POLITICAL? SCIENCE?

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I have accepted over the years that there exists a certain amount of idiotic thinking about nonsensical notions such as astrology, unidentified flying objects, alien abductions, near death visions, remote viewing, cold fusion, and the like.

Lately, however, the acceptance of such notions seems to have become even more widespread than formerly. I believed at first that media attention was the source of this wide acceptance. It is, after all, much more attention-getting to mention on a television news show that someone's health has been miraculously improved by prayer, or by therapeutic touch than to run a later story debunking the original story, and it is the rare television commentator who can analyze junk science or outright fraud on the spot, and the debunking is usually couched in pretty boring scientific terms.

News coverage is really just entertainment, and stories about miraculous cures, cheap energy and remote viewing are much more entertaining than mundane science.

Some of the abuses of science we encounter have to do with promises of health benefits. A few years ago, Vitamin O was being sold to maximize nutrients, purify blood, eliminate toxins and poisons, for $20 for a 2 ounce vial. It turns out Vitamin O was just salt water, and the FDA required the marketers of Vitamin O to cease

advertising, and to refund consumers' money. Homeopathy is another health-related fraud which has a large following. Homeopathy is essentially the prescribing of natural substances which produce symptoms similar to those from which the patient is suffering. The medications are highly diluted, to the point where there are virtually no molecules of the natural substance in the admixture. The claim is then made that the information from the active substance is somehow retained in some way by the water. There have been no experiments to test the idea of the memory of water. Most of such substances are harmless in and of themselves – their harm resides in the fact that many people may be kept from seeking needed legitimate medical treatment.[1]

Anyway, we have always kind of relied upon the government to protect us from the worst excesses of such fraudulent pseudo science, in the form of the Federal Drug Administration, the Department of Agriculture, the Environmental Protection Agency, the Centers for Disease Control, and the like. Now, however, governments and governmental agencies at all levels, federal and state, have weighed in on the side of the nitwits, thimbleriggers and charlatans who apparently view a scientific approach to a problem as no different than any other kind of approach, be it religious, political, commercial or popular.

We are all familiar with the intelligent design versus evolution issue – religious fundamentalists believe that anything as complicated as humans and the universe could only have been designed by some intelligence, and could not therefore have developed over time through the operation of testable natural laws. Such a belief is religious; the existence of a creator has to be accepted on the basis of faith, for which there can be no

scientific tests. Argument ends at the threshold of faith. So far, just a philosophical difference of opinion.

This dispute becomes a little more meaningful, however, when, as has happened in Kansas and Texas, and more recently in Georgia, some of the public schools, which are governmental agencies, have attempted to promulgate intelligent design as an equally plausible scientific alternative to the theory of evolution. Even in Ohio, the idea of including intelligent design in the science curriculum of public schools has gained currency. This becomes the teaching of religious beliefs in science courses – not only contrary to the Constitution of the United States, but also contrary to the basic tenet of science that a model be testable. How do we test for the nature of the designer, and what the designer did, and how he did it? Simple, we can't. The line between what is observable in nature and what is not observable in nature divides science from faith. Because the politicians constituting the boards of education are elected, their first consideration is to get re-elected, and they do not want to antagonize large blocks of voters by taking what they fear will be viewed as an irreligious position. In a 1991 survey, among industrialized so-called "Christian" countries, Americans were found to have the smallest percentage of people who believed that humans evolved from earlier species or animals and the highest percentage who believed in miracles. Intelligent design proponents usually confine themselves to trying to find challenges to the theory of evolution, such as insisting that evolution be replicated in a laboratory, but they do not offer any methodology of testing intelligent design, or using it to make predictions of new phenomena, hallmarks of science.[2]

In another arena, we see politicians intruding upon areas which are more scientific than social or political. In Ohio, and some other states, constitutional amendments and statutes have been adopted to prohibit homosexual marriage. It is pretty well established, as a scientific proposition, that homosexuality is not a matter of individual choice, but is genetically predetermined. Therefore, these constitutional amendments and statutes are discriminatory and punitive and contrary to Article XIV of the United States Constitution. If homosexuals cannot marry, they are denied the legal benefits of marriage, including the right to file joint tax returns, the right to give gifts free of gift or estate taxes, and the right to make final disposition of the remains of a spouse. If these same constitutional amendments and statutes provided, say, that marriage would only be legally recognized between people of the same race, there is little likelihood that they would be advocated by politicians, because race, too, is not a matter of choice. However, failure of politics and politicians to grasp concepts of basic science has led to discrimination and serious damage to a very large number of people, again for the most part because of bigoted religious opposition to homosexuals and the homosexual life style.[3]

The Federal government and in particular the Bush administration are now apparently engaged in a cold-blooded policy to suppress and destroy scientific findings, in order to conform to the government's political policies and goals. We are faced with the phenomena now of the federal government siding with marginal or outright pseudo science.

