of the experiment are quite clear: our attention, our perception, is selective. What we *see* often depends upon our presuppositions, i. e. what we *expect* to see, and that determines, too, what we *miss*. Richard Dawkins, before he had heard of the experiment, also sat in on one, and the hard-nosed empiricist, he who has said, dogmatically, that God almost surely does not exist, because there is no proof, no visible scientific evidence –yes, that Dawkins-- did *not* see the gorilla! He writes in one of his books, *The Greatest Show on Earth: The Evidence for Evolution*, “I myself was flabbergasted when I failed to see the Simons gorilla, and frankly incredulous that it had really been there. Sadder and wiser after my second viewing

of the film, I shall never again be tempted to give eye-witnesses testimony an automatic preference over indirect scientific inference. The gorilla film, or something like it, should perhaps be shown to all juries before they retire to consider their verdicts. All judges, too." I would add that perhaps it should also be shown as part of discussions dealing with the presence or absence of God in the world to the eyes of faith, and to the eyes of unbelief, alike.

Roszak, again, has a lengthy appendix to *Where the Wasteland Ends* entitled, "The Reductionist Assault." It constitutes an explication of just a small amount of the research in biology that was then seen to be both on the cutting edge and highly esteemed, these culled from professional journals of the time. The fictional *Brave New World* of Aldous Huxley is nothing, compared to the following.

Concerning developing artificial intelligence, scientist Richard Landers looks forward to the day when our closest friends will not be real people: "When the day comes that conversation machines are developed, I strongly believe that many will prefer them to humans as telephone partners –particularly when the machines are 'tunable' to one's personality." "Therapy by Terror" was Roszak's name for one methodology, which I will not describe, but the "advanced interrogation techniques" of our recent history are related. Another study was by a Dr. Delgado who was delving into electrical stimulation of the brain, which he said "could become a master control of human behavior by man-made instruments." He foresaw a "psycho-civilization" adorned with "happier, less destructive, and better balanced" populations.

Francis Crick, co-discoverer of the structure of DNA, for which he shared the Nobel Prize, has said that "The modern movement in biology is to explain all biology in terms of physics and chemistry." This movement also suggests, to him, the possibility of human split-brain surgery and experimentation. Crick writes, "If, for long periods of time, one could prevent the two brains from communicating with one another, one could perhaps convince one brain that it was in the same body as another brain –in other words, one could make two people where there was only one before." This might be "disturbing," Professor Crick admits, but it is "an area of research that is likely to lead to interesting consequences." (This from the article, "Of Molecules and Men," University of Washington Press, 1966, pp. 87-89.) Another white coat suggests that this would demonstrate that "free will is purely an illusion." Dr. R. J. White of Cleveland Metropolitan Hospital pioneered a technique of preserving the living brains of monkeys. Why? He says, "The procedure is potentially applicable to human beings." A Professor David Hume of the Medical College of Virginia wants to "go one better" and proposes the preservation of the whole disembodied head. (As in the movie *Mars Attacks!* ??) I'll spare you the details of that, too. Then there's cloning "to achieve a kind of immortality." And most people don't want to know of horrific experiments on animals that are done; we have *willful* ignorance based on the perverse assumption that if an animal cannot *speak*, then it cannot *feel*, or that its feelings may be ignored. Eiseley, was likely thinking of all such things when, in an essay titled, "*Science and the Sense of the Holy*," he wrote, "One can only assert that in science, as in religion, when one has destroyed human wonder and compassion, one has killed man, even if the man in question continues to go about his laboratory tasks."

Thus, the very method of science so easily lends itself to objectification of the Other. (Note that in a scientific paper, one never says “I saw this or that happen,” only “It was observed.”) Other beings easily become “only, just, merely, simply” or “nothing but” this-or-that physical-chemical process. Those are phrases that occur time and again in scientific literature. By them, one can easily be drawn into the dualistic mode, the mode that analyzes but does not empathize, for the latter would not be “objective,” i. e. *object-ive*. But what if the subject and the living object, both, are not only, just, merely, simply, objects? –a truth that we know deep in our bones and from the *inside-out*.

