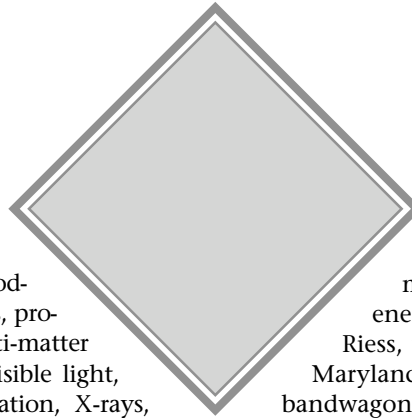


Tesla and the Aether

Eugene F. Mallove



It is the opinion of conventional science that the universe consists of just this: mass (embodied in particles such as electrons, protons, neutrons, and various anti-matter particles) and electromagnetic radiation (visible light, radio waves, ultraviolet and infrared radiation, X-rays, gamma rays, etc.). All of this “stuff” is embedded, as it were, in what is called a space-time plenum, which supposedly emerged into existence, from previous non-existence, in a fraction of a second of “cosmic time” (some 15 billion years ago in “cosmic time”—this just in on February 12, 2003 from the *New York Times*, “Confirmed”! 13.7 billion years $\pm$ 200 million years ago). For some reason, universal “cosmic time” is alright to talk about, as distinct from curved or flat “space-time,” which we mortals must be confined to, according to Einstein’s Special Relativity theory; we cannot have our Time and our Space separately, or so we are told; no one’s Time is the same Time as that of another, who is moving relative to him or her.

In conventional science, all the “stuff” of the universe fills a regime of cosmic *nothingness*, with quantum mechanical electromagnetic fluctuations at an extremely small sub-atomic level filling up this “nothingness”—the so-called zero-point energy. Virtual particles supposedly pop in and pop out of existence—unpredictably, chaotically, randomly—to satisfy or not satisfy mass-energy conservation. Recently more baggage has been added to this cosmic picture by conventional science: It feels a need to augment the universe with so far unidentified “dark matter,” “dark energy,” “quintessence,” and a seemingly interminable epicyclic bestiary of imagined creatures to help patch up the Big Bang with its primary structural feature, curved space-time, as dictated by General Relativity. This is Einstein’s theory that supposedly “explains” gravity, but which does no such thing. Then there are the string theorists and the extra-dimensional universe theorists, with all their mathematical gymnastics that aim at explaining this increasingly mud-died, quite ugly picture. Each of them longs to win that vaunted measure of nobility in science today, the Nobel Prize, for his or her contribution to the grand Theory of Everything.

An all-pervading “dark energy” is the latest Establishment darling, which is supposedly accelerating the imagined expansion of the universe. Said expansion is critically dependent on the measured cosmic red-shifts in light being truly of *cosmic* significance, not merely *local*-to-the-observed galaxy or quasar, *i.e.* of *new physics* significance—but that is another depressing story of the failures of Fizzix to consider possible

major cracks in its foundations. A seemingly endless parade of stories in the news media evidences this infatuation with “dark energy.” One MIT-trained physicist, Dr. Adam Riess, working at the Space Telescope Institute in Maryland five years ago, helped get the “dark energy” bandwagon going with his analysis of distant supernovae observations.

Add this unknown “dark energy” essence to the “stuff” that Modern Physics believes comprises existence—it’s supposed to constitute some 75% of the “weight” of the cosmos, writes Dennis Overbye in his *New York Times* profile of Riess, February 18, 2003. More adulation for Einstein comes from the new universe “accelerating expansion” explanation, writes Overbye: “The leading explanation, so far, Dr. Riess said, is Einstein and his old fudge factor, the cosmological constant. According to modern quantum theory, the emptiness of space foams with evanescent particles, and their energy should act as an anti-gravity.” (One recalls that this Einsteinian “fudge factor” was previously regarded as Albert’s “greatest blunder”!) New projects and money aplenty are now flowing as the dark energy feeding frenzy has taken off. One project is dubbed “Essence”—believe it or not. We have yet to hear of any of these space projects being designated, “Aether.” Too bad. Such a code name might prompt a return to bench-top experiments with Tesla coils (more on this later). Overbye quotes Riess in an embarrassing gaffe, the absurdity of which neither writer nor astrophysicist can comprehend (neither subscribes to *Infinite Energy*): “I would like what we find to be real, not spurious. The only thing I would really find disappointing is if at the end someone came along and said, ‘You guys really screwed up your measurements.’ I don’t want it to be like cold fusion. I want it to be a part of science that has to be weaved into the studies of supernovae.” Riess then recalls his memory of cold fusion, perhaps when he was at MIT: “Free energy for everybody.” But with cold fusion’s presumed demise, it became, he states, “a bizarre thing that had no place in science. I would hate that we become synonymous with cold fusion.” Riess opines that it is unlikely that dark energy will go that way.

