# The Suppression of Inconvenient Facts in Physics

> "Textbooks present science as a noble search for truth, in which progress depends on questioning established ideas. But for many scientists, this is a cruel myth. They know from bitter experience that disagreeing with the dominant view is dangerous - especially when that view is backed by powerful interest groups. Call it suppression of intellectual dissent. The usual pattern is that someone does research or speaks out in a way that threatens a powerful interest group, typically a government, industry or professional body. As a result, representatives of that group attack the critic's ideas or the critic personally-by censoring writing, blocking publications, denying appointments or promotions, withdrawing research grants, taking legal actions, harassing, blacklisting, spreading rumors." (1)

## Introduction

Science is in a state of crisis. Where free inquiry, natural curiosity and open-minded discussion and consideration of new ideas should reign, a new orthodoxy has emerged. This 'new inquisition', as it has been called by Robert Anton Wilson (2) consists not of cardinals and popes, but of the editors and reviewers of scientific journals, of leading authorities and self-appointed "skeptics", and last but not least of corporations and governments that have a vested interest in preserving the status quo, and it is just as effective in suppressing unorthodox ideas as the original. The scientists in the editorial boards of journals who decide which research is fit to be published, and which is not, the science bureaucrats at the patent office who decide what feats nature allows human technology to perform, and which ones it does not, and the scientists in governmental agencies who decide what proposals to fund, and not to fund, either truly believe that they are in complete knowledge of all the fundamental laws of nature, or they purposely suppress certain discoveries that threaten the scientific prestige of individuals or institutions, or economic interests. Research that indicates that an accepted theory is incomplete, severely flawed, or completely mistaken, is frequently rejected on the grounds that it "contradicts the laws of nature", and therefore has to be the result of sloppiness or fraud. At the heart of this argument is the incorrect notion that *theory overrides evidence*.

In true science, theory always surrenders to the primacy of evidence. If observations are made that, after careful verification and theoretical analysis, are found to be inconsistent with a theory, than that theory has to go - no matter how aesthetically pleasing it is, how much mathematical elegance it contains, how

prestigious its supporters are, or how many billions of dollars a certain industry has bet on it.

This article will show that a different reaction occurs with disturbing regularity. Anomalous evidence is first ignored, then ridiculed, and if that fails, its author attacked. Scientific conferences will not admit it to be presented, scientific journals will refuse to publish it, and fellow scientists know better than to express solidarity with an unorthodox colleague. In today's scientific world, the cards are stacked heavily against true scientific breakthroughs. Too many careers are at stake; too many vested interests are involved for any truly revolutionary advancement in science to take place any more. All too often, scientific truth is determined by the authority of experts and textbooks, not by logic and reason.

In *20th and 21st Century Science: Reflections and Projections* (3) Robert G. Jahn writes:

> Thus, at the dawn of the 21st century, we again find an elite, smugly contented scientific establishment, but one now endowed with far more public authority and respect than that of the prior version. A veritable priesthood of high science controls major segments of public and private policy and expenditure for research, development, construction, production, education and publication throughout the world, and enjoys a cultural trust and reverence that extends far beyond its true merit. It is an establishment that is largely consumed with refinements and deployments of mid-20th century science, rather than with creative advancement of fundamental understanding of the most profound and seminal aspects of its trade. Even more seriously, it is an establishment that persists in frenetically sweeping legitimate genres of new anomalous phenomena under its intellectual carpet, thereby denying its own well-documented heritage that anomalies are the most precious raw material from which future science is formed.

Henry H. Bauer gives a similarly bleak assessment of the state of modern science (4):

> Mainstream orthodoxy routinely resists novelties that later become accepted. (..) Indeed, it may well be that the suppression of unorthodox views in science is on the increase rather than in decline. In Prometheus Bound (1994), John Ziman has outlined how science changed during the 20th century: traditionally (since perhaps the 17th century) a relatively disinterested knowledge-seeking activity, science progressively became handmaiden to industry and government, and its direction of research is increasingly influenced by vested

> interests and self-interested bureaucracies, including bureaucracies supposedly established to promote good science such as the National Academies, the National Science Foundation, and the National Institutes of Health.

In many cases of anomalous evidence that threatens established theories, simple denial of publication suffices to suppress the anomaly. Sometimes, however, renegade scientists manage to capture the attention of the general public, pleading their case to a larger audience that has no vested interest in the validity of the established theories. When that happens, and significant interests are at stake, the scientific establishment may turn nasty and resort to misrepresentation or outright falsification of evidence and to ad-hominem attacks.

### The Cold Fusion Scandal

Such misrepresentation and falsification of evidence happened after Stanley Pons and Martin Fleischman (5) announced in March 1989 that they had achieved fusion by electrochemical means. Several influential US laboratories (Caltech(6), MIT (7), Yale/Brookhaven (8)) reported negative results on Cold Fusion that were based on shoddy experimental work and a misunderstanding of the Pons-Fleischmann claims (9). They gave a hostile hot fusion establishment the excuse it needed to conclude that the claims made by Pons and Fleischmann were bogus. In November 1989, a DOE panel concluded the same after a shallow investigation of only seven month (10).

The late Eugene F. Mallove, who was the Chief Science Writer at the MIT News Office at the time and later founded *Infinite Energy*, a journal dedicated to covering potential new energy sources ignored by mainstream science, played a part in exposing the MIT report as mistaken, possibly fraudulent (11), and resigned in protest over it in 1991. He writes in *Ten Years That Shook Physics* (12) :

> Each of the widely cited 1989 'null' experiments has been found to be deeply flawed in experimental protocols, data evaluation, and presentation. Each, in fact, contained some evidence of excess heat as claimed by Fleischmann and Pons. There is evidence that the MIT data was deliberately altered to erase an indication of excess heat. The altered data was published officially by MIT, and it was included in reports to a government agency under the official seal of MIT. The experiment was paid for out of federal government funds. This report had a dramatic impact on the perception of many scientists and journalists.
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> It is ironic that each of these negative results were themselves the product of the kind of low quality work of which Fleischmann and Pons were accused.

> The difference was that the reports said what the hot fusion community wanted to hear.

Most people, including physicists, continue to be unaware that low-energy nuclear reactions (LENR) are real, and have been verified in hundreds of experiments.

