

C. WARREN HUNT

1119 Sydenham Road SW
 CALGARY, ALBERTA, CANADA T2T 0T5
 Tel. (403)-244-3341, Fax (403) 244-2834
 Email archeanc@telusplanet.net

Marjorie Mazel Hecht, Managing Editor
 21st Century Science & Technology
 P.O. Box 16285
 Washington D.C. 20041

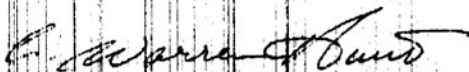
Dear Ms Hecht:

This will follow up on my letter earlier this fall drawing to your attention the pilfered information in a book of Thomas Gold, *The Deep Hot Biosphere* on which you planned to print a review. As you ignored my comments, I will give you my review of the review.

First of all, your reviewer is an engineer in automotive consulting. The review attests. In the order of the text I find:

1. Column 1, p67: There is no evidence that *tons of petroleum* are being emitted from the Earth. Gas, yes, petroleum, no. Petroleum is rare to absent below about 16,000 feet depth.
2. Column 1, p69: Petroleum in diamond is thoroughly discussed and explained by E.A. Skobelin in our book, *Expanding Geospheres* (1992). Gold is not aware, because he thinks only he has good ideas.
3. Column 2, p69: Siljan Ring is *not* a meteorite impact structure. Siljan areal oil potential has nothing whatever to do with its northern latitude (which is the same as the latitude of the Athabasca bituminous sands, the largest petroleum accumulation on Earth, and many Russian oil fields). The interior of said Siljan structure has *no* sedimentary rocks, not *few*. The interior *is* basement rock, and it is not *very thin*. Gold did not do any drilling and did not have Swedish colleagues who did. The people who put up the money were not his colleagues, and they did it for profit, *not research*. The Siljan Ring wells never produced 80 barrels of oil, much less 80 barrels per day.
4. Column 3, p69: Science was not the intention of the Siljan wells. Gold followed the Russians and pilfered many ideas from them that he brazenly calls his own. They learned nothing from him. The Russians had basement wells before Siljan was drilled, and far deeper basement wells (Kola Peninsula) some twenty years before Siljan. The Vietnam White Tiger discovery was drilled by American oil companies, not Soviet, and it produces 120,000 barrels per day, not the 6,000 figure, which is the per well rate. Gold had no input in that discovery, which was accidental, like the fifty or so basement fields in the USA for the very reason that basement oil is not believed in America to originate within the basement.

The reviewer took on a task for which he is not competent. He should stick to something he knows something about. And you should listen to a reader who is informed before publishing nonsense. Gold hungers for a Nobel prize, but he won't likely get it because of his *lack of originality*. His disingenuous tactics in dealing with others in his scientific community don't help. And 21st CS&T will not get much recognition if it publishes such junk as this review. Disney could do better.



C. Warren Hunt

PS Your magazine must be the only one in circulation without an email or fax address. Perhaps you have some reason for this, but it makes communication arduous.

Hydrocarbon Fuels Aren't Fossils

by Paul Sheridan

The Deep Hot Biosphere

Thomas Gold

New York: Copernicus, 1999

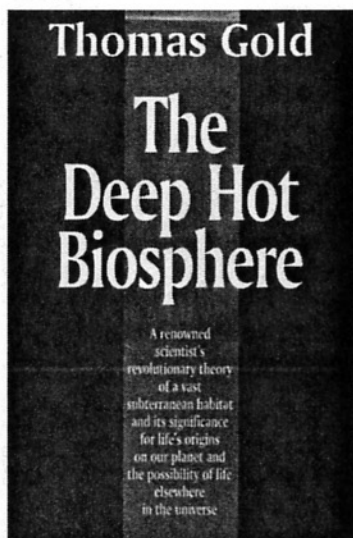
Hardcover, 235 pp., \$27.00

The Deep Hot Biosphere is a culmination of more than 50 years of the life of its remarkable author, astrophysicist Thomas Gold, of Cornell University. Gold was a founding director for the Cornell University Center for Radio-physics and Space Research, chairman of Cornell's Department of Astronomy, and is the author of more than 280 papers in the areas of cosmology, zoology, physics, and astronomy.

Gold's thesis in *The Deep Hot Biosphere* is simple: Hydrocarbons have been in existence since the earliest times of the universe, and are part of the process of planetary formation. Their constituents, hydrogen and carbon, originated in the "primordial soup" from which Earth was formed. Earth's methane and petroleum, Gold says, are *abiogenic*—without biological origin.

Contrary to the currently promoted explanation, Gold says that hydrocarbons did not dissociate during these early times because of high temperatures of planet formation, as theorists claim. Current geological science, he shows, affirms that the temperatures were not high enough, especially when depth-related pressures are taken into account.

