

A Change of Paradigm: The Death of Reductionist Science; A Struggle Towards Integration

Rustum Roy*
The Pennsylvania State University

Destroying the Old Cultures

The four robust facts which are driving the rapid but highly disorganized, amorphous human clambering towards a new paradigm are:

1. The metamorphosis of technology into a full-blown religion for a large fraction of humankind.
2. The completion (and hence, end) of reductionist science. And the beginning of the end of the sci-tech hegemony over culture first manifest in whole-person-medicine.
3. The empirical, grassroots, re-affirmation via experience of the human's need for the transcendent dimension (religion, spirituality, whatever) of existence.
4. The erasure of religio-socio cultural boundaries by the technologies of transportation and communication which drive globalization.

Together, these constitute a juggernaut. Get out of the way or find a special niche in which to hide.

The nature or even the options for the "new paradigm" are totally unclear. We overestimate the power of the day-to-day experience over the inner belief structure or paradigm by which humans make sense of their universe. We underestimate the ability of humans to hold together in their daily lives totally contradictory views. It is an untested projection from our past history that humans require some self consistent, over-arching, articulated paradigm to live by. In the Maslovian hierarchy of needs "meaning" is far up the scale from the workaday world of "survival."

The Nature of Any New Paradigm

It is my personal belief and affirmation that the "articulated worldview" or "religion" (which is not only a passive view or understanding, but includes an active behavioral commitment) is essential for the most fulfilling, creative human living. But I also know, that millions manage without any such worldview and live as run-of-the-mill citizens. The ability of consigning to heaven, or hell having evaporated, the power to enforce, educate or encourage the average person to learn about, choose, give allegiance to, some new paradigm, is also drastically weakened. This leads me to my first major conclusion: The new paradigm or religion will be weakly adhered to. At best one can hope for a fuzzy aggregate of fuzzy concepts with a modest pull on our minds and hearts, and a passive conformance to the path of least resistance. There will be no bitter struggle over a Nicene Creed, no Armageddon over one letter (iota). No 39 Articles will be enacted and no one will issue "Nihil obstat." The curriculum for the new paradigm will be as broad as the catalogue of courses for Penn State's 75,000 students, or the myriad offerings of the New Age meccas such as Omega or Esalen.

The Displacing Forces

A pendulum keeps swinging so regularly because acting on the little "bob" at its end are "displacing" forces (like a push) and counterbalancing these are "restoring" forces (gravity). The most surprising

*Evan Pugh Professor of the Solid State, Professor of Science, Technology and Society

observation about the new swing of the pendulum towards the integration is how suddenly it has appeared, and how it has appeared in the midst of the reality of technological advances seen by billions and , experienced by a substantial fraction. Add to that the incessant, loud, propaganda, financed by public money, for the 'gee-whiz' images and (non-existent or concocted miracles of science (99.99% of the miracles of "science" that any ordinary citizen is aware of, are miracles of technology not science).

This fact alone tells us that the former Initial Public Offering (IPO) of a new paradigm, one based on reductionist science and happy-face technology has failed badly. "Man (sic) does not live by bread alone." Humans reject the thin gruel offered by science with its utterly silly concentration on more and more detailed, (and more and more 'dishonest' anthropomorphization of "clashing galaxies," which never existed as shown, do not now exist, and will never repeat). Cutely named pet rocks on Mars and the charade of unproven, and to most scientists, non-existent, unicellular biological entities, surreally called LIFE on Mars, has been ignored by the public, but had its intended effect on NASA's budget.

Reductionism Seen Through: Its Job is Complete

The reductionism of the scientific fundament underlying the "Enlightenment" project has sealed the end of a couple of centuries of the rise of secular humanism. Why? Because common sense and human experience – to say nothing of good science -- has led the majority to realize that a car is more than four tires, a gas tank, steering wheel, seats, etc. Why? Because at its most sophisticated level, and all the bombast about a theory of everything, the particle

physicists and their best theoreticians after 70 years cannot even tell us the properties of even the simplest compound – say H₂O. A theory of nothing important to nearly everyone would be an accurate title for this goal.