Eric Fromm (1900-1980) was a German Jew who fled the Nazi regime to make his home in America. He was a practicing psychiatrist and teacher who expressed his central concerns in his widely read 1956 book, *The Art of Loving*. With it, he sought to counter what he saw as a rising materialism and the consequent objectification of human beings:

“In the sphere of material things, giving means being rich. Not he who *has* much is rich but he who *gives* much ...of his joy, of his interest, of his understanding, of his knowledge, of his humor, of his sadness –of all expressions and manifestations of that which is alive in him. ...But in giving, ... the teacher is taught by his students, the actor is stimulated by his audience, the psychoanalyst is cured by his patient –provided they do not treat each other as objects, but are related to each other genuinely and productively.”

What if sympathy, empathy, entering into another’s suffering is, indeed, of the very essence of our humanity? The hawk does not empathize with the gopher in its talons, because it *cannot*. With us, it is, or should be, different. A great discovery, Shanindar Cave in Iraq, is the burial site of four Neanderthal skeletons. One of them had received such a blow to the head that he was almost certainly blind. Most of one arm had been amputated, and other injuries that meant that he must have barely been able to walk. Yet, he lived on, this in a harsh environment, to an approximate age of 40 or 50, at the time, a very long lifespan. And he did it, only because he must have had others who *cared* for him. Across 50,000 years, it is such caring that is the hallmark of what it means to be human. Not intelligence, only, but compassion.

Science and its child, technology, serves us so very well in several arenas, but many of us are now sensing that we need to give more attention to the wise use of that instrument, not just to the means, but to long-term ends. For, too often, the unspoken but eager assumption is that if something *can* be done, then it *should* be done, and the pendulum swings too far in the direction of a thoughtless reductionism. Thus, in addition to knowledge, what is needed is Wisdom, something that science, by itself, simply as method, is helpless to provide. Thus, how good it would be to see the human race fall more nearly in love again with the humanities, this not merely as a counter-balance to science, but because those subjects alone are equipped to get us into the deeper dimension of what a person’s life, in all of its joy, suffering, ambiguity, and fullness is about. Seeing reality too nearly as a collection of lifeless *objects* is an unimaginative, small-minded and irreverent diminishing of the grandeur of all Creation, including our own part in it. For it is not molecules that learn, it is the totality of a living creature. It is not DNA that wonders, it is the wondering person. It is not the physical organs

that remember and love and hope and imagine and work for justice and separate right from wrong. It is the complex unity of a human being who is, truly, much more than the aggregate sum of chemical parts.

This reassessment would also include stepping back to transform how we see our relationship to all the rest of Nature. It would mean seeing the world itself more nearly as sacramental, holy, blessed. It was Henry Beston who wrote in *The Outmost House*, "Whatever attitude to human existence you fashion for yourself, know that it is valid only if it be the shadow of an attitude to Nature. ...The ancient values of dignity, beauty, and poetry which sustain it are of Nature's inspiration; they are born of the mystery and beauty of the world." A heartfelt appraisal would mean a reaffirmation of what our ancestors, before the dominance of science, took for granted: that we are not separate from Nature. It would realize that a truly foundational reality is our "connectedness" with everything else. It would mean choosing kinship over kingship. Emerson said, "I feel the centipede in me –caiman, carp, eagle and fox. I am moved by strange sympathies." In the same vein, the Welsh poet Dylan Thomas wrote:

The force that through the green fuse drives the flower
Drives my green age.
...The force that drives the water through the rocks
Drives my red blood.

Scholars who are at home with the language in which the book of Genesis was written indicate that the names in chapter 1 are highly symbolic and have profound meanings. The Canadian geneticist David Suzuki is aware of that, also, for he writes in *The Sacred Balance: Rediscovering Our Place in Nature*: "The first man of the Bible is named Adam, from the Hebrew *adama*, meaning 'earth' or 'soil.' The first woman, created from Adam's rib, is Eve, from '*hava*,' meaning 'living.' Together they make the eternal connections: life comes from the soil; the soil is alive."