We are far from the time of nineteenth century and early twentieth century Nikola Tesla, when experiment and the concrete technological device *based on experiment* was the ultimate arbiter of Truth. Today we live in establishment science’s world of Absolute Fiction. In this world, hundreds of experiments that show irrefutable evidence of nuclear reactions occurring at low-energy (LENR/“cold fusion”) can be dumped into the

trash bin of alleged scientific failure—to cite one example of many such trashings. When Tesla worked, another very serious component of the universe was very much a critical topic of discussion among physicists—the *ether* (or *aether*). This was the postulated finely structured substance that simply *had* to exist, if there was to be any hope of explaining how light waves were to travel through what otherwise would be just a vacuum of absolute “nothingness.” James Clerk Maxwell, who gave us the first version of the equations used in electromagnetic theory today, certainly believed in an aether—the *luminiferous*, static one that carried light. As he wrote in the Ninth Edition of *Encyclopedia Britannica* (which began appearing around 1875), “The only aether which has survived is that which was invented by Huygens to explain the propagation of light. The evidence for the existence of the luminiferous aether has accumulated as additional phenomena of light and other radiations have been discovered; and the properties of this medium, as deduced from the phenomena of light, have been found to be precisely those required to explain electromagnetic phenomena.” By the time of the 11th Edition of *Britannica* (1910), the aether was still alive and well—five pages of fine print and mathematics in Volume 1 discuss the concept and experimental questions about the aether in great detail, even the null interferometer result for the *static* aether, as obtained by A.A. Michelson in the 1880s. Active questioning about the possibility of a *dynamic* (moving) aether was at the fore in the 11th Edition. The article closed in a very upbeat way, promising that much new was yet to be discovered about the aether: “Finally, reference should be made to the phenomena of radioactivity, whether excited by the electric discharge in vacuum tubes, foreshadowed in part by Sir Wm. Crookes and G. G. Stokes, and later by A. Schuster and others, but first fully developed with astonishing results including the experimental discovery of the free electron by J.J. Thomson, or the correlated phenomena occurring spontaneously in radio-active bodies as discovered by H. Becquerel and by M. and Mme. Curie, and investigated by them and by E. Rutherford and others. These results constitute a far-reaching development of the modern or electrodynamic theory of the aether, of which the issue can hardly yet be foreseen.” Yes, even electricity, previously an unknown aetheric fluid, was becoming identified, in part, with the newly discovered electron. Matters of atomic transformation were just beginning to be divined. Had an electrochemist been around



J. J. Thomson

then with an accurate calorimeter, excess heat in ordinary water electrolysis in nickel/platinum systems might have been discovered at the turn of the century! And, it would then have been accepted, not attacked. The world of physics was open and in ferment. The right path could have been taken, but it was not.

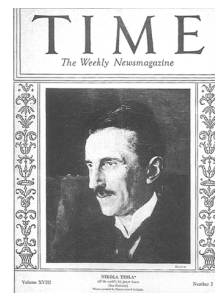
It is 2003, and establishment science long ago threw out any serious discussion of the aether and its measurement. This it did long before it trashed LENR. Who needed or now needs an aether, when one had “space-time,” multi-dimensions, vibrating strings—all wrapped up nicely in academic budgets? Who needs LENR—and spectral and calorimetric evidence that electron clouds around nuclei are not what standard QM says they are—when one has \$1.5 billion of newly minted DOE money for *hot* fusion?