I will give a few examples.

Abstinence-only is a policy encouraged by the Bush administration as an effective method of avoiding sexually transmitted disease and pregnancy, ignoring uniform, credible science-based performance measures showing that comprehensive sex education programs are effective, and abstinence–only programs are ineffective. The Bush administration has recently instructed the Centers for Disease Control staff to attend sessions devoted to the "Science of Abstinence" conducted by nonscientists. To reinforce this abstinence–only policy, the United States Federal Drug Administration has recently refused to approve the over-the-counter sale of so-called morning after contraceptive pills, in spite of their effectiveness, low cost and lack of side effects. This position is contrary to the recommendation of the Federal Drug Administration's own Reproductive Health Drugs Committee which urged that the pills be available as over-the-counter medications. On top of this, 49 republican members of Congress signed a letter to President Bush urging that this contraception be maintained as prescription-only, because "wide use could result in more sexual promiscuity." As recently as April 1 of this year, the Governor of Illinois had to order pharmacies to fill prescriptions for the pill because many pharmacists refused to do so on the basis of their individual moral conviction.[4]

The United States Department of Agriculture has performed studies showing hazards to human health exist from airborne bacteria coming from farm waste. These studies have never been publicly issued, because they were deemed by the Bush administration to be "politically sensitive and controversial issues requiring discretion," and were ordered withheld. The information obtained here came from a former research microbiologist of the U.S. Department of Agriculture.[5]

The federal government has plans to adjust the flow of the Missouri River, to enable easier and more uniform navigation for grain barges as requested by corporate agriculture. A report of scientists in 2000, in findings confirmed by independent peer review as well as by the National Academy of Science, concluded that the plans would violate the Endangered Species Act. The federal government, in the form of Department of the Interior, amended the original report, concluding that there was little jeopardy to most of the creatures endangered. The amendment was not peer-reviewed, and was issued by a team composed for the most part of non-scientists, and persons with no experience of the Missouri River. It is clear that the scientific findings were set aside in favor of political concerns.[6]

Potential highly-qualified appointees to scientific advisory positions at the National Institute on Drug Abuse and the Army Science Board were rejected because their political views were not congruent with those of the Bush administration, and in both cases the appointees were asked if they had voted for President Bush. In 2002, the scientific committee that advises the United States Department of State on technical matters related to arms control was dismissed entirely, and no new appointees have been made. After the dismissal, John R. Bolton, Under Secretary of State for Arms Control and International Security announced a new committee would be formed, but that has not happened.[7] Perhaps Mr. Bolton has been preoccupied with dealing with subordinates and senate hearings

The federal government has spent millions of dollars financing prayer therapy research, clearly having nothing to do with science because it presupposes some supernatural intervention. Such studies are, on their face, nonsense – what, for example

is a prayer? What is a proper dose of prayer? How do you measure prayer – can someone be praying for something other than a health-related question and still have the prayer be effective? In the April, 2005 issue of The Readers Digest, there is an article prominently headed "New Proof Prayer Works." The article contains mostly anecdotal stories of health benefits to those who prayed or were prayed for. The article mentions research on prayer therapy, pointing out that the National Institutes of Health spent $6.2 million to study the link between health and prayer. No results at the study are cited, but the implication is clear – if the government is spending millions on prayer therapy, there must be something to it. In contrast to its title, however, the article concluded that "whether or not prayers are actually answered doesn't really matter."[8]

Legislatures in Kansas, Oklahoma, Missouri, Tennessee, Texas, Georgia and Mississippi are seeking to remove from school texts references to the Second Law of Thermodynamics, a basic scientific principle essentially stating that entropy increases over time as organized forces decay into greater states of randomness. The reason for this political attempt to repeal the Second Law is that it is believed to be a deeply disturbing principle threatening our understanding of the universe as a benevolent and loving place of divine grace and eternal salvation, and not therefore an optimistic view of the world the Lord created. The consequences of such repeal would, among other disastrous results, pretty much eliminate sunlight because our sun, as well as all stars would be collecting photons rather than emitting solar radiation.[9]