In February 2002, the Space and Naval Warfare Systems Center (SPAWAR) of the United State Navy in San Diego released a 310 page report titled *Thermal and Nuclear Aspects of the Pd/$D_2O$ System* (13) that discusses the overwhelming experimental evidence that the cold fusion effect indeed exists. Dr. Frank E. Gordon, the head of the center's Navigation and Applied Sciences Department, writes in the foreword:

> We do not know if 'Cold Fusion' will be the answer to future energy needs, but we do know the existence of Cold Fusion phenomenon through repeated observations by scientists throughout the world. It is time that this phenomenon be investigated so that we can reap whatever benefits accrue from additional scientific understanding. It is time for government funding organizations to invest in this research.

A March 2003 *New Scientist* article (14) quotes Robert Nowak, an electrochemist and programme manager in chemistry at the Office of Naval Research on the suppression efforts that the Navy research had to overcome:

> From the beginning, the idea was to keep things modest. 'We put less than $1 million a year into the programme,' Nowak says. 'Above that level, the red flags go up.' Saalfeld and Nowak never gave the programme its own line in the ONR's budget, but allotted money to it from miscellaneous funds. 'We were to keep working and we were allowed to publish our results, but we weren't supposed to say a lot about it,' Miles recalls. 'Some people were worried that word would get out and it would jeopardise the navy labs' funding from Congress for other research. We didn't even call it 'cold fusion'. We called it 'anomalous effects in deuterated systems'.
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> ' That was still not enough to keep the sceptics off their backs. 'Fairly prominent individuals within the physics community voiced threats,' Nowak admits. 'They said that they were aware that federal funds were going into cold fusion research and they were going to do what they could to stop it.

Fortunately, these suppressive efforts were not successful and LENR research at SPAWAR has continued. In a paper published in the German journal Naturwissenschaften in 2007, the Navy

researchers reported "undisputable evidence" of the nuclear origin of high-energy particles emitted from a cold fusion cell (15). Unfortunately, these results are still largely being ignored by the scientific mainstream and the general public, despite the fact that they portend a solution to the energy and environmental crisis that threatens our civilization.

The plasma fusion community also reacts with hostility to new concepts for hot fusion that threaten to lead to practical fusion energy soon - and therefore to a gigantic embarrassment for themselves and to an end of decades of lavish government funding. One such idea is *Focus Fusion*. Plasma physicists Eric J. Lerner, Dr. Bruce Freeman and Dr. Hank Oona have proposed an innovative design to achieve hydrogen-boron fusion which, unlike the deuterium-tritium reaction the hot fusion mainstream is trying to create, creates no lethal neutrons. Yet (or therefore?) focus fusion met with stiff resistance from the hot fusion establishment. A 2002 press release of the Focus Fusion Societyw describes the reaction:

> On May 23rd Dr. Richard Seimon, Fusion Energy Science Program Manager at Los Alamos demanded Dr. Hank Oona, one of the physicist involved in the experiment, dissociate himself from comparisons that showed the new results to be superior in key respects to those of the tokamak and to remove his name from the paper describing the results. The tokamak, a much larger and more expensive device, has been the centerpiece of the US fusion effort for 25 years. Seimon did not disputing the data or the achievement of high temperatures. He objected to the comparisons with the tokamak, arguing that it was biased against the tokamak. In addition, Seimon pressured Dr. Bruce Freeman, another co-author of the paper, to advocate the removal of all tokamak comparisons from the paper. "Both of my colleagues in this research have been threatened with losing their jobs if they don't distance themselves from the comparisons with the tokamak," says Lerner who is lead author on the paper. "Both of them had carefully reviewed and approved the paper originally and had endorsed its conclusions. For them to be forced to recant under threat of firing is outrageous. It undermines the very basis of scientific discourse if researchers are not allowed by their institutions to speak honestly to each other."

Just like cold fusion, focus fusion could be the cheap, clean, inexhaustible source of energy that the hot fusion establishment has been promising the world for half a century but failed to deliver.

**Transmutation and "Alchemy"**

If a new class of nuclear reactions can take place under low energy conditions, then it is reasonable to expect even transmutations of heavy elements. But to conventional chemistry and physics, the claim of heavy elemental transmutations occurring in "chemical" systems, apparently validating the ancient proto-science of alchemy, constitutes an even greater provocation than cold fusion.

John Bockris, a distinguished professor of chemistry at Texas A&M and one of the world's leading electrochemists, had to learn this lesson in the early years of the cold fusion scandal. He successfully replicated the Pons and Fleischmann experiment in 1989 and discovered bursts of tritium production.

He then became one of the principal targets of a smear campaign against cold fusion research by science journalist Gary Taubes. Taubes was writing a book on Cold Fusion and had already made up his mind that cold fusion was "pathological science". He spent time with Bockris and his students at Texas A&M, posing as a disinterested investigator. There, he got the idea that Nigel Packham, one of Bockris' graduate students had "spiked" the cold fusion cell with tritium. The allegation was utterly baseless, but Taubes was out for blood and needed to have his scandal. He got *Science* to publish his allegations in June 1990 (16). Bockris called the editor and asked for the right to publish a detailed response, but his request was denied. Eventually, he managed to get a one-column letter published denying the allegations. Publication of Taubes' paranoid delusions in *Science* gave them wide credence and circulation.

A fair-minded Nov 1998 article in *Wired* (17) sets the record straight:

> 'We thought Taubes was genuine at first,' Bockris told me recently, speaking in a clipped, precise British accent that he acquired before he moved to the United States in 1953. 'We exposed our lab books to him, and told him our results. But then he said to Packham, my grad student, 'I've turned off the tape, now you can tell me - it's a fraud, isn't it? If you confess to me now, I won't be hard on you, you'll be able to pursue your career.
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> (Taubes has been shown Bockris's statement. He prefers not to comment.)
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> According to Bockris, 'A postdoctoral student named Kainthla, and a technician named Velev, both detected tritium and heat after we took Packham off the work because of the controversy. Since then, numerous people have obtained comparable results. In 1994, I counted 140 papers reporting tritium in low-temperature fusion experiments. One of them was by Fritz Will, the president of The Electrochemical Society, who has

> an impeccable reputation.