But the ghost of the aether is back. The spirit of Nikola Tesla lives and there is much unfinished business at hand for

physics. A sane, experimentally-based cosmic view may yet be rescued from what masquerades as an increasingly “perfected” so-called Modern Physics. For me it was “cold fusion” that provided the wake up call. Cold fusion was like a canary brought into a deep mine to test its atmosphere. The canary died—proving conclusively that it was possible for late twentieth century establishment science to viciously attack anything, no matter how well-established experimentally, if the discovery did not seem to fit prevailing theories—and, indeed, cold fusion does *not* fit prevailing theories. And, if the *easy* transmutation phenomena associated with cold fusion/LENR (sans even direct electric energy input!) continues to be as prominent a feature as I think it will, the cold fusion canary will have served a further clarifying purpose: Present LENR theories, virtually all of them, which attempt to disconnect from more foundational questions about physics, such as the aether and potentially lethal challenges to quantum mechanics, are likely utterly doomed. Frankly, heroic and temporarily useful as were these lattice dynamics theories of Schwinger, Hagelestein, the Chubbs *et al.*, they are almost certainly doomed. To understand cold fusion/LENR—the “nuclear active environment” or “NAE” as investigator Dr. Edmund Storms terms it—we will most surely have to return to fundamental questions about electricity and the aether.

What did Tesla think about the aether? For that matter, what did Tesla think of “electricity”? We must remember that when the nineteenth century Tesla worked, the aether was inextricably connected with the concept of electricity—in addition to its being the medium of the transmission of light and other Hertzian electromagnetic waves. The idea of “particles of electricity”—later to be discovered and then called “electrons”—was not yet in vogue. Electricity was thought of as something like an intangible fluid—literally “etheric.” In a seminal talk before the American Institute of Electrical Engineers (AIEE) in May 1891 at what was then called Columbia College in New York City, Tesla spoke these telling words: “Of all the forms of nature’s immeasurable, all-pervading energy, which ever and ever change and move, like a soul animates an innate universe, electricity and magnetism are perhaps the most fascinating. . . We know that electricity acts like an incompressible fluid; that there must be a constant quantity of it in nature; that it can neither be produced or destroyed. . . and that electricity and ether phenomena are identical.”¹ Tesla noted that this “ether” was everywhere moving and dynamic. The use of the ether would be the salvation of humankind, he said: “. . . with the power derived from it, with every form of energy obtained without effort, from stores forever inexhaustible, humanity will advance with giant strides.” He said, “. . . it is a mere question of time when men will succeed in attaching their machinery to the very wheelwork of nature.”

Of course, in Tesla’s lifetime the wheelwork of nature—the ether/aether—was not harnessed. It was to become very much out of style to be talking about an aether—any kind of aether, static or dynamic. The advent of Albert Einstein’s relativity theory had begun to abolish the aether from the physicists vocabulary in the 1920s and 1930s. Yet when *Time* magazine put Tesla on its cover in celebrating his 75th birthday (July 10, 1931), it referred to Tesla’s



work toward harnessing an “entirely new and unsuspected [energy] source.” Was this from the aether? Perhaps.

Tesla had long hoped to be able to distribute electric power globally through the medium of the aether, power generated at the transmission point with benign and unlimited sources such as hydroelectric power. The power would be consumed only as needed at millions of receivers, being carried to each within the resonating cavity surrounding the body of the Earth. Such power would be transmitted not by “electromagnetic radiation,” as we ordinarily think of it (oscillating electric and magnetic waves *transverse* to the direction of propagation), but by *longitudinal* waves, which were more akin to longitudinal pressure waves in the air—the propagation of sound. He had conducted many experiments that seemed to show that such non-electromagnetic power propagation was possible. Indeed, Tesla illuminated electric bulbs at good distances. But was this really a new form of energy propagation? Indeed, it seems to have been.

We should first consider Nikola Tesla’s special induction coils, which are called “Tesla Coils” these days. There they sit in dusty physical science class supply cabinets. They are sold by Edmund Scientific and other companies as classroom demonstrations of arcs and sparks. Supposedly the only thing circulating in these coils or out of them is all that modern physics knows about or expects to be there—*electrons* for the “electricity” that can be in the wires of the coils, and “electromagnetic radiation” that can emanate from these coils. There can be no such thing as “*longitudinal waves*” emanating from such coils—everyone *knows* that electromagnetic radiation is a *transverse* wave (from side-to-side perpendicular to the direction of propagation) electric and magnetic phenomenon in the nothingness of space-time, right? Well, let us see. . .