There is, of course, the embryonic stem cell imbroglio, created by the Bush administration by halting funding for such research except as the administration directs.. This has warped science in the public mind. The argument is that embryo stem cells are

embryos and therefore the moral equivalent of human beings, and accordingly biomedical research should not be conducted on these embryonic stem cells, even if the virtually unanimous scientific judgment is that such research will yield great benefits for humans, at least those who have made it past the embryonic stage. The embryonic stem cells are commonly not in fact cells which will develop into complete humans, but are drawn from surplus embryos which would in any event be destroyed.. So if all of us post-embryonic humans are going to be making the sacrifice of not getting the benefits of such research, so as to save the lives and souls of such embryo beings, shouldn't we be mounting an even more intensive effort to save those millions of normally – conceived viable embryos which disappear from human wombs naturally. Research has shown that 60 to 80 percent of such naturally – conceived embryos are flushed out naturally and unnoticed. These embryos, if the moral equivalent of humans to the same extent as embryonic stem cells, amount to many millions more deaths than embryonic stem research, abortion and in vitro fertilization combined.[10]

The Pentagon recently funded a trial to determine the effects of therapeutic touch on burn patients. Therapeutic touch treatment involves a practitioner who holds his or her hands about 4 inches away from the subject individual, and moves them in a rhythmical way to clear congestion of the energy flow of the subject. In the trial, placebo practitioners were utilized – that is, people who were trained to mimic therapeutic touch movements. The practitioners admit, of course, that that the human energy flow cannot be measured. The results of this trial have not been disclosed. However, a fourth-grader named Emily Rosa devised a test, where practitioners of therapeutic touch extended both hands through a blind screen and were asked which hand was near one of Emily's. Of 21

practitioners, only 44% chose the correct hand – less than the 50% chance they had just by guessing. Emily's test was published in the Journal of the American Medical Association. Therapeutic touch nevertheless enjoys a large following, and maintains a number of training centers and websites, so perhaps Emily's little experiment was not given much currency.[11]

The CIA has spent millions of dollars to research remote viewing, in a program known as "Stargate." Remote viewing is the alleged psychic ability to see places, or persons, or anything else not within the range of ordinary senses to make drawings of what was so seen or sensed. In managing the project, the government uses only a single judge to determine how close the drawings of the psychics came to the real thing. The CIA is now "reviewing programs regarding parapsychological phenomena, mostly remote viewing, to determine their usefulness to the intelligence community." Like the therapeutic touch websites, the websites advocating remote viewing all prominently point out that remote viewing was developed and utilized by the U.S. Department of Defense, and the CIA so the government's sponsorship of this foolish psychic research lends it legitimacy.[12]

It is becoming increasing clear that politics is driven by polls, and religiosity; pseudoscience and anti-scientific beliefs trump science. The government can no longer be trusted, and science does not have a bully pulpit to sell itself. Scientific journals do not have broad popular appeal, with their graphs, diagrams and arcane language.

My own recent experience with government–sponsored and funded pseudo-science had to do with the polygraph. The polygraph is commonly called, and used as a

lie detector by police departments, the FBI, the CIA and federal and state governments at all levels. The polygraph is no more a detector of lies than a crystal ball is a detector of the future. The polygraph is a device to record changes in a subject's heartbeat, blood pressure and respiration. The idea is that when people lie, they get measurably nervous. There is no scientific formula or law establishing a regular connection between such physiological changes and lying. There is no scientific evidence that polygraph operators can detect lies using the machine more than any other methods. What the polygraph measures can be caused by many things – nervousness, anger, pain and fear, even having to go to the bathroom.

My own client, against my advice, desired to have a polygraph test administered to him, in the touching, although common, misbelief that he would be proven to be telling the truth. Often, although not in my client's case, the skillful polygraph operator can elicit confessions by establishing with the subject a belief in the efficacy of the polygraph, and then points out to the subject that the machine has "detected" a lie at a crucial question. If the subject believes in the device, he can often be manipulated into a confession because he believes himself to have been caught. Thus, the government uses our own belief in the wonders of science to try to trap the unwary.[13]

A few voices in the wilderness can be heard. In 2004, the Union of Concerned Scientists issued a report entitled "Scientific Integrity in Policymaking: an Investigation in the Bush Administration's Misuse of Science." This report delineates some of the points discussed here, but its bias is so anti-Bush that its message may be undercut. The response of the Bush Administration is that the scientists are playing politics and no specific refutation has been forthcoming. Bush is taking advantage of the current anti-

scientific attitudes, but he is not responsible for them. These attitudes have permeated American thought since at least the anti-Darwin Scopes Monkey trial of 1925. For instance, the Bush administration has proposed a "government-wide rule that will centralize in the White House Office of Management and Budget control of review of scientific information relied upon in policy making at federal agencies. The rule will also prohibit most scientists who receive government funding from serving as peer reviewers, but permits scientists employed or funded by industry to serve as reviewers. The Union's report, however, has no call to action. Its recommendations are pallid. Bush should put an end to practices that undermine the integrity of scientific advisory panels, Congress should conduct oversight hearings and reestablish something like the former Congressional Office of Technology Assessment, scientists should become more engaged and the public should voice its concerns about these issues. Hardly a clarion call.

