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Subject: AGU Task Force on Scientific Ethics and Integrity
Importance: High

To: American Geophysical Union (AGU) Executive Director Christine McEntee and members of the AGU Task Force on Scientific Ethics and Integrity

From: J. Marvin Herndon, AGU Member Number 10195343

Individuals, who collectively engage in defining and setting standards for scientific ethics and integrity, from my experience, generally are either quite naïve or are themselves science-barbarians who would not wish for their behavior to be restricted. I am neither. So, here I endeavor to provide the background that the AGU Executive Director and this Task Force should have. Specifically, I provide a fundamental statement of scientific ethics and integrity, and I provide examples of the wide-spread absence of scientific ethics and integrity within the geophysics community.

Fundamental Statement of Scientific Ethics and Integrity

The purpose of science is to discover the true nature of the Earth and Universe and all contained therein, and to share that knowledge truthfully with people everywhere. Science is about understanding and it is about truth. The progress of science involves replacing less precise understanding with more precise understanding. Thus, one may arrive at a fundamental statement of scientific ethics and integrity: **Scientists are persons of integrity: They stand for what is right. They tell the truth and ensure that the full truth be known. They do not lie.**

Departures from the above ‘statement of scientific ethics and integrity’ cover a broad spectrum of activities that in my experience are common practice among AGU members and in instances within the AGU as an organization. Said departures include, but are not limited to: (1) Misrepresenting the current state of scientific knowledge to U. S. Government officials, to the scientific community, and to the public; (2) Engaging in activities that unwarrantedly suppress publication of important scientific contradictions to extant work; (3) Engaging in systematic failure to cite important scientific contradictions to extant work; (4) Engaging in activities and/or actions that instill fear of adverse consequences which coerce others to engage in said departures, and; (5) Engaging in systematic exclusionary activities, such as blacklisting competent scientists.

The consequences of said departures from the above ‘statement of scientific ethics and integrity’ may potentially subject individual perpetrators and officers of sponsoring organizations to Federal Grand Jury criminal indictments, and may potentially subject sponsoring organizations to debarment from Federal grants and contracts, and loss of their Federal tax exempt status. Why? One reason is this: Most of the support for American science comes from the taxes that hard working Americans pay to the U. S. Government. The actions of the science-barbarians have already caused countless millions of tax-payer dollars to be wasted on totally fruitless endeavors, under the guise of science, and countless more millions surely to be wasted in the near future, all the while driving America toward third world status in science and in science education.

Lying to the U. S. Government, Lying to the Scientific Community and Lying to the Public

In 1936 Inge Lehmann discovered at Earth’s center, the inner core, a solid object slightly smaller than the Moon and about three times as massive. In 1940, the idea began that the inner core is solid iron metal in the process of solidifying from the fluid iron-alloy core, like an ice cube in a freezing glass of water. In 1949, Elsasser and Isenberg published a different idea, namely, that the inner core was the result of a pressure-induced transition

in iron. Over the next 27 years this idea was discussed and cited in the scientific literature. In 1976, Bukowinski and Knopoff refuted that idea, showing that pressures within the Earth were not sufficiently great for that to be the case. I mention this example because it shows the way science should progress: When a contradiction to an important concept arises in science, the contradiction should be discussed and debated, efforts should be made to refute or to confirm the concept, and the idea should be cited in the scientific literature; the alternative is lying to the U. S. Government, lying to the scientific community, and lying to the public.