For a long time, good experimenters have been puzzled about the workings of Tesla coils. Many articles about these coils and related matters have appeared in the excellent publication, *Electric Spacecraft Journal*.² But that is only a beginning, and from the constraining physics of considering these coils to be exclusively electromagnetic field radiators with an electrostatic component. It seems, however, that Tesla coils are rich, indeed, with clues to the very structure of a dynamic aether. My own experience with matters aetheric did not begin with Tesla coils. It started with the puzzling and dramatic claims for excess electric power generation in Pulsed Abnormal Glow Discharge (PAGDTM) tubes of Dr. Paulo and Alexandra Correa, which were profiled in Issues #7, 8, and 9 of *Infinite Energy* back in 1996. These are high vacuum glass tubes, typically with aluminum cathodes and anodes, which self-oscillate in a particular *negative resistance* region of current and voltage. That patented technology indeed has a significant over-unity characteristic (approximately 10/1 power ratio, according to my own observations made in the Correa laboratory much later in 2000-2002), of the type that has been generically associated by “free energy” researchers with zero point energy (“ZPE”) extraction. Indeed, that type of quantum-mechanical “aether” is about as far as most speculators about free energy are willing to go. This follows from a lingering need to hold onto something perceived to be semi-respectable and citeable from twentieth century physics. That is a good first approximation, but it is evidently not the full picture—and it may well be far from it.

After PAGD, I learned that the Correas in parallel had begun to make more fundamental thermal and electroscop-

ic measurements of what they had begun to infer from the work of Wilhelm Reich (1897-1957) was a dynamic, non-luminiferous (non-electromagnetic) aether. One of the centerpieces of this work apparently has allowed further detailed physics and mathematical understanding of what Tesla could only dimly perceive with his special high-frequency coils.^{3,4,5} If this experimental work, closely coupled with theory, is ultimately successful in recovering a new *laboratory-testable* recognized physics in the realm of electricity and magnetism, it will owe its foundations to that mostly unsung genius, Nikola Tesla.

In an elaborate series of experiments with Tesla coils,³ employing a host of different thermal and electric sensing apparatus (mercury thermometers, electroscopes, GM counters, oscilloscopes, neon bulb indicators within circuitry, Faraday cages, and plate antennas) at different ranges from the coil tips, and using comparison energy sources (various ion generators and radioactive sources), the Correas were able to rule out what Tesla coil radiation is *not*, and to synthesize what it may well be. They conclude that Tesla coils emit a special form of massfree radiation that is not electromagnetic in character and not sourced in ionic emissions. They observed that these “Tesla waves alone were capable of triggering the ratemeter via the plate antenna even at substantial distances.” They suggest that the pulsed input to the primary of the Tesla coil “induces in the space of the closely coupled secondary a conversion of the local aether energy to electric form.” They write, “All happens as if these coils synthesized two different kinds of electric fields, one proximal [near the coil] and massbound, and the other massfree and responsible for all distal [distant from the coil] effects.”

At root, these experiments touch on the deep issue of the aether and its relation to what are evidently two basic forms of electricity, the *accepted* form (massbound, the flow of electrons), and other *not accepted* at all by conventional science, massfree—capable of flowing in and around wires, as well as being transmitted as Tesla waves through gas media and vacuum. The massfree form of electricity might be called “cold electricity.” This hearkens back to another fundamental issue, the very nature of some non-standard biological energies, which are also presumed not to exist and the subject of much mockery these day.

When tracing back the origins of twentieth century conceptions of organisms as purely biochemical systems, with nerve cell electric depolarization as the exclusive explanation for non-chemical, long-range signaling through an organism, one comes to the argument about “vitalism” or “animal electricity” that originated in the scientific controversy between L. Galvani and A. Volta in the late eighteenth century. It turns out that much was lost in the marginalizing of Galvani’s “animal electricity” ideas of unipolar (single wire) electric flow by the ascendant bi-polar battery conceptions posed by Volta, which dominate our understanding of electricity today. Some of this debate is beginning to be resurrected and clarified in various new scientific investigations of acupuncture, as an example, using modern medical imaging tools.⁶ In the cited study, published in the *Proceedings of the U.S. National Academy of Science* (after its blatant rejection, without review, by mainstream science journals), it is conclusively shown with scientifically blinded examination using ultrasonic and other stimulation of an acupuncture point in the foot of a subject (many subjects were used): 1) The acupuncture point on the foot, known

by acupuncturists to help vision when stimulated, resulted in nearly instantaneous production of activation in the visual cortex of the brain of the subject—a completely reproducible effect that could be toggled off and on; 2) The acupuncture point was found to be highly localized (within a fraction of a millimeter); and 3) The speed of transmission of the information from the foot acupuncture point to the visual cortex of the brain, as measured by fMRI, was at least 1,000 times any known nerve transmission speed. Dr. Joie P. Jones explained, at a public lecture in June 2001 (Society for Scientific Exploration Meeting, LaJolla, California), that because the functional MRI (fMRI) minimum time localization of measurement is about 80-microseconds, the actual transmission speed to the brain might be faster than even this astounding 1,000-fold figure. We shall explore more about these biological energies in future issues of *Infinite Energy*.