Another hint of hope is the bill introduced by Representative Henry Waxman, entitled the "Restore Scientific Integrity to Federal Research and Policymaking Act." It prohibits tampering with scientific research by the government, prohibits censoring of scientists who are employed by the government, and protects governmental employees from retaliation. This is unlikely to become law.[14]

There is little relief in sight. Galileo's experiments and conclusions, in spite of government and religious interference and influence, finally were found to be a true reflection of the universe, because these experiments and conclusions, which were somewhat counter-intuitive at the time, were at least accessible to most educated people, then and now.

But now, perhaps, science has become so complex and so abstruse, that it is even beyond the grasp of most educated people. The principles of quantum mechanics, subatomic biology and Einstein's theories are all pretty much beyond the comprehension of most people, and they are certainly counter-intuitive. Thus there is an impulse that if these claims of goofy ideas are being accepted by scientists, why should not other equally goofy ideas be accepted, like remote viewing, therapeutic touch or prayer therapy? Is it any more outlandish to accept the notion of ghosts, or astrology, or unidentifying flying objects, than to accept the notion that observations made at one place will be observed someplace else at the same instant, however far away, or that gravitation is curvature of space–time, not just that some objects are heavy.

Science may have been somewhat hijacked by business, with help from the political process. In 1980, the United States Congress passed the Bayh-Dole Act, which encourages universities to help pay for their scientific explorations by seeking to commercialize applications of their research. Inasmuch as grants will flow to those areas of research most likely to have commercial applications, science may have been warped in the direction of commercialization, particularly favorable to drug companies. This promulgates a cynical view of science – that it is money-driven, and therefore ideas not commercial or profitable may not be useful or valuable science.

The Bush administration has grasped this popular attitude toward science, probably because many of its leaders share the same scientific muddle-headedness and rely upon it to take positions, dispense policies and adopt actions which are anti-science, and no one seems to care! These government efforts to subvert science, and to fund pseudo-science research projects not only operate to support political agendas, but at the

same time, give credence to the notion that anything is possible and acceptable, however outlandish. This has been highly demoralizing to scientists in the employ of government agencies, and a major relocation of scientists to non-governmental opportunities has been observed.

We need a scientific world view, that the universe is orderly, and governed by physical laws, however complex and counter-intuitive. If we do not educate our children in this world view, then the magic shows will ultimately prevail. I don't mean more science education per se, but an educational philosophy into which specific science education can be fitted.

This, it seems to me, is unlikely to happen – perhaps Pax Americana will end because of our willful ignorance – the rest of the world does not seem to be so mired in these quasi – religious pseudo scientific controversies. Enrollment in science and engineering graduate programs in the U.S. by Hispanic and Asians has increased, but overall such enrollment has decreased. We are all familiar with the increasing flight of technological employment and investment opportunities to other countries.

Well, this paper started out as an exercise to explore humorous and outlandish pseudo scientific ideas leavened with only a little personal indignation. My reading has now led me to a state more nearly resembling despair in concluding that the American scientific establishment has been done significant and irreparable harm.

[1] Park, Robert Voodoo Science Oxford, 2000 ("Park")

[2] Ehrlich Robert 8 Preposterous Propositions Princeton, 2003 ("Ehrlich")

[3] Ehrlich

[4] Reasonline, January 12, 2005
New York Times, April 19, 2005
Scientic Integrity in Policymaking, Union of Concerned Scientists, 2004 ("Union Report")

[5] Union Report

[6] Union Report

[7] Union Report

[8] Skeptical Inquirer, July/August 1997

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[10] Reasonline, December 22, 2004

[11] Skeptical Inquirer, July, 1996

[12] Carroll, Robert Todd The Skeptics Dictionary, New York, 2004
Elliston, Jon Parapsychology in Science

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The Polygraph and Lie Detector, National Academic Press, 2003

[14] Restore Scientific Integrity to Federal Research and Policymaking Act, H.R. 839