Taubes's June 1990 report in *Science* reassured many people that cold fusion had been bogus all along. Packham received his PhD, but only on condition that all references to cold fusion be removed from the body of his thesis. Today he works for NASA, developing astronaut life-support systems. "I don't know why Gary Taubes wrote what he did," he says. "Certainly I did not add any tritium in my experiment.

But for Bockris, the worst was yet to come. In 1991, he was approached by a self-taught inventor without formal scientific credentials from Tennessee named Joe Champion who claimed that he had discovered a process that could perform heavy element transmutation. Bockris eventually brought Champion to Texas A&M as a consultant and started experiments to replicate the claimed results. In 1993, the local media got wind of the research and made it widely known that medieval alchemy was being performed at the university! This lead to a second, even nastier witch hunt against Bockris. (23) distinguished professors at Texas A&M signed a petition to the provost asking that Bockris be stripped of his title, and 11 full professors in the chemistry department wrote a letter asking that Bockris be removed from the department. The petition stated (18) :

> For a trained scientist to claim, or support anyone else's claim to have transmuted elements is difficult for us to believe and is no more acceptable than to claim to have invented a gravity shield, revived the dead or to be mining green cheese on the moon. We believe that Bockris' recent activities have made the terms 'Texas A&M' and 'Aggie' objects of derisive laughter throughout the world...

Bockris was subsequently investigated for fraud, based on charges that he was trying to defraud investors with false claims of being able to manufacture gold. He was "completely exonerated" only one week after a hearing in which he had been allowed to present his research and defend himself in January 1994.

The professors in the department of chemistry who had initiated the investigation, lead by distinguished professor Frank A. Cotton, were disappointed at this outcome. So they secretly formed a committee to start yet another investigation. Bockris learned of the existence of this "Ad Hoc Committee" only when information of its existence was leaked to the press in June 1994. In classical totalitarian fashion, he was subsequently denied the right to defend himself before the committee and even to know what the charges were. He later learned that he was being investigated because his results were "impossible".

After 11 months of investigation, Bockris was exonerated again in May 1995. But the official investigation is only part of the story. An article in *Infinite Energy* (19) which describes the entire

affair in full details suggests a psychological explanation for the unscientific conduct of Bockris' colleagues:

> One of the most difficult aspects of the treatment to which Bockris was subjected was social ostracism, starting with Dean Kemp's accusation and not even ending with the second exoneration. There were about sixty-five professors in the large Chemistry Department at Texas A&M. Most ignored Bockris for much of the two-year period in which the University, egged-on by ring-leaders in the Department, acted against him. After the first complete exoneration, two professors did congratulate him, but he was isolated. Bockris' wife Lilli felt it perhaps more than he, because she had a number of faculty wives whom she had known as friends. When she met them now in the supermarket, instead of having the usual kindly chat, they turned their backs on her. Lilli recalls that the year she spent in Vienna after the Nazis took over seemed to her less unpleasant and threatening than the isolation and nastiness which she felt in College Station, Texas from 1993 through 1995.
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> One would have thought that after all that had been done, everything would be settled now. This was not the attitude of many of Bockris' colleagues. The motivating force for the antipathy may be the subconscious fear that the discoveries of the Bockris group might eventually be proved and recognized. Then his original contributions would be rated as discoveries of great magnitude. There were at least two professors in the Chemistry Department who had made it known that that they expected to receive the Nobel Prize in Chemistry some day. The possibility that it might go instead to a colleague whose work they so much denigrated must have been an unwelcome thought. (They did not have the attitude of physicist Richard Feynman, who was displeased by the artificial focus on one person's accomplishment that the Nobel Prize system encouraged.)
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> Having failed in the three official investigations that had been carried out against Bockris, they decided that all they could do would be to persuade the head of the department to have Bockris shunned—as in an excommunication for religious heresy. No one was supposed to speak with the errant Bockris. For a long time, absorbed in his work as ever, he didn't understand that shunning was underway. Most of the colleagues had been ignoring him anyway since the inquiries had begun in 1993. He did notice, however, that whenever he wanted to talk to the

> Head of the Department, perhaps once every few months, he came to his office and did not invite Bockris to come to his. Of course, he was more than twenty years younger than Bockris, but later Bockris realized that this was an example of the shunning. The Head did not want anyone to see that he was talking collegially with Bockris!
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> Bockris' colleagues in the physical chemistry division took no notice of the shunning order, which might have gone around unofficially. In practice, the shunning made no effective difference to how Bockris carried out his work, though it was a very considerable act of spite. It proved once again that at least in the Chemistry Department at Texas A&M University, research results which do not agree with existing theory are not tolerated."

The Wired article suspects financial motives behind the scientific establishment's anti-scientific witch hunt: (17)

> Financial factors may have played a part in the fierce animosity exhibited toward cold fusion experiments. When a congressional subcommittee suggested that $25 million could be diverted from hot fusion research to cold fusion, naturally the hot fusion scientists were outraged."

Today, the evidence that transmutation of heavy elements can occur in electrochemical systems has become fairly strong. Yasuhiro Iwamura, Mitsuru Sakano and Takehiko Itoh of the Mitsubishi Advanced Technology Research Center have shown reproducible transmutation of Cesium (Z=55) into Praseodymium (Z=59) and Strontium (Z=38) into Molybdenum (Z=42) in a deuterium-palladium system. Their results were published in the Japanese Journal of Applied Physics. (20)

These results have been independently replicated by Higashiyama et al at Osaka University and were presented at the Tenth International Conference on Cold Fusion in Cambridge, Massachusetts in August 2003. (21)

At **www.lenr-canr.org** the interested reader can find a comprehensive collection of papers on Low Energy Nuclear Reactions.

### Special Relativity Theory: Beyond Criticism

Einstein's special theory of relativity, published in 1905, is one of the foundational theories of modern physics. It states that the vacuum speed of light is the same for all observers in inertial (non-accelerated) reference frames, and that time and space coordinates combine in a peculiar way when measured from different inertial systems. Exactly how this happens is described by a set of equations called the *Lorentz Transformation*.

Strictly speaking, special relativity theory does not apply to anything in the physical universe, since gravitational fields, however minute, are always present. It took Einstein about 10 years to incorporate gravity and acceleration into his theory, and the result is known as *general relativity*. It describes gravity not as a force, but as curvature of space-time caused by mass. According to general relativity, there can be no such thing as a gravity shield.

