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# Cultural Values Versus Science

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To understand the present conflict between our relatively sedentary cultural values and the ever-changing views of science, we must consider the role of those rationalistic thinkers who gave frame and body to a reductionist mechanical world view over a period of some 300 years.

Rationalist thinkers, such as Francis Bacon (1561-1626, English philosopher and essayist), Galileo Galilee (1564-1642, Italian scientist and philosopher), René Descartes (1596-1650, French philosopher and mathematician), John Locke (1632-1704, English philosopher), Isaac Newton (1642-1727, English mathematician, scientist, and philosopher), and Adam Smith (1723-1790, Scottish political economist and philosopher), legitimized and institutionalized the lust for material wealth over which feudal society had for so long fought. In so doing was born the reductionistic mechanical world view.

Consider the collective paradigm of these renowned men: Nature's sole value is in service to the material desires of humanity (Bacon, Locke). But Nature must be tortured before Her secrets will be revealed for human use (Bacon). Once wrested from Nature, only those secrets that are measurable and quantifiable are real or relevant and can be studied (Galilee). Because real things are both measurable and quantifiable, they must operate through predictable linear mechanical principles, like an enormous machine (Newton). And like a machine, real things can be understood by disassembling the things themselves into smaller and smaller, more manageable pieces, which can then be rearranged in an order deemed logical to the human mind (Descartes).

With reductionistic mechanical logic, major segments of Western society confer upon themselves the unlimited rights of individual private property (Locke) for which people must compete with one another in pursuit of their own self-interests (Smith). Such self-interest is to be free from any government interference because the "Invisible Hand" of moral guidance will temper self-interest in the pursuit of material wealth - for the betterment of society (Smith). While Smith's "Invisible Hand" has spiritual connotations, they are out of keeping with his pursuit of self-interests in the form of material wealth. Further, his notion of a Higher Moral automatically guiding human action was already overshadowed by the accepted reductionistic mechanical posits of Bacon, Galileo, Descartes, Locke, and Newton.

The current analytical perspective thus involves a four-part process: (1) disarticulate the system into its component parts, the smaller the better, (2) study each part in the sterility of isolation, (3) glean a knowledge of the whole by studying the parts, and (4) rearrange the parts in a way that logically fits our

reductionistic mechanical world view. This is like disarticulating a live cat, rearranging its parts, putting them back together again, and expecting the cat to live and function as before.

Two implicit assumptions are based on this analytical perspective: (1) systems exist as aggregates of interchangeable parts functioning in a predictable linear fashion, and (2) by optimizing a given part or parts to a desired human end, the entire system is optimized for human benefit. We thus continually fragment our problems into smaller, more manageable (albeit linear and increasingly dysfunctional) pieces while our challenges become evermore systemic.

Our behavior, the extension of our feelings, thoughts, and values is destroying our biosphere because we insist on applying the reductionistic mechanical model as it was falsely legitimized many decades ago. But it is increasingly apparent that the root of our social/environmental crisis is a crisis of spiritual/moral values brought about by clinging to a self-centered world view and its associated value system.

Under the influence of the reductionistic mechanical world view, it is too easy to dismiss as impractical idealism any attempt to refocus from immediate bread-and-butter issues to long-term processes and futuristic ideas. Further compounding the belief that long-term processes and futuristic ideas are merely impractical idealism is the notion of "conversion potential." For many people, the only value of anything is its "conversion potential," which dignifies with a name the concept that Nature, having no intrinsic value, must be converted into money before any value can be assigned to it. All Nature is thus seen only in terms of its conversion potential.

Western civilization was lulled to sleep by the thinking of Descartes and Newton, but we are awakening to the flawed nature of their premises. The new vision of a single organic whole is being derived through the revolution in physics, primarily quantum mechanics and the work of Albert Einstein et al. But conservative thinking has yet to catch up with the knowledge of modern physics and a changing world view.

No matter what central issue is discussed, therefore, the dynamics are the same - an underlying crisis of perception. Our continued acceptance of this world view as the absolute truth and the only valid way to knowledge has led to the current global crisis and propels us ever closer to social collapse through environmental destruction.

Now, as history's veil enshrouds the events of the twentieth century, the cherished cultural values of the reductionistic mechanical world view are in deadly grapple with the revelations of science that increasingly challenge that view. One of the major problems facing us today is the way in which we accept that challenge, be it from a product frame of reference (however the "product" is defined) or that of a systems approach, and all the shades in between. The

differing perspectives define the terms of debate.

In my experience as a facilitator helping to resolve environmental conflicts, the more product oriented a person is the more resistant he or she is to change. seeing it as a condition to be avoided because he or she feels a greater sense of security in the known elements of the *status quo* especially where money and private property are concerned. But, as Helen Keller once said: "Security is mostly a superstition. It does not exist in Nature. Life is either a daring adventure or nothing." Conversely, the more of a systems thinker a person is the more likely he or she is to agree with Helen Keller and risk change on the strength of its unseen possibilities.

A product-oriented person is likely to be a rural resident very much concerned with land ownership and property rights, wanting free rein to do as he or she pleases on his or her property, at times without regard for the consequences for future generations. The more product- oriented a person is the greater is the tend to place primacy on humans of one's own race, creed, and religion, as well as on one's own personal needs, however they are perceived. The more product-oriented a person is the greater the tendency to disregard the land's sustainable capacity. Also, the greater the product orientation the more black-and-white one's thinking tends to be, which may have led American psychologist William James to observe that "a great many people think they are thinking when they are merely rearranging their prejudices."