The second creation story in Genesis, in chapter 2, says, "Then the Lord God formed man of dust of the ground and breathed into his nostrils the breath of life; and man became a living being." And so, at Christian funerals we hear the reminder in chapter 3, that "from the ground you were taken; you are dust, and to dust shall you return." Some of us have spoken the following words hundreds of times: "In sure and certain hope of the resurrection to eternal life through our Lord Jesus Christ, we commend to almighty God our brother/sister, and we commit his/her body to the ground, earth to earth, ashes to ashes, dust to dust."

At bottom, this earthy, sacred, and mysterious connectedness also underlies the truth taught by ecology, evolutionary biology, and even astronomy: that each and every single thing is *not* a single thing, but has originated in and is related to *everything* else, even stretching back for eons. It's the story of the constant combination, recombination, and the recycling of the basic constituents of the Tree of Life, all of which were forged in multiple generations of exploding stars in the vast Milky Way and over the course of billions of years. John Livingstone, biologist, ornithologist, in his book, *One Cosmic Instant*, writes, "Though I do not expect that I shall be reborn directly as a crocus, I know that one day my atoms will inhabit a bacterium here, a

diatom there, a nematode or flagellate –even a crayfish or a sea cucumber. I will be here, in myriad forms, as long as there are forms of life on Earth. I have always *been* here, and with a certain effort of the will, “*I can almost remember.*”

The crust of the earth contains all the elements of the Periodic Table; they constitute building blocks of absolutely everything known to exist on the planet. Thus, the major components of our bodies can be found in any high school chemistry lab, just a few cents worth, often swept up from the floor. In a basic sense, it is all “simply matter: common, ordinary stuff.” ...And yet?

Loren Eiseley was an anthropologist who taught at University of Pennsylvania. The primary focus of his research was the peoples of the Ice Age, but he had also studied creatures of much more ancient times. In 1957, he published *The Immense Journey*, a book of essays that that struck such a responsive chord in the hearts and minds of so many readers. In the essay, “The Judgment of the Birds,” he tells of once standing at dusk in a section of remote and desolate badlands, likely in western South Dakota, where erosion had exposed the disarticulated and fossilized bones of creatures who had lived there in the dim past, some forty million years ago. His thoughts ran to the huge shearing molars of the great rhinoceros-like titanotheres, the slender stabbing canines of the lithe saber-toothed cats. He touched the femurs and vertebrae of giant pigs, small camels, and three-toed horses. The chemical constituents of that vanished world still colored the rocks and stained the naked earth all about him: “The iron did not remember the blood it had once moved within, and the phosphorus had forgot the savage brain.” Eiseley scanned a far horizon:

“It was then that I saw the flight coming on. ...Across the desert of eroding clay and wind-worn stone they came with a faint wild twittering that filled all the air about me.... I had lifted up a fistful of that ground. I held it while that wild flight of south-bound warblers hurtled over me into the oncoming dark. There went phosphorus, there went iron, there went carbon, there beat the calcium in those hurrying wings. ...It cried its individual ecstasies into the air until the gullies rang. It swerved like a single body, it knew itself and, lonely, it bunched close in the racing darkness, its individual entities feeling about them the rising night. And so, crying to each other their identity, they passed away out of my view.

“I dropped my fistful of earth. I heard it roll inanimate back into the gully at the base of the hill: iron, carbon, the chemicals of life. Like men from those wild tribes who had haunted these hills before me seeking visions, I made my sign to the great darkness. It was not a mocking sign, and I was not mocked. As I walked into my camp late that night, one man, rousing from his blankets beside the fire, asked sleepily, ‘What did you see?’

“‘I think, a miracle,’ I said softly, but I said it to myself. Behind me that vast waste began to glow under the rising moon.”



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