Despite the consensus of a majority of physicists that special relativity is proven beyond a shadow of a doubt, and general relativity proven at least with a high degree of confidence, there are reasonable arguments and pieces of evidence againstthese theories. But relativity dissidents are routinely censored from presenting their ideas at conferences or having them published in the scientific literature. John E. Chappell, Jr., the late director of the Natural Philosophy Alliance (an organization of relativity critics), relates the following suppression story: (22)

> One of the most recent [suppression stories] comes from a new NPA member who, when doing graduate work in physics around 1960, heard the following story from his advisor: While working for his Ph.D. in physics at the University of California in Berkeley in the late 1920s, this advisor had learned that all physics departments in the U.C. system were being purged of all critics of Einsteinian relativity. Those who refused to change their minds were ordered to resign, and those who would not were fired, on slanderous charges of anti-Semitism. The main cited motivation for this unspeakably unethical procedure was to present a united front before grant-giving agencies, the better to obtain maximal funds. This story does not surprise me. There has been a particularly vicious attitude towards critics of Einsteinian relativity at U.C. Berkeley ever since. I ran into it in 1985, when I read a paper arguing for absolute simultaneity at that year's International Congress on the History of Science. After I finished, the Danish chairman made some courteous remarks about dissidents he had learned about in Scandinavia, and then turned to the audience for questions. The first speaker was one of a group of about 4 young physics students in the back. He launched immediately into a horrible tirade of verbal abuse, accusing me of being entirely wrong in my analysis, a simplification of the Melbourne Evans analysis-'Evans is wrong; you are wrong,' he shouted. He accused me of being way out of line to present my 'faulty' arguments on his prestigious campus. When I started to ask him 'Then how would you explain...', he loudly interrupted me with 'I don't have to explain anything.' The rest of the audience felt so disturbed by all this, that the question session was essentially destroyed."

Such reactions are not uncommon. To even begin to criticize Einsteins's theory of special relativity has become a scientific heresy of the highest order. The prevailing attitude of the physical establishment is that anyone who doubts the validity of this "bedrock of modern physics" is insane, and that trying to refute it is a symptom of "psychosis"(23).

Caltech Professor David L. Goodstein states in a video-tape lecture: (24)

> There are theories in science, which are so well verified by experience that they become promoted to the status of fact. One example is the Special Theory of Relativity-it's still called a theory for historical reasons, but it is in reality a simple, engineering fact, routinely used in the design of giant machines, like nuclear particle accelerators, which always work perfectly. Another example of that sort of thing is the theory of evolution. These are called theories, but they are in reality among the best established facts in all of human knowledge."

Isaac Asimov has stated that "no physicist who is even marginally sane doubts the validity of SR." (25)

An article on relativity dissidents (26) quotes relativist Clifford Will of Washington University expressing a similar sentiment:

> SR has been confirmed by experiment so many times that it borders on crackpot to say there is something wrong with it. Experiments have been done to test SR explicitly. The world's particle accelerators would not work if SR wasn't in effect. The global positioning system would not work if special relativity didn't work the way we thought it did.

Unfortunately for the progress of physics, when opinions like these reach a critical mass, they become self-fulfilling prophecies. Dissent is no longer respected, or even tolerated. Evidence to the contrary can no longer be communicated, for journals will refuse to publish it (23). Mathematically and logically, the notion that a theory that has made many correct predictions or leads to engineering applications must necessarily be true is untenable. Wrong models can make correct predictions. Scientific models may produce arbitrarily many, arbitrarily good predictions and still be flawed, as the historical example of the Ptolemaic (geocentric) model of the solar system shows. It does not matter how many observations are consistent with a theory if there is only one observation that is not. Ironically, relativity theory itself teaches us this lesson.

For centuries, Newtonian physics had led science to one triumph after another in explaining the inner workings of the natural world, and at the end of the 19th century, no physicist who was

"even marginally sane" doubted its validity. After all, hadn't the validity of Newtonian physics "been confirmed by experiment so many times" that it would have "bordered on crackpot to say there is something wrong with it"? Didn't the operation of the world's steam engines prove its validity? And yet, Newtonian physics loses its validity at speeds approaching the speed of light. In hindsight, it is obvious why the discrepancy was never caught. Due to the enormity of the speed of light c, effects of the order of (v/c) only manifest themselves in highly sophisticated experiments. Similarly, even modern technology cannot easily distinguish between relativity and competing theories that agree with relativity at first order of (v/c) but disagree at higher order. One such competing theory is Ronald Hatch's Modified Lorentz Aether Theory (27).

Hatch, a former president of the Institute of Navigation and current Director of Navigation Systems Engineering of NavCom Technologies, is an expert on the GPS. Concerning the question of whether the operation of the GPS proves the validity of SR, he has come to conclusions diametrically opposite from Clifford Will's. In *Relativity and GPS* (28), (29), he argues that the observed effect of velocity on the GPS clocks flat out contradicts the predictions of special relativity.

Hatch's proposed alternative to special and general relativity theory, Modified Lorentz Aether Gauge Theory (MLET), agrees with General Relativity at first order but corrects many astronomical anomalies that GRT cannot account for without ad-hoc assumptions, such as the anomalous rotation of galaxies and certain anomalies in planetary orbits. In addition, the force of gravity is self-limiting in MLET, which eliminates point singularities (black holes), one of the major shortcomings of GRT. One of the testable predictions of Hatch's theory is that LIGO, the Laser Interferometer Gravitational Wave Observatory, will fail to detect gravity waves. As of July 2007, this prediction stands. (30)

**The myth of the null result of the Michelson-Morley experiment.**

Relativity textbooks all contain the story of how the Michelson-Morley experiment (28) supposedly proved the non-existence of a light-carrying medium, the aether. In this experiment, light rays are sent on round trips in different directions and then reunited, resulting in an interference pattern. If an aether "wind" caused the speed of light to be direction-dependent, then rotation of the experimental apparatus would result in a shift of this pattern. But such a shift was never detected, proving the isotropy (direction-independence) of the speed of light, or so the story goes.