For now, an excellent introduction to some of the fundamental issues of bio-energies is provided in the Correa monograph, "Fundamental Measurement of Biological Energies I" (S2-28). They state in that monograph's description of Galvani's seminal experiment with twitching frog legs, "What Galvani had created was an antenna tuned to receive ambipolar electric radiation caused by sparks, and tuned therefore to receive a form of electricity which is indeed different from ordinary massbound electricity, because it is both massless and—phenomenologically—electrically neutral. Galvani had just discovered the existence of Tesla radiation, before Tesla." The historical disaster that has occurred becomes increasingly evident: "What has happened here to Galvani's experiments is exactly what happened a century later, under J.J. Thomson's lead, to Tesla's own discovery of ambipolar electric, longitudinal radiation—it too became reduced to electromagnetism."

It is noteworthy that Tesla was very interested in the electrical component of life-energy, as was that other aether theorist, Lord Kelvin; the two had actually met. Thus, we owe a lot to Tesla, the "Man Out of Time," not only for the technology that runs our world today, but also the future energy sources that will abolish the Hydrocarbon Fuel Age, and for the future biomedicine that will seamlessly integrate Occidental medicine with the wisdom of the East. But first, somehow sanity will have to be restored to science on both the physics and biological frontiers. This will be impossible, one fears, without an intense focus on the basics of a restored aether physics. Fortunately, as Tesla, Reich, and now the Correias show, these matters can be adjudicated in laboratory experiment, even as the essentially psychotic scientific establishment—ignorant of the facts of its own history, and only too willing to insult some of its greatest benefactors—ignores it all.

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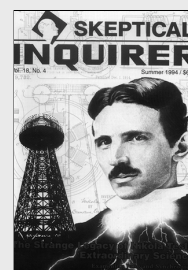
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Tesla and the Science Cops

Eugene Mallove

There is nothing better that the science police at CSICOP ("the science cops"—"Committee for the Scientific Investigation of the Claims of the Paranormal") love to hate than what they can only dimly understand. It is therefore not surprising that CSICOP, based in wintry Buffalo, New York (ironically the first city to be electrified by Tesla's technology), would at some point have attacked Nikola Tesla. Sure enough, on our dusty library shelves we find an edition of CSICOP's *Skeptical Inquirer* journal, which devotes its Summer 1994 cover to mockery of Tesla—"The Strange Legacy of Nikola Tesla: 'Extraordinary Science.'"



Author Jeff Johnson—identified as "an electrical engineer and a member of the board of the Rocky Mountain Skeptics"—thinly disguises his brand of Tesla mockery by poking fun at some of the happenings at a meeting in Colorado Springs of what was then the International Tesla Society. He describes this as a gathering of *egotistical* pseudoscientists who were (quoting CSICOP guru Martin Gardner) "motivated by a belief in their own greatness, unrecognized by the world." Johnson claims that in "ordinary" science, "ideas gain stature as unsuccessful attempts to discredit them are made." *Au contraire*, Mr. Johnson, in ordinary science (meaning, Establishment science), no idea that contradicts sacred writ of present textbooks is allowed to have *any* chance to being properly considered—*no matter how unsuccessful the experimental attempts to discredit it are*. New fundamental ideas, such as LENR/cold fusion, are *prima facie* dead on arrival and also thereafter, no matter what proof is offered. It's might makes right all the way.

Johnson can be more direct too. He states that Tesla "later in life was able to indulge in a panoply of bizarre and grandiose ideas; and he achieved considerable scientific notoriety, despite a flawed understanding of physics and other sciences." Note the implied know-it-allness of Mr. Johnson—if *he* were around, boy could he have taught Tesla a thing or two about physics! Moving on to praise Edison's industrial lab style, in contrast to that of Tesla, Johnson writes that "technological development today is too expensive and too complex for any single person to understand it all." Indeed, that misconception about gigantism is why today we have hot fusion and not cold fusion funded officially. It is also why billions of dollars are spent on high energy physics, when simple table-top experiments launched by Tesla can convincingly show that the foundations of such physics are as weak as mud. The arrogant Johnson continues, "A mediocre artist may acquire an exaggerated reputation by dying just before the onset of a dark age, and something similar seems to have happened to Tesla's reputation among unsung geniuses today." Bah!