Since about 1940, Earth's interior of was thought to resemble a common ordinary chondrite meteorite. In the mid-1970s, I studied the rare enstatite chondrites that had been greatly ignored and realized a different possibility for the composition of the Earth's inner core. My paper on the nickel silicide inner core, communicated to the *Proceedings of the Royal Society of London* by Nobel Laureate Harold C. Urey, published in 1979 [1]; my 1980 paper in the same journal demonstrated for the first time that, if Earth resembles a chondrite meteorite as widely believed for good reasons, it resembles an enstatite chondrite, not an ordinary chondrite [2]. [See Exhibit AGU1, especially Table 2]. But in this case, there was no debate or discussion; for three decades members of the geophysics community deliberately and selectively ignored those important contradictions, and in doing so deceived U. S. Government officials, the scientific community, and the public. Deliberate? See Exhibit AGU2 which among other things describes Former AGU Executive Director Fred Spilhaus' suppression based upon misrepresentation of Christopher N. Herndon's manuscript.

For three decades, geoscientists have been attempting to describe the interior of Earth as if Earth resembles an ordinary chondrite meteorite, which it does not. That is like trying to navigate to a series of street addresses in Chicago using a New York City map. For three decades, while my published advances were selectively ignored, the geophysics community wasted countless millions of dollars on fruitless endeavors, such high pressure studies of iron metal, a plethora of fruitless investigations about the nature of the matter at the core-mantle boundary, and the making of models based upon arbitrary assumptions. Moreover, a

few individuals, such as Lodders [3] and Javoy [4, 5] attempted to claim credit for ‘discovering’ that Earth is like an enstatite chondrite without ever citing my prior work.

If in 1979 the geophysics community had performed with integrity and greeted with discussion and debate my new concept of the Earth’s inner core being comprised of nickel silicide instead of iron metal, others might have had the opportunity to make major discoveries; instead those discoveries were left for me. One of the consequences of Earth resembling an enstatite chondrite is that a major proportion of our planet’s uranium occurs within the core. I published the feasibility of a nuclear fission reactor at the center of Earth as the energy source for the geomagnetic field in 1992 in the *Journal of Geomagnetism and Geoelectricity* [6], in 1994 in the *Proceedings of the Royal Society of London* [7], and in 1996 in the *Proceedings of the National Academy of Sciences (USA)* [8]. Exhibit AGU2 describes AGU efforts at suppressing mention of planetary nuclear fission reactors; the third AGU president to come along, John Knauss, had the integrity and courage to stand up to Spilhaus, the result being that my *Eos* [9] paper on planetary nuclear fission was published in 1998.

For thirty years, Oak Ridge National Laboratory has developed and validated software to simulate the operation of nuclear reactors. Dan Hollenbach modified the software so as to be able to simulate the operation of a nuclear reactor at the center of Earth, now called the georeactor. In 2000, we submitted the results of those calculations to the *Geophysical Journal International*. We sent it to a French editor, Jean Francheteau because France has a strong nuclear reactor community. Weeks passed with no response; our emails and phone message just yielded silence. We contacted the journal headquarters in London and found that Francheteau had never logged-in the paper. Under pressure from the journal, Francheteau obtained some shabby, negative reviews, none from French nuclear scientists, and rejected the paper. The paper was subsequently published in 2001 in the *Proceedings of the National Academy of Sciences (USA)* [10].

Since the 1960s, helium has been observed in oceanic basalts with helium-3 to helium-4 ratios greater than those observed in air. The Oak Ridge results showed that the georeactor would produce helium in precisely the range of ratios observed in oceanic basalts [see Figure 8 of Exhibit AGU1]. In 2002, Hatten S.Yoder, Jr. communicated to the *Proceedings of the National Academy of Sciences (USA)* my paper showing more precise helium ratios. Exhibit AGU3 describes the failed attempt at suppressing that PNAS submission made by Don Anderson and three other members of the National Academy of Sciences; the paper published in 2003 when the deception was exposed [11].

For nearly three decades before the Oak Ridge helium ratios discovery, the helium-3 exiting Earth was ascribed to being primordial helium trapped since Earth's beginning, which gave rise to a plethora of papers on mantle de-gassing. After publication of the Oak Ridge helium results, papers related to mantle de-gassing systematically failed to cite that important contradiction, for example, the one by Timothy L. Grove and colleagues [12] even though I had direct communications with and sent copies of the relevant papers [10, 11] to one of the authors.