But physical reality is more complicated then the foundational myth of relativity would have us believe. An examination of historical papers on the subject indicates that relativists have rewritten history. The M-M experiment of 1887 found only a fraction of the effect size predicted by the stationary aether hypothesis, thus clearly disproving it, but the effect was

emphatically not "null" within the accuracy of the experiment.

In a 1933 paper, *The Aether-Drift Experiments and the Determination of the Absolute Motion of the Earth* (31), physicist Dayton C. Miller reviewed the evidence and concluded that

> The brief series of observations was sufficient to show that the effect did not have the anticipated magnitude. However, and this fact must be emphasized,the indicated effect was not zero; the sensitivity of the apparatus was such that the conclusion, published in 1887, stated that the observed relative motion of the earth and aether did not exceed one-fourth of the Earth's orbital velocity. This is quite different from a null effect now so frequently imputed to this experiment by the writers on Relativity.

Miller showed that there is a systematic effect in the original M-M data indicating a speed of the Earth relative to the Aether of 8.8 km/s for the noon observations and 8.0 km/s for the evening observations. He believed that the aether was entrained ("dragged along") by the earth. To test that hypothesis, Miller endeavored to replicate the M-M experiment (which had been performed in a basement in Cleveland) at greater altitude on Mount Wilson, where presumably there would be a stronger aether drift.

After years of careful experimentation, Miller indeed found a systematic deviation from the null result predicted by special relativity, which greatly embarrassed Einstein and his followers. Einstein tried to explain it away as an artifact of temperature variation, but Miller had taken great care to avoid precisely that kind of error. Miller told the *Cleveland Plain Dealer* on January 27, 1926,

> The trouble with Professor Einstein is that he knows nothing about my results. ... He ought to give me credit for knowing that temperature differences would affect the results. He wrote to me in November suggesting this. I am not so simple as to make no allowance for temperature.

But the tide of scientific opinion had turned against the aether and in favor of Einstein.

The 1919 solar eclipse observations led by Sir Arthur Eddington that allegedly confirmed general relativity's prediction of the deflection of starlight by a gravitational field were not accurate enough to test Einstein’s prediction, and confirmation was obtained by reading the desired result into the data. (32) This "confirmation" was triumphantly announced by Eddington at a joint meeting of the Royal Society and the Royal Astronomical Society to an audience that had not actually seen the data first hand. In the judgement of an eye witness, the meeting resembled

a coronation ceremony rather than a scientific conference (33).

Because of this scientific fraud, Einstein became a world celebrity overnight, surrounded by an aura of scientific infallibility. Miller's results, which suggested that in order to detect anisotropies in the speed of light, the interferometer needed to be surrounded by as little matter as possible, and located at a high altitude, were ignored in subsequent null replications of the experiment, such as the Brillet-Hall experiment (34), and the Müller experiment(35).

After Miller's death, one of his students, Robert S. Shankland, gave the physics establishment the final excuse it needed to forget Miller's work for good (36). Shankland simply revived the old criticism of temperature variations, against which Miller had always successfully defended himself during his lifetime, to reach the conclusion that Miller's results must be invalid. Relativity skeptic James DeMeo, Ph.D., has undertaken a detailed review of Miller's work and Shankland's critique (37) that comes to the conclusion that the Shankland team

> with some degree of consultation with Einstein, decided that 'Miller must be wrong' and then set about to see what they could find in his archive that would support that conclusion.

A 2003 paper by Reginald T. Cahill and Kirsty Kitto of the School of Chemistry, Physics and Earth Sciences at Flinders University, Adelaide, published in the dissident journal Apeiron (38), argues that the reason why earlier M-M experiments gave small but detectable non-null results, while more recent replications gave clear null results, is that the earlier interferometers were filled with gas, while the modern ones were evacuated. It presents a new unified analysis of M-M type experiments that derives consistent estimates of the absolute speed of the Earth from gas-mode M-M experiments while predicting the observed null result for vacuum-mode experiments.

In a later paper (60), Cahill charges that the evidence for absolute motion is not being considered by mainstream physics not because it is weak, but because it is being censored:

> Physics is a science. This means that it must be based on (i) experiments that test its theories, and (ii) that its theories and reports of the analyses of experimental outcomes must be freely reported to the physics community. Regrettably, and much to its detriment, this has ceased to be the case for physics. Physics has been in an era of extreme censorship for a considerable time; Miller was attacked for his major discovery of absolute linear motion in the 1920's, while DeWitte was never permitted to report to physicists the data from his beautiful 1991 coaxial cable experiment. Amazingly

> these experimenters were unknown to each other, yet their data was is in perfect agreement, for by different techniques they were detecting the same phenomenon, namely the absolute linear motion of the earth through space. All discussions of the experimental detections of absolute motion over the last 100 years are now banned from the mainstream physics publications.

In 2004, Cahill's analysis found a mainstream advocate in Maurizio Consoli, a physicist at the Italian National Institute of Nuclear Physics. Consoli managed to get this idea published in the mainstream physics journal Physics Letters A (39). A 2005 *New Scientist* article (40) reports that the quantum optics group at Humbold University, Berlin was interested in performing a gas-mode version of the M-M experiment. At the time of this writing (October 2007), no results have been published, and it is unknown to this writer whether this crucial experiment which could overturn our entire understanding of nature is still being planned.

#### Is the Speed of Light in Interplanetary Space a Constant?

The late physicist Bryan G. Wallace discovered in 1961 that radar distance measurements of the surface of the planet Venus did not support the constancy of the speed of light. There were systematic variations in the radar data containing diurnal, lunar and synodic components. Attempting to get his results published in *Physical Review Letters*, he encountered great resistance from referees, and eventually settled for a lesser journal (41).

In a letter to *Physics Today* (42) Wallace summarizes his findings as follows:

> The 1961 interplanetary radar contact with Venus presented the first opportunity to overcome technological limitations and perform direct experiments of Einstein's second postulate of a constant light speed of c in space. When the radar calculations were based on the postulate, the observed-computed residuals ranged to over 3 milliseconds of the expected error of 10 microseconds from the best [general relativity] fit the Lincoln Lab could generate, a variation range of over 30,000%. An analysis of the data showed a component that was relativistic in a c+v Galilean sense.