A systems thinker, on the other hand, is most often an urban dweller, who is likely to be concerned about the welfare of others, including those of the future and their nonhuman counterparts. Systems thinkers also tend to be concerned with the health and welfare of planet Earth in the present for the future. And systems thinkers more readily accept shades of gray in their thinking than do product oriented people.

Product-oriented people tend to focus on individual pieces of a system, its perceived products, in isolation of the system itself, whereas systems thinkers tend more toward a process approach to thinking. A person oriented to seeing only the economically desirable pieces of a system seldom accepts that removing a perceived desirable or undesirable piece can or will negatively affect the system's productive capacity as whole. Their response typically is: "Show me; Prove it; I'll believe it when I see it." Resolution to environmental conflicts to such a person is usually seen as an immediate problem-solving exercise.

In contrast, a systems thinker sees the whole in each piece and is therefore concerned about tinkering willy nilly with the pieces because he or she knows such tinkering might inadvertently upset the desirable function of the system as a whole. A systems thinker is also likely to see himself or herself as an inseparable part of the system, whereas a product-oriented thinker normally has himself or herself set apart from and above the system. And a system thinker is willing to focus on transcending the issue in whatever way is necessary to

frame a vision that protects the system for the good of both the present and the future.

Unfortunately, when asking questions of value, we usually juxtapose product and systemic points of view, and then try to answer them with science. But science, which theoretically is the free pursuit of knowledge for its own sake, is the language of the intellect and was never designed to deal with values, which are the language of the heart. Both languages, however, are today necessary if human culture and its manifold environments are to be mutually sustainable.

The great irony is that science, like values, is subjective. Nevertheless, the goal of scientific endeavor must remain the pursuit of pure knowledge, which demands unencumbered and open-ended inquiry while striving to be as objective as possible.

To keep the search for truth on its own credible track, one must first recognize the human tendency not only to form a single hypothesis but also to become so attached to it that any criticism of or challenge to one's methods raises one's ego defenses. This reflects the attachment to one's intellectual child, which is born the moment one derives what seems to be an original and satisfactory explanation for a phenomenon. And the more the explanation becomes a definite theory, the more attached to it one becomes. Then comes the massaging (as I've often heard it called in government agencies) of the theory to fit the data and of the data to fit the theory.

In addition, we tend to be "method-oriented" rather than "problem-oriented" in our thinking and therefore in many of the questions we ask. It's important to recognize this because we tend to think that through our experiments - our methods - we are learning the Truth about Nature when in fact we are learning only about our experimental designs - again, our methods - and our assumptions and expectations.

It is impossible to accurately "represent" Nature through science, because scientific knowledge is not only a socially-negotiated, rigid construct but also a product of the personal lens through which a scientist peers. Scientists may attempt to detach themselves from Nature and be "objective," but they are never completely successful. They are part of Nature and must participate with Nature in order to study Nature.

As well, every scientist sees through his or her lens but dimly, first because we cannot detach ourselves from Nature and second because all we can judge as fact are our own perceptions, which are always colored by the lenses of our own value systems. Appearance, therefore, not reality, is all we can ever hope to see, and so it is appearance to which we often unknowingly direct our questions.

The secret about scientific research is that nothing can be proven - only disproven; nothing can be known - only unknown. So we can never "know" any-

thing in terms of knowledge only in terms of intuition, which is the knowing beyond knowledge that is inadmissible as evidence in modern science. Whatever truth is, it can only be intuited and approached, never caught and pinned down.

Over time, science, as imperfect as it is, has performed a vital function. It has piqued our imagination, challenged old ways of thinking, explored unknown phenomena, excited our sense of wonder and awe, elucidated relationships, and demonstrated the fuzziness of our world view. Science has shown that the sharp, clear lines of the mechanistic myth were derived by reducing ecological variables to economic constances. It has shown that the world in which we live is an interactive, interconnected, interdependent system in which the whole is expressed by the *function* of its parts, not by the parts themselves. And science has show, albeit subtly, that there is no such thing as an independent variable, an interchangeable part, or a predictable outcome.

The salient point, therefore, is our illusion of definitive knowledge, not the state of our ignorance. And it is exactly because we are so certain of our knowledge that we are often so abysmally unaware of our ignorance.

Product-oriented thinking argues to retain of the old reductionistic mechanical world view as its premise for decision-making. Systems thinking argues for an evolving unified world view even though it is only now emerging into our consciousness. The conflict in decision-making, therefore, is between product-oriented and systems-oriented (process-oriented) values based on different world views, something science can address only indirectly.

The Endangered Species Act, for example, is first and foremost a question of values - do we or do we not as a moral act save our fellow species from extinction? Only secondarily is it a matter of science as we endeavor to save species in an attempt to understand their ecological functions and hence the environmental consequences of losing them, an understanding that may ultimately change social values.

In this sense, the Endangered Species Act is an ecological insurance policy for the future sustainability of human society within the context of a sustainable environment. But in its political enactment, it flows from long-term scientific inquiry back to immediate competing social values, to which the more product-oriented segment of humanity pays the most attention to the potential detriment of environmental sustainability - present and future.

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