All great scientists are wholists. Einstein, after all was not tucked away in an ivory tower. He worked 9-5 (till 1909) as an Examiner Second Class in the Patent office in Zurich looking at innumerable drawings of real gadgets and machines from which he drew many inspirations while he did his most important work in theoretical physics. He urged his science audiences to put their work into a human context.

" It is not enough that you should understand about applied science in order that your work may increase man's blessings. Concern for man himself and his fate must always form the chief interest of all technical endeavors, concern for the great unsolved problems of the organization of labor and the distribution of goods -- in order that the creations of our mind shall be a blessing and not a curse to mankind. Never forget this in the midst of your diagrams and equations."

When have you heard that since from a scientist. Instead, since W.W.II, with the ascendancy of public funding of science, we entered the era not of the amateur -- doing science for the love of it, like Charles Darwin or Rachel Carson – but of the hired gun, and the paid priesthood. In literal fact, science became, after W.W.II, the Established Religion of modern society worldwide. In the USSR it was only more obvious. In the USA, Ralph Lapp already in the late forties, had designated the scientists as the "New Priesthood." President Eisenhower -- not a sophisticated philosopher – in his 1961 Presidential valedictory not only singled out the "military-

industrial" complex but the "science establishment" as a major potential danger to the country.

Strangely enough, however, the Achilles heel of Science, before its own peer groups, is not its failure but its success. The unchallengeable empirical fact is that a contemporary modern scientist-citizen has, at her beck and call, a theory of everything that matters to human beings and human society. Indeed "theory" in science has added precious little since quantum mechanics 70 years ago, and DNA merely 50 years ago. Of the applications, manipulations, and recombinations of this knowledge to yield new molecules, materials, devices, and gadgets there is, and will be, no end. But "basic science" has succeeded so well that it is out of a job. Literally. The undeniable fact is that 100% (i.e. every single one) of the world's major corporations between 1993 and 1995 simply got rid of all their "basic 'untargeted' science" because they faced up to the obvious truth that it could never provide any R.O.I. Yet industry, government and of course, the recipient universities now cheer on the public sector to continue this welfare for the usefulness-challenged group within science. This obfuscation of technologically illiterate public servants will last another 5-10 years. But, in the meantime, the intellectual battle is being joined. Written one year, the following four titles have appeared: "The End of Science," by John Horgan, an Editor at Scientific American; "The End of Illusion," by Dan Sareintz, a geophysicist at the USGS; "The End of the Future," by Jean Gimpel in Paris, and "Economic Laws of Scientific Research," by Terence Kealey, a biochemist at Cambridge. The overlapping themes in their books argue that it is (roughly) all over for really new basic scientific discoveries. What you have is what you get. It is the argument I advanced

much earlier in my Hibber lecture, given in London, entitled "Experimenting with Truth," in 1979. No coherent, book-length response has emerged. The typical response is disbelief or anger that such a thesis could be advanced. This is coupled invariably by reading further into reductionist absurdity. We will work on something even smaller and even less consequential (particle physics) and baptize that "basic," or even bigger or further (radio astronomy) and use false colored, infinitely prejudicially selected images to humanize the inconceivable (10^{12} light years each about 6 trillion miles).

My position, (as an extremely active physical scientist with a large group supported by a dozen different agencies and companies from across the world) is that we have won the "war." We know all the "basic science" needed for 99.99% of the world's scientists: physicists, chemists, electrical and chemical engineers, biologists of all stripes, etc., etc., to continue their research. No new discovery can displace the laws of motion, of E&M, of relativity, and quantum mechanics. The periodic table is locked in, as is the DNA structure. Of course, an infinite array of presentations will continue, our machines will have more and more resolution. I can routinely image atoms in my crystals with a \$50,000 gadget of which now thousands exist. The problem is to find anything useful to do with such. The End of the truly basic science – defined as that which can affect larger and larger areas of science (as quantum mechanics did) is fully assured.

