



## What's Wrong with this Picture?

**J. Marvin Herndon, Ph.D.** Transdyne Corporation, San Diego, CA 92131 USA

## ABSTRACT

A recent publication in *Nature* unintentionally disclosed major problems in the physical science community, existing for more than four decades that pose potential weaknesses as a basis for future technologies. The science of today, the basis for tomorrow's technology, could benefit in a major way, simply by asking the question *"What's wrong with this picture?"* 

The title, a catch-phrase from the 1980s, found frequent usage, for example in the movie *Terminator*. However, that catch-phrase is also one key element for making important scientific discoveries [1].

Recently, He et al. [2] published an article in *Nature* entitled "Superionic iron alloys and their seismic velocities in the Earth's inner core." By way of introduction, the authors cite several unresolved observations pertaining to the inner core since its discovery by Lehmann [3] in 1936 and Birch's 1940 [4] proclamation that it consists of partially crystalized iron metal. In the face of such unresolved observations, the authors [5-10] should have asked: "*What's wrong with this picture?*" Had they done so they might have realized a problem. Many researchers ca. 1940 thought the Earth resembles an ordinary chondrite meteorite [11]. In an ordinary chondrite, iron and nickel are always alloyed, and elements heavier than nickel even taken together could not comprise a mass as great as the inner core. Birch's rationale of the inner core being partially crystalized iron, however, might have been no longer valid as subsequent discoveries in the 1960s admitted a different possibility.

In the 1970s, while investigating enstatite chondrite meteorites, I realized that if the Earth's core originally contained silicon, an inner core of precipitated nickel silicide would be expected. The entire abstract of my publication on that possibility states [12]: *From observations of nature the suggestion is made that the inner core of the Earth consists not of nickel-iron metal but of nickel silicide*.

In the first article cited by He et al. [2], Birch [11] provides a lengthy discussion of the importance of meteorites and laments on the difficulty of determining which of the many diverse meteorites are a match for Earth's composition. I discovered how to circumvent that difficulty by relating mineralogically determined parts of meteorites to seismologically determined parts of the Earth by mass ratios (Table 1 from [13]).

Table 1. Fundamental mass ratio comparison between the endo-Earth (lower mantle plus core) and the Abee enstatite chondrite. Above a depth of 600 km seismic data [14] indicate data layers suggestive of veneer, possibly formed by the late addition of more oxidized chondritic and cometary matter, whose compositions cannot be specified at this time

Fundamental Earth Ratio	Earth Ratio Value	Abee Ratio Value
lower mantle mass to total core mass	1.49	1.43
inner core mass to total core mass	0.052	theoretical 0.052 if Ni₃Si 0.057 if Ni₂Si
inner core mass to lower mantle + total core mass	0.021	0.021
D" mass to total core mass	0.09*	0.11**
ULVZ† of D'' CaS mass to total core mass	0.012****	0.012**

\*Calculated assuming average thickness of 200 km. \*\* = avg. of Abee, Indarch, and Adhi-Kot enstatite chondrites. D'' is the "seismically rough" region between the fluid core and lower mantle. ULVZ \*\*\* is the "Ultra Low Velocity Zone" of D''. \*\*\*\*Calculated assuming average thickness of 28 km. Data from references [15-17]

About He et al. [2], ask again: "*What's wrong with this picture?*" Their Fig. 4 caption states in part "*outer-core convection generating the geomagnetic field*," a concept originated in 1939 by Elsasser [18]. But there is a problem. Convection in the fluid core is physically impossible for two reasons [13, 19]. First, due to compression from the weight above, the bottom of the fluid core is 23% denser than the core-top. The small decrease in core-bottom density from thermal expansion (< 1%) is insufficient to make the core top-heavy as required for convection [20]. Second, for sustained convection, heat brought to the core-top must be quickly removed, a physical impossibility as the core is surrounded by an insulating silicate blanket, the mantle, that has significantly lower thermal conductivity, lower heat capacity, and greater viscosity than the Earth's core.

The problem is not just He et al. [2], but generally a large portion of the physical science community with their mistaken ideas about consensus conformity and their failure to cite and to investigate contradictions. More than forty years ago, when I published the nickel silicide inner core idea [12], the geoscience community might have benefited greatly had they only asked the question: "*What's wrong with this picture?*" I did, frequently, and it led to numerous new concepts and discoveries, including:

• Solar System formation primarily according to the protoplanetary theory, minimally by the planetesimal theory [21, 22]

- Stored energy of protoplanetary compression as the primary energy driving geodynamics [22-24]
- Nuclear fission georeactor at Earth's center [25-30]
- Terracentric nuclear fission energy as the secondary energy driving geodynamics [23, 24, 29]
- Basis of heat transport within the Earth [13, 22, 31]
- Earth's magnetic field powered and produced by the Terracentric nuclear fission georeactor [29, 32]
- Whole-Earth Decompression Dynamics, the fundamental basis of geodynamics and geology [23, 33], not requiring physically impossible mantle convection [13], including
  - New concept for the origin of mountains characterized by folding [34]
  - New concept for the origin of fjords and submarine canyons [35]
- Georeactor origin of deep-Earth helium-3 [28]
- Planetocentric nuclear reactors as the basis for magnetic field generation in planets and large moons [36, 37]
- Aerosol particulate pollution, not carbon dioxide, as the main cause of global warming [38-43]
- New explanation for the near-side/far-side lunar maria disparity [44]

During the first half of the 20<sup>th</sup> century, there was debate and discussion. Scientists challenged new ideas that led to further new ideas and discoveries, which provided a basis for today's technology. But what about the scientific basis for tomorrow's technology? The science of today could benefit in a major way, simply by asking the question "*What's wrong with this picture?*"

I submitted the manuscript as written above to *Nature*. *Nature*, the most read scientific publication, rejected the article in less than 24 hours without peer-review. What does this say about the state of science and science publication? Maybe time to clean house?

As a graduate student, I published in *Nature*. Since then, I have submitted quite a few paradigm shifting manuscripts to *Nature*, but all were rejected, usually without benefit of peer-review. Some might wonder whether potential benefits accrue for government-funded scientists and science-publishers to act as a cartel, ignoring potentially paradigm shifting advances while 'beating a dead horse'.

For a time years ago, I consulted with an organization that had a joint venture with the owner of a gold mine in Mexico. Month after month, with ever increasing frustration, the mine owner would complain that the organization's mining engineer was not near to solving production problems at the mine. After I was no longer associated with the organization, the mine owner asked me to help. I spent one weekend, working side-by-side with the mine owner, and solved all of his problems.

There is a parallel. Those who fail to tell the full truth about the current state of knowledge disadvantage themselves and others. The progress of science depends critically on truthfulness. Recently, I published a book [45] that is available on most amazon.com platforms entitled *Paradigm Shifts: A Primer for Students, Teachers, Scientists and the Curious* (Figure 1). To my

knowledge it is the only book that teaches how to make important discoveries, as well as being a no-nonsense guide through advances in the geosciences and astrophysics.



Figure 1. Recently published book available at several Amazon.com platforms

The situation in the physical sciences is not necessarily unique to that community. Human potential is inevitably diminished by community-cartels. It is time to appreciate individuals' accomplishments in the light of truth and understanding.

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