Let us do a reality check here. If the speed of light in interplanetary space is non constant, how could NASA not have noticed in its robotic exploration of the solar system? Wallace makes the scandalous claim that NASA *has* noticed, and has been using equations with non-relativistic components to calculate signal transit times in the solar system all along:

> At the December 1974 AAS Dynamical Astronomy Meeting, E. M. Standish Jr of JPL reported that significant unexplained systematic variations existed in all the interplanetary data, and that they are forced to use empirical correction factors that have no theoretical foundation.(43)

In a 1973 paper (44), Wallace describes how the Lincoln Lab introduced averaging to suppress the anomalous radar results and refused to release the raw data to him, stonewalling his investigation.

> The apparent improvement in the residuals for later years was due to the fact that the Lab interpolated the 1964 [Venus] data to 12:00 UT and the 1967 data to one observation a day from 2:12 UT to 2:21 UT. The observing time for the 1961 data ranged from 00:33 UT to 23:40 UT. The involved radar astronomers are publicly claiming nearly complete agreement between their recent radar analysis and general relativity, but my investigation reveals otherwise. At the Fourth Texas Symposium of Relativistic Astrophysics, I.I. Shapiro of the Lincoln Lab promised to send me any data I wanted. I read in an article published by the lab that they had data for the same observing dates covering a wide range of daily observing times from both the MIT and USSR radar stations. I wrote Shapiro requesting this data 2/13/69; his letters of 2/28/69 and 3/12/69 ignored my request. I made an issue of this in my letter to him of 3/20/69, and in his reply of 3/27/69 he stated, 'Unfortunately the data do not exist in the form in which you wanted them and hence, I cannot honor your request.'
>
> Shapiro later sent me data that were completely worthless for making an objective test of the relative velocity of light in space. The data were from two MIT radar stations in Massachusetts. The separation between them was only 0.2' of longitude and 20.6" of latitude and the observations had been interpolated to 2:12 UT to 2:21 UT with only one observation per day. It seems obvious that the Lab eliminated the variations by interpolating the data for each day to the one observing time for that day that agreed with the general relativity prediction. One could use the same method to prove that a stopped clock keeps perfect time.

A subsequent letter submitted to *Physics Today* on July 9, 1984 was denied publication. Wallace reproduced this letter in the chapter *Publication Politics* of his self-published online book *The Farce of Physics* (45). In it, he wrote

> "During a current literature search, I requested and

> received a reprint of a paper [T. D. Moyer, Celes. Mech., 23, 33(1981)] published by Theodore D. Moyer of the Jet Propulsion Laboratory. The paper reports the methods used to obtain accurate values of range observables for radio and radar signals in the solar system. The paper's (A6) equation and the accompanying information that calls for evaluating the position vectors at the signal reception time is nearly equivalent to the Galilean c+v equation (2) in my paper RADAR TESTING OF THE RELATIVE VELOCITY OF LIGHT IN SPACE. [B. G. Wallace, Spectros. Lett., 2, 361(1969)] The additional terms in the (A6) equation correct for the effects of the troposphere and charged particles, as well as the general relativity effects of gravity and velocity time dilation.
>
> The fact that the radio astronomers have been reluctant to acknowledge the full theoretical implications of their work is probably related to the unfortunate things that tend to happen to physicists that are rash enough to challenge Einstein's sacred second postulate. Over twenty-three years have gone by since the original Venus radar experiments clearly showed that the speed of light in space was not constant, and still the average scientist is not aware of this fact! This demonstrates why it is important for the APS to bring true scientific freedom to the PR journal's editorial policy.

Supporting evidence comes from Ronald Hatch who finds that the NASA equations for interplanetary navigation follow his MLET theory rather than special relativity: (27)

> The experimental evidence is almost overwhelming in support of the MLET view. There is a large disjoint between the SRT theorists and the experimentalists. The SRT theorists continue to claim that the speed of light is automatically the velocity c and isotropic with respect to the moving observer or experiment. But the SRT experimentalists do what is necessary to explain and make sense of the measurements. The equations for tracking and navigating the interplanetary probes developed by the Jet Propulsion Laboratory (JPL) for NASA clearly follow the MLET template."

Mr. Wallace died on April 19, 1997, his findings ignored and thus neither confirmed nor refuted by the physics establishment. The question remains: Is the speed of light in interplanetary space subject to systematic variations in time?

### Big Bang Cosmology - Beyond Empirical Falsification

Big Bang Cosmology, which is built on general relativity theory,

is forced to use a number of adjustable parameters and ad-hoc assumptions to agree with observation, such as inflation, the assumption that most of the mass of the universe must consist of 'dark matter', a kind of matter that cannot be detected, but nevertheless must exist, for the sole reason that big bang theory requires it, and now the latest fad, "dark energy", another unobservable quantity that is nevertheless accepted by cosmologist as real because it is needed to save big bang cosmology from empirical falsification.

Two of the three vaunted "predictions" of big bang theory - the light element abundances and the temperature of the microwave background are actually *retrodictions* meaning that big bang theory failed to predict them quantitatively correctly and was then adjusted after the data came in to fit the observational evidence (46).

The third, the Hubble expansion, is entirely a figment of the imagination, as veteran astronomer Halton Arp has pointed out for decades. There are ample examples of high-redshift quasars that are physically connected to low-redshift galaxies, and there is evidence that red shift is quantized. But astronomy has failed to self-correct, and the only acknowledgement Arp received from the scientific establishment was to be largely (though not completely (47)) banned from publication in scientific journals or from speaking at conferences, and to be denied telescope time. (48)] After being told at Caltech that his research "was judged to be without value", he found scientific asylum at the Max Planck Institut für Astrophysik in Munich, Germany, where he was allowed to continue his work. But suppression continued. In *Seeing Red: Redshifts, Cosmology and Academic Science*, Arp relates the following story (49):

> 'Just another isolated case'. Your eye slid over that phrase because you wanted to see whether the referee was going to recommend publication. The answer was: not for the Astrophysical Journal Letters. *The message behind the smooth, assured phrase was clear: 'No matter how conclusive the evidence, we have the power to minimize and suppress it.' What was the observation this time? Just two X-ray sources unmistakably paired across a galaxy well known for its eruptive activity. The paper reported that these compact sources of high-energy emission were both quasars, stellar-appearing objects of much higher redshift than the central galaxy, NGC4258. Obviously, they had originated from the galaxy, in contradiction to all official rules. Slyly, the referee remarked that 'because there was no known cause for such intrinsic, excessive redshifts the author should include a brief outline of a theory to explain them.'*
>
> *My mind flashed back through 30 years of evidence, ignored by people who were sure of their*