In 2003, the French magazine *Science & Vie* published an article about my georeactor concept; for fact-checking the writer copied me on comments made by Francis Albarède that were to be included in the article. On my behalf, a French-speaking Canadian nuclear engineer, Jaroslav Franta, advised Albarède in French of significant technical errors in his remarks. Albarède, however, let his misrepresentations stand.

In 2004, in an article in the *San Francisco Chronicle*, David J. Stevenson deceived the readership about my work, but was caught by an astute reader [13].

As early as 1930, it seemed that energy appeared to be mysteriously disappearing during the process of radioactive beta decay. The energy account sheet simply did not balance. To preserve the idea that energy is neither created nor destroyed, "invisible" particles were postulated to be the agents responsible for carrying energy away unseen. Finally, in 1956 these

"invisible" antineutrinos were detected experimentally. Subsequent detection of neutrinos from the Sun and from a supernova, and the detection of antineutrinos from nuclear fission reactors, coupled with observations of their apparent changing from one form to another has made the whole subject a really "hot" research area in physics. It is not surprising then that R. S. Raghavan, a neutrino expert at Bell Laboratories, after learning about the georeactor as a consequence of the lunch-time seminar at Bell Laboratories, would author a paper, entitled "Detecting a Nuclear Fission Reactor at the Center of the Earth" [14].

As early as the 1960s, there was discussion of antineutrinos being produced during the decay of uranium and thorium in the Earth. In 1998, Raghavan was instrumental in demonstrating the feasibility of their detection [15]. Now, Raghavan's paper on detecting a deep-Earth nuclear fission reactor [14], posted on the Internet physics archive, arXiv.org, stimulated intense interest worldwide, with groups in Japan, Italy, and Russia figuring prominently in the early appreciation georeactor-produced antineutrino detection. Russian scientists expressed well the importance: "Herndon's idea about georeactor located at the center of the Earth, if validated, will open a new era in planetary physics" [16].

For a brief time, it looked as if science was beginning to function as it should, with openness to new ideas, with debate and discussion, and with efforts being made to attempt validation. Then along came the science-barbarians. A scientist in Europe told me that Raghavan had told him that his paper on georeactor detection by antineutrinos had been rejected by two journals, *Physical Review Letters* and another, because – I am paraphrasing here – one or more secret reviewers objected to my georeactor concept. To the European, the implied warning was clear: Cite Herndon's work and your own papers might not get published.

Misrepresentation abounded. In a 2008 front-page *Eos* article, entitled "Geoneutrino Measurements and Models Investigate Deep Earth" [17], Stephen T. Dye, William F. McDonough and John Mahoney, rather than citing any of my primary georeactor publications, cited instead published copy-cat georeactors at the core-mantle boundary and atop the inner core

that ignored the “China Syndrome”, *i.e.*, they would suffer melt-down, ending up at the center of the Earth, the site of my georeactor.

Antineutrinos can fly through the Earth virtually unimpeded. Although vast numbers of antineutrinos can be produced, very, very few can be detected. Detection is the major challenge; huge, extremely sensitive detectors are required. In the area of antineutrino detection, the U. S. – Japan consortium, referred to by the acronym KamLAND, is technologically well ahead of the others.

In July 2005, in a paper published in *Nature*, the KamLAND consortium reported the first detection of antineutrinos originating from within the Earth [18]. But what the paper said and what it should have said are two entirely different things. In easy to understand terms, this is what the paper should have said: In just over two years of taking data, a total of 152 ‘detector events’ were recorded. After subtracting for the background from commercial nuclear reactors and making corrections for contamination, only 20-25 ‘detector events’ were considered to be from antineutrinos originating within the Earth. Within the limitations of the experiment, it is absolutely impossible to ascertain the proportion of those that may have resulted from the radioactive decay of uranium and thorium, or may have been produced from a nuclear fission georeactor at the center of the Earth. Instead, what the 87 authors of the KamLAND consortium did was to mislead the scientific community and the public by wholly and intentionally ignoring the possibility of georeactor-produced antineutrinos. Raghavan’s 1998 paper on measuring the global radioactivity in the Earth was cited [15], but not his 2002 paper "Detecting a Nuclear Fission Reactor at the Center of the Earth" [14]. And, there was absolutely no reference to any georeactor paper.