Except. Except that I believe that by searching outside the area of reductionist science which has been so successful we may indeed find enormously challenging and influential new realities. For example, what happens when this well know set of physical

realities interacts with nonphysical realities of mind and spirit. I refer the reader to Rupert Sheldrake's "Seven Experiments that Could Change the World," for examples of really new ideas. Which brings us to the major battleground where the struggle for the soul of humans will be fought out in the next decade.

Whole-Person-Medicine:

The Nemesis for Reductionist Science

There are two absolute reasons why it is on this one area that the coming debate on the future of inner-directed reductionist science will turn.

The first, is that healing and medicine is desired by everyone, and is experienced by millions. Hence, citizens do not have to -- and no longer do -- rely on "the experts."

The second, is that modern reductionist high tech medicine has played wonderfully through its strength, point-to-point delivery of relief within the body. But, and this is the essence of the reductionist limitation, a person is a complex interacting system of body-mind-and spirit. Point-to-point body healing by high-tech routes is obviously neither necessary nor sufficient in millions of cases. Such whole persons spend 15-20 billion dollars taking their needs to an array of whole-person-healers like acupuncturists, chiropractors, massage therapists, yoga and ayurvedic, qi-gong masters. They, empirically, find as much, or more healing in these WPM techniques as they do in traditional medicine. Surveys show that "they, the WPM clientele" -- are higher income and better educated than the average citizen, and includes more than their share of scientists and doctors. The battle is joined: WPM with wide public appeal and support versus the religious fanaticism of reductionist medicine.

The wider verifications of this "Waterloo" -- are not hard to see. If this area of science can be successfully challenged by a wholist paradigm, what then of all the other reductionist science?

The accompanying articles expand on this theme.

© Rustom Roy

WHOLE-PERSON-MEDICINE: TOPPLING THE MOLOCH OF REDUCTIONISM

Rustum Roy*
The Pennsylvania State University

There is something big afoot and some self-anointed high priests of science (not medicine) don't like it; others welcome it. Imagine if you please Andrew Weil an advocate and practitioner of integrative medicine – advocating prevention, emphasizing largely vegetarian diets, herbal remedies, reformulated spiritual attitudes, etc. as keys to health – on the cover of *TIME*. And then Deepak Chopra – poking fun at reductionist medicine, challenging us all to deal with the elusive reality of consciousness – on the cover of *Newsweek*. And Larry Dossey that brilliant lecturer speaking at Hershey Medical Center on (you won't believe it) the scientific data on the efficacy of prayer in healing. And heresy upon heresy, Professor Herbert Benson at Harvard Medical School getting his research on the role of relaxation/response and, nowadays, even prayer, written up in a major story in *Science* magazine. And the Pittsburgh Press reporting in a full page story on Catholic nuns carrying on Jesus' ministry of healing touch by giving massages.

But even before this recent spate of obvious public recognition of these very different practitioners of whole-person-medicine certain fundamentalist believers in reductionist science had mounted an attack on it. The target they chose involved tiny amounts of money. A group of Senators and Congress persons, urged-on by their constituents, had started an Office of Alternative Medicine within The National Institutes of Health in 1992, funded at \$3 million per year. This year OAM's budget was roughly \$10 million out of the \$11 billion NIH gets. That is all the "alternatives" got: one tenth of one percent of the public research money spent on high-tech medicine. Yet an odd assortment of

"scientists" - none from medicine - chose to launch an attack against this minuscule expenditure on research, and development of alternative therapies on which American citizens spend \$14 billion of their own (not insurance) money. These ayatollah's of the academy announced that all this alternative stuff wasn't science. But no Pope has spoken thus, ex cathedra, with less effect. Surely they were not concerned about 0.1 percent of the budget of one agency. No, these science administrators have realized that much, much more is at stake.