> *theoretical assumptions. Anger was my only honest option- but stronger than that provoked by worse 'peer reviews' because this was not even my paper. I did not have to stop and worry that my response was ruled by wounded personal ego. How did this latest skirmish begin? Several years earlier an X-ray astronomer had come into my office with a map of the field around NGC4258. There were two conspicuous X-ray sources paired across the nucleus of the galaxy. He asked if I knew where he could get a good photograph of the field, so he could check whether there were any optical objects that could be identified with the X-ray sources. I was very pleased to be able to swivel my chair around to the bookshelves in back of me and pull out one of the best prints in existence of that particular field. I had taken it with the Kitt Peak National Observatory, 4-meter telescope about a dozen years previously. (..)*
>
> *Wolfgang Pietsch quickly found a small pointing correction to the satellite positions and established that his X-ray pair coincided with blue stellar objects at about 20th apparent magnitude. At that instant I knew that the objects were almost certainly quasars, and once again experienced that euphoria that comes at the moment when you see a long way into a different future. In view of the obvious nature of these objects I felt Pietsch showed courage and scientific integrity in publishing the comment: 'If the connection of these sources with the galaxy is real, they may be bipolar ejecta from the nucleus.'* "

Arp then describes how establishment obstruction delayed the necessary confirmatory observation for two years.

> Then the dance of evasion began. It was necessary to obtain optical spectra of the blue stellar candidates to confirm that they were quasars and ascertain their redshifts. A small amount of time was requested on the appropriate European telescope. It was turned down. (..) The Director of the world's largest telescope in the US requested a brief observation to get the redshifts. It was not done. The Director of the X-ray Institute requested confirmation. It was not done. Finally, after nearly two years, E. Margaret Burbidge with the relatively small 3-meter reflector on Mount Hamilton, on a winter night, against the night sky glow from San Jose, recorded the spectra of both quasars. It was fortunate that mandatory retirement had been abolished in the US, because by this time, Margaret had over 50 years of observing experience. Of course, the referee report from which I quoted was

> directed against her paper, which reported this important new observation".

Arp concludes and generalizes,

> What was particularly appalling about this series of events was that Margaret Burbidge was someone who had given long and distinguished service to the scientific community. Professor at the University of California, Director of the Royal Greenwich Observatory and President of the American Association for the Advancement of Science among other contributions. It seems it was permissible to let her fly anywhere in the world doing onerous administrative tasks, but her scientific accomplishments were not to be accorded elementary scientific respect and fair treatment.
>
> Some would argue that this is a special case, owing to the climate of opinion where the offices of the Astrophysical Journal Letters are located. But, as events in the following chapters make clear, the problem is pervasive throughout astronomy, and, contrary to its projected image, endemic throughout most of current science. Scientists, particularly at the most prestigious institutions, regularly suppress and ridicule findings which contradict their current theories and assumptions.

G. Burbidge gives the following devastating summary of the anti-scientific conduct of the astrophysical establishment:(50)

> The existence of a class of objects which have redshifts not largely due to the cosmic expansion was not predicted either in the hot big bang cosmology or in QSSC. How is this phenomenon dealt with in each hypothesis? As far as that big bang model is concerned its supporters are in complete denial. They never mention the observational evidence, do not allow observers who would like to report such evidence any opportunity to do this in cosmology conferences, argue against its publication, and if forced to comment on the data, simply argue that they are wrong.

Astronomer Thomas Van Flandern has essentially argued that Big Bang cosmology does not qualify as science anymore: (46)

> The Big Bang (..) no longer makes testable predictions wherein proponents agree that a failure would falsify the hypothesis. Instead, the theory is continually amended to account for all new, unexpected discoveries. (..) Perhaps never in the history of science has so much quality evidence accumulated against a model so widely accepted

> within a field (..) One must wonder why, in this circumstance, four good alternative models are not even being comparatively discussed by most astronomers.

One of these models is Quasi-Steady State Cosmology (QSSC) proposed in 1993 by Hoyle, Burbidge and Narlikar. Another one is Plasma Cosmology, developed by Hannes Alfvén.

In **An Open Letter to the Scientific Community**, Eric Lerner has charged that

> (..) Virtually all financial and experimental resources in cosmology are devoted to big bang studies. Funding comes from only a few sources, and all the peer-review committees that control them are dominated by supporters of the big bang. As a result, the dominance of the big bang within the field has become self-sustaining, irrespective of the scientific validity of the theory. (51)

**Anti-Gravity**

In 1992, Russian scientist Eugene Podkletnov published claims to have observed partial gravitational shielding above a rotating superconductor (51). The scientific establishment reacted with scorn and dismissed the claims on a-priori grounds (52):

> Most physicists laughed at Podkletnov's report. Riley Newman, a professor of physics at UC Irvine who has been involved in gravity research for 20 years, typified the reaction when he commented, 'I think it's safe to say gravity shielding is not conceivable.' Like many scientists, he felt that Podkletnov must have made a mistake, measuring magnetic fields or air currents instead of genuine weight reduction.
>
> And yet, few of Podkletnov's critics actually bothered to read his description of his work. Their reaction was so dismissive, it almost sounded like prejudice. From their perspective he was an outsider, a nonmember of the 'gravity establishment.' They couldn't believe that a major discovery in physics had been made by such a no-status dilettante fooling around at some obscure lab in Finland.

Podkletnov's claims received major publicity in 1996, when a British newspaper reported that a followup paper was about to be published in the British *Journal of Physics D*. Podkletnov later withdrew the paper under curious circumstances:

> But Podkletnov has now withdrawn the paper, just weeks before it was due to appear. His decision follows a bizarre series of developments triggered

by media interest in the device. Earlier this month Tampere University issued a carefully worded statement denying all knowledge of the antigravity research. While admitting that it had been involved in some preliminary experiments done by Podkletnov in the early 1990s, the university said he was no longer on the staff.