The KamLAND misrepresentation was undergirded by yet another misrepresentation in a "News and Views" companion article in the same issue by William F. McDonough [19] that discussed radioactive decay heat production in the Earth, noting: "The remaining heat must come from other potential contributors, such as core segregation, inner-core crystallization, accretion energy or extinct radionuclides – for example the gravitational

energy gained by metal accumulating at the center of the Earth, which is converted to thermal energy, and the energy added by impacts during the Earth's initial growth." Absolutely no mention was made of georeactor-produced heat, which is on a firmer scientific foundation than the "other potential contributors" mentioned.

In 2010, the Italian group reported detection of antineutrinos from within the Earth [20]; in 2011 the kamLAND collaboration did as well [21]. They noted, respectively, that as much as 15% or 26% of the energy output of Earth's uranium and thorium may be attributed to georeactor nuclear fission, and they cited my publications. On July 13, 2011, following that kamLAND report, I and a few others received an email from Bertram Schwartzchild expressing interest in writing a story for *Physics Today* on the kamLAND report and asking for counsel. On August 4, 2011, Schwartzchild sent his draft of the story which cited an unpublished preprint of mine and contained the following blatant misrepresentation: "…the KamLAND and Borexino data disfavor speculations that a local uranium concentration somewhere in the solid inner core might be functioning as a natural fission reactor". I complained about the misrepresentation and said that it would be more appropriate to cite my published papers. So, how did the *Physics Today* story finally appear? It read "There are speculations … The new data place an upper limit of 3 TW on the power of such a putative reactor" and it cited only my unpublished preprint.

Schwartzchild devoted three paragraphs to describing in favorable terms an Earth model that has as its basis only assumptions, but he refers to my work as "speculations". I demonstrated feasibility of a nuclear fission reactor at the center of the Earth applying in part the same calculations used in the design of commercial nuclear fission reactors, and demonstrated with the Oak Ridge calculations that the georeactor could operate over the lifetime of planet Earth at an energy level appropriate for production of the geomagnetic field, and that evidence for it exists, *viz*., by the production of helium isotopes in the same ratio range as observed in oceanic basalts, and its existence was confirmed, or at least not refuted, by the very geo-neutrino data Schwartzchild wrote his story about. So why did he misrepresent and impugn my accomplishments and my reputation?

Lying to the National Aeronautics and Space Administration

In the late 1960s, astronomers discovered that Jupiter, and later, that Saturn and Neptune each radiate into space about twice as much energy as each receives from the Sun. For two decades, NASA investigators were unable discover the nature of the internal energy source in a logical and causally related way. In 1992, I published in *Naturwissenschaften* my calculations demonstrating the feasibility of planet-centered nuclear fission reactors as energy sources for the giant planets [22]. The following year, I began a series of publications on the existence of a nuclear fission reactor at the center of the Earth, first an energy source for the geomagnetic field [6-8, 10, 11], and second as both the energy source and production mechanism for the geomagnetic field [23, 24]. I generalized the concept to explain magnetic field production in other planets and large moons, including planet Mercury [25]. Moreover, I showed that only three processes need have been operant to account for the formation of all of the matter circling the Sun [23], including planet Mercury. From whole-rock major element ratios in chondrites, I discovered a relationship that admits the possibility that ordinary chondrites were derived from a mixture of two components, one similar to a C1 chondrite, the other, perhaps the matter stripped from Mercury's protoplanet which led to Mercury's disproportionately large core [23, 26].