So what is at stake? At stake is the claim that reductionist science is the only - at least supreme - way to truth. Whole-person-medicine practiced within every culture for millenia is an empirical science based on observations by hundred of millions of humans on what works for them in keeping healthy or getting over illness. The array of different techniques used is mind-boggling. The closest to "high-tech" or allopathic medicine is the use of natural plant-products as medicines. Grandmothers were right about garlic and turmeric even while it was ridiculed by high-tech medicine. Much of preventative medicine from hand washing to the profound role of diet we owe to people like Pennsylvania's own "alternatives" champions: The Rodale family which has published *Prevention* magazine for 50 years, reaching tens of millions monthly with the whole-person message. Norman Cousins – with no college degree -- founding Editor of *The Saturday Review* who healed himself by laughter therapy and Vitamin C, opened up what is now given a fancy title: psycho-neuro-immunology. Put simply; Yes, your mental condition can cause physical change in

*Evan Pugh Professor of the Solid State, Professor of Science, Technology and Society

your bodily functions. Another long known truth has now been confirmed by 'science.' Acupuncture literally ridiculed by Western medicine for a century, which also treats the whole-person, and uses the vehicle of needles, is now okay. Chiropractors and osteopaths millions claim, do more for their aching bones than high-tech medics. In India, precise massaging has been taken to highly scientific lengths for healing. In China, the control and management of "chi," the spirit, is at the basis of staying healthy and curing dis-ease.

What is going on here is utterly profound. Especially in the last hundred years the success of this kind of benign, non-invasive technology, which ordinary citizens experience has been overwhelming. In the nineteenth century all the so-called alternatives were part of normal American medicine. But, before 1900, the vast majority of the world's U.S. citizens had not experienced all the goodies technology gave them: trains, cars, electric lights, telephones, radios, planes, TV, computers. The fact proved to them is that such technology works. It delivers to humans what they need, and much that they do not need at all. And, of course, it worked -- in part -- also for relieving pain. This year is aspirin's 100th Birthday, and it is just over 50 years since Penicillin appeared. And hundreds of millions attest to their efficacy. But yet, planted alongside these real goodies of technology, was an insidious claim -- that these were the gifts of Science, a new kingdom, which must start not from the tangible infinitely complex, Nature, including its embedded transcendence, but from abstractions which we in the science community know well: electrons, protons, atoms and even just simple equations. For reductionist science (the idea that the whole is merely the sum of its parts) medicine was a major boost, where it counted. Everyone gets sick -- and the high-tech reductionist medicine model rushed in to claim victory and establish

a monopoly in the healing of humans. And, of course, in many, many cases, the medical technology (not science) of medicines and surgical tools in the hands of a kindly caring family doctor had worked very effectively. But the reductionist research medical scientist rushed in to claim a monopoly only for the pill or procedure, in total ignorance of the whole-person-aspect of the help given and received by old fashioned family doctors.

What is scaring all reductionist scientists today is that there are now tens of millions of Americans who know by that absolute, scientific test, experience, that whole-person-medicine works (and, as with high-tech medicine, one can be fooled sometimes). That means that citizens are no longer bamboozled by the propaganda that ONLY the reductionist, body only, pill only, tested by double blind and peer review, should ever be allowed on the counter. All over the world, consumers have bypassed the vested interests of the corporate medical establishments and have used their political rights to get their medical choices. That is scary.

The very good news now is, that hundreds of millions will have access to novel whole-person-medicine options which offer healing via the body, mind or spirit routes or any combination thereof. There will no doubt be many phony claims, many mistakes, in whole-person-medicine. But we all remember that there have been some doozies on the high-tech side also: from dangerous diet pills, phony ulcer medications, thalidomide, etc, etc.

The even more significant news is that the triumph (it is nothing less) of whole-person-medicine in the felt experience of millions (including its fair share of scientists), will slowly put all of science back in its rightful place: as one of several complementary ways of knowing and dealing with reality, not only in the healing arts.

© Rustum Roy