Suspicions deepened when Vuorinen, the supposed coauthor of the paper, issued a statement denying that he had ever worked on antigravity with Podkletnov.

The furore appears to have surprised Podkletnov, who insists that the claims made in the paper are genuine. But he says the university is correct in denying the existence of any recent research, as the paper centers on experiments carried out in 1992.

On the key issue of Vuorinen's denial of involvement in the work, Podkletnov says that there must have been some confusion over names, and that another Petri Vuorinen was the true coauthor. Podkletnov does have an unpaid affiliation with Tampere's Institute of Material Science. However, inquiries have failed to uncover anyone with a similar name at the university who admits to working on the antigravity research.

The controversy also appears to have shocked the Institute of Physics, which publishes the Journal of Physics D. Three referees failed to find any major flaw in the paper's claims, which if confirmed would rate as one of the greatest scientific breakthroughs in history.

Gravity is the most ubiquitous force in the Universe, and no one has ever found any way of shielding matter from its effects. The discovery of a shielding effect would have huge theoretical and commercial implications.

Faced with Tampere University's statement, and Vuorinen's denial that he was involved, Richard Palmer, managing editor of the journal, decided to put the paper on hold pending further inquiries. Three days later, on 9 September, Podkletnov solved the institute's dilemma by withdrawing his paper. He gave no reason. But he stands by his claims: 'This is an important discovery and I don't want it to disappear,' he told New Scientist.

The paper may now never appear in any physics journal: Podkletnov is said to have been put under pressure from unknown 'funding agencies' not to

> reveal any more, pending patent applications.
>
> Even so, the mystery of the antigravity machine lingers. What is known is that the paper had passed scrutiny by independent experts in superconductivity, and had been accepted by a reputable journal. Tampere University itself concedes that Podkletnov has a good reputation for research, and refuses to pass judgment on whether the antigravity machine actually works." (53)

Podkletnov was subsequently thrown out of the university. But despite the controversy, NASA's Marshall Space Flight Center in Alabama decided to investigate his claims (54). The first attempt at replication failed, but it had been conducted without sufficient knowledge of the original experiment (55). A second replication attempt was never completed due to lack of funding.

Podkletnov now says that he can generate repulsive force beams. Journalist Nick Cook reported the following in a 2002 London Financial Times article:

> Meanwhile, Mr Podkletnov, now based at the Moscow Chemical Scientific Research Center, has taken his ideas further. Last year he published another paper - backed by Giovanni Modanese, an Italian physicist, detailing work on an 'impulse gravity generator' that is capable of exerting a repulsive force on all matter.
>
> Using a strong electrical discharge source and a superconducting 'emitter', the equipment has produced a 'gravity impulse', Mr Podkletnov says, "that is very short in time and propagates with great speed (practically instantaneously) along the line of discharge, passing through different objects without any observable loss of energy".
>
> The result, he maintains, is a repulsive action on any object the beam hits, that is proportional to its mass. When fitted to a laser pointing device, Mr Podkletnov says, his laboratory installation has already demonstrated its ability to knock over objects more than a kilometer away. The same installation, he maintains, could hit objects up to 200km away with the same power." (55)

These claims caught the attention of aerospace company Boeing which has been reported to be researching antigravity.

Whether antigravity will ultimately be proven to exist or not, one thing is already clear: mainstream physics is unwilling to investigate antigravity claims in good faith. Robert L. Park, the spokesman of the *American Physical Society* made a typical comment in his *What's New* column in 2002 that illustrates the unscientific "theory overrides evidence" modus operandi of the

physics establishment:

> Why would Boeing choose to spend millions to test a ridiculous claim by an obscure Russian physicist that has failed every test and is a physical impossibility to begin with? (56)

The reason that antigravity and gravity shielding are considered "physical impossibilities" is of course the dictate of general relativity that gravity is not an ordinary force, but an effect of curved space-time.

In dismissing the evidence for such phenomena, mainstream physics is engaging in circular reasoning rivaling that of fundamentalist theology: since no experiment has ever contradicted general relativity, general relativity must be true, and anti-gravity and gravity shielding effects cannot possibly be real, since they would contradict general relativity."

### The Second Law of Thermodynamics

The second law of thermodynamics, in simple language, says that in a closed physical system, useful energy decays into waste heat, and one can't win it back. A machine that produces, say, electrical energy from ambient heat is impossible according to the second law, and termed a "perpetuum mobile of the second kind".

But the second law is under siege, and it may turn out that this alleged rock-solid law of nature is only a reflection of the limitations of 19th and 20th century engineering.

In a paper titled *A Solid-State Maxwell Demon* (57) D.P. Sheehan and A.R. Putnam of the departments of Physics and J.H. Wright of the department of Mathematics and Computer science of the University of San Diego have proposed a semiconductor device that would generate useful energy from the thermal noise of an electronic circuit. The authors successfully tested their model on a commercial semiconductor simulator and estimate that the technology necessary to construct a laboratory model will be available by 2007. In their introduction, they write:

> Over the last ten years, an unprecedented number of challenges have been leveled against the absolute status of the second law of thermodynamics. During this period, roughly 40 papers have appeared in the general literature, representing more than a dozen distinct challenges; the publication rate is increasing. Recently, for the first time, a major scientific press has commissioned a monograph on the subject and a first international conference has been convened to examine these challenges.

One would think that given the implications (defeating the second "law" means nothing less than solving the human energy crisis permanently), governments, corporations and the scientific

establishment would be interested. But there is very little interest. The prevailing (circular) reasoning remains that machines that violate the second law are impossible because they would contradict the second law (58).

### Conclusions

There is widespread belief among physicists and non-physicists alike that physics has essentially understood the universe. According to this "end of science" belief (59), all that remains is to connect a few dots and to do some fine-tuning. But the evidence discussed here suggests that this satisfactory state of affairs is a mere illusion created by a failure of the self-correcting mechanisms of modern science. The current consensus view of physical reality which is based on relativity, quantum mechanics and big bang cosmology may turn out to be more social construct than eternal truth. An unbiased, honest reevaluation of this consensus in light of anomalous evidence is sorely needed, but it will require fundamental reform of the peer review and funding mechanisms of modern science.

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