For the past twenty years, NASA-supported scientists, to my knowledge, have never mentioned natural planetary nuclear fission reactors or cited my publications. But they have discussed numerous observations where they should have, instances of 'mysterious' internal heat production and magnetic field generation, such as: (1) Internal heat generation in Jupiter, Saturn and Neptune; (2) Our Moon having a soft or molten core; (3) Mercury having a magnetic field; (4) Mars displaying evidence of an ancient magnetic field; (5) Our Moon displaying evidence of an ancient magnetic field; (6) Jupiter's moon Io displaying evidence of greater internal heat than can be accounted for by tidal interaction; (7) Jupiter's moon Ganymede having an internally generated magnetic field; (8) Saturn's moon Enceladus showing evidence of internal heating; and (9) Evidence of internal heat generation in Pluto's moon Charon.

In the September 30, 2011 issue of *Science* none of my work bearing on the origin of planet Mercury or on the origin Mercury's magnetic field by a planetocentric nuclear fission reactor was cited by the MESSENGER team, although it should have been; Sean C. Solomon, as Project MESSENGER Principal Investigator and author, is responsible for misleading NASA officials, the scientific community and the public.

Even More Serious Deception in the Future?

Exhibit AGU4, an article entitled "Corruption of Science in America" describes, among other things, the blatant, unwarranted suppression of a paper I submitted to *Physical Review Letters* which demonstrates that convection is physically impossible in the Earth's core and that the Rayleigh Number has been inappropriately applied. What that article does not say is that I first submitted the manuscript to AGU's *Geophysical Research Letters* and it was rejected without review!

As described with references in Exhibit AGU1, I have shown that convection in the Earth's core is physically impossible. What that means is that, if the Earth's magnetic field is produced by a convection-driven dynamo mechanism, as widely believed, the geomagnetic field is not generated within the Earth's fluid core. I have suggested instead that the geomagnetic field is generated in the radioactive waste sub-shell of the georeactor, where sustained convection is possible [24]. So what is to be the future? Acknowledge my work or continue to deceive U. S. Government officials, the scientific community, and the public? The opportunities for deceit become increasingly greater with each discovery I make.

As described with references in Exhibit AGU1, I have shown that convection in the Earth's mantle is physically impossible, which pulls the underpinning from beneath plate tectonics which critically depends upon mantle convection. I described a different geodynamic theory that explains, in a logical and causally related way, the myriad observations attributed to plate tectonics without requiring mantle convection. In this instance a broad area of geophysics is impacted; some long-held ideas become untenable or restricted. For example, magnetic paleolatitude determinations may be

subject to large errors [27]; magnetic paleopole calculations are invalid; fold-mountain formation does not necessarily imply continent collision [28]; and more. So what is to be the future? Acknowledge my work or continue to deceive U. S. Government officials, the scientific community, and the public?

An easy to understand overview of this new indivisible geoscience paradigm can be found as a recently published eBook, edited by Lynn Margulis; Exhibit AGU5 is the Preface.

http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Daps&field-keywords=indivisible+earth

http://www.barnesandnoble.com/s/indivisible-earth?keyword=indivisible+earth&store=allproducts

Summary

The examples above have one commonality: They are lies, lies to the U. S. Government, lies to the scientific community, and lies to the public. Said lies, I allege, in instances become matters of criminal activity, especially as relates to defrauding the U. S. Government and violating Federal anti-trust laws. The examples above are neither an exhaustive recitation, nor are they solely the actions of errant individuals. I have evidentiary documentation of instances wherein institution officials, when made aware said misrepresentations, sanctioned said behavior. But make no mistake; the net effect is to cheat the U. S. Government and to cheat themselves and other scientists. Science is all about the truth.

In my view, there is only one fundamental statement of scientific ethics and integrity: **Scientists are persons of integrity: They stand for what is right. They tell the truth and ensure that the full truth be known. They do not lie.** Any statement short of that becomes a statement as to which lies are permitted.

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