Gold contends that hydrocarbon sources can be found at great depths below the surface, not a few miles, but a few hundred miles. The deep-Earth sources of hydrocarbons are still working to this day, pumping tons of petroleum and methane gas up through the deep Earth's cracks and pores to the shallow sedimentary levels. It is here that drilling rigs access the upwelling that has been vertically dammed into reservoirs, Gold says. Hydrocarbons did not come from rotting prehistoric plants; they were here a few billion years before life occurred.



Gold discusses the latest space research information, much of which he discovered or proposed, which confirms that hydrocarbons are present on lifeless heavenly bodies such as moons, asteroids, comets, and, of course, the gas giants Jupiter, Saturn, Uranus, and Neptune. In fact, the blue coloration of planet Uranus is the result of methane, a so-called fossil fuel. As Gold comments, "I am sure there are no big stagnant swamps on Titan or Pluto."

To support the abiogenic theory, Gold notes several points:

(1) The geographical patterns that emerge from the oil fields, whether in the Middle East or Indonesia, all exhibit a correspondence to deep-Earth geological structure. This is in stark contrast to the haphazard deposition we find with surface life, and its subsequent fossils, which have never exhibited such patterns.

(2) Hydrocarbons from a particular oil field do not exhibit chemical changes as the depth of their extraction increases. But the fossils above them have constantly changing biological "signatures," which relate to their particular paleontological periods.

(3) Hydrocarbons are found in geographic areas where the amount of prehistoric life known to be at that location

could never have provided the quantities of hydrocarbons involved. Most surface life is comprised of 90 percent water and 10 percent organic compounds. So, even if that 10 percent that is organic compounds had been entirely converted to "fossil fuels," it would not come close to the mass of hydrocarbons already extracted during the last 130 years.

(4) Because hydrocarbons are so consistent, the use of distinct trace metals can be used to identify their geographic origin.

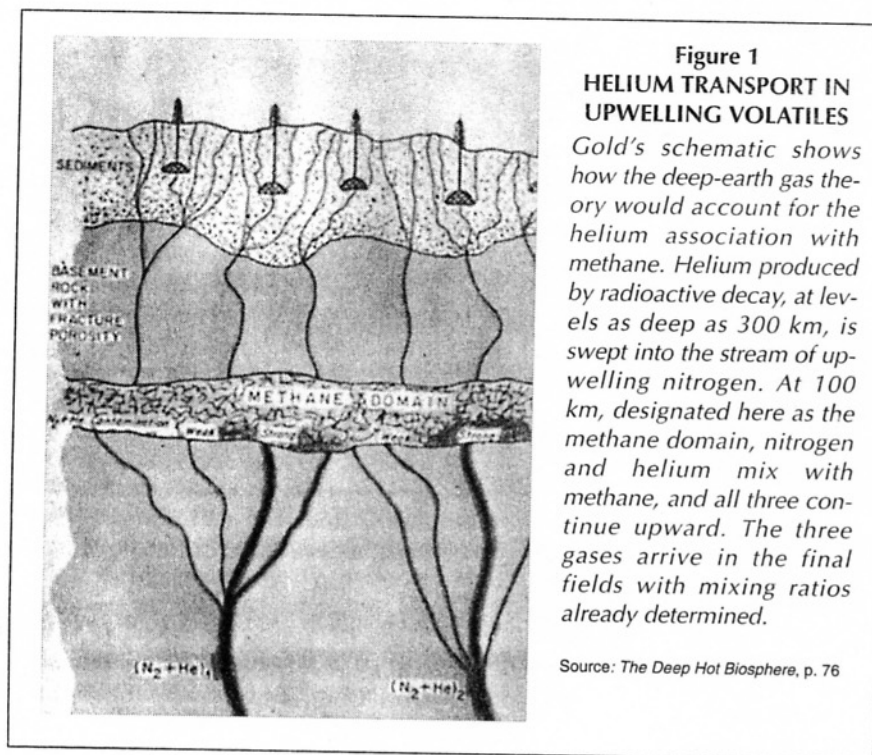
(5) The existing petroleum reservoirs are refilling themselves—from the bottom! Gold explains: "The phenomenon of petroleum reservoirs that seem to refill themselves is widely reported, notably in the Middle East and along the U.S. Gulf Coast. I regard these occurrences as strong evidence for the deep-Earth gas theory."

The Carbon Case

Life as we know it is based on the chemical properties of carbon. Although there is discussion that silicon is another element that could provide a basis for life, carbon-based life is all that we have observed thus far. The origin, quantity, and duty cycle of carbon is thus fundamental to a complete understanding of life on Earth. As it turns out, certain chemical forms of carbon are also crucial to the preservation of life.

The land and ocean areas contain sedimentary rocks which have great quantities of carbon-based chemical materials called carbonaceous compounds. A full 80 percent of this material contains oxygen; for example, calcium carbonate, better known as limestone, is an oxygenated material. The other 20 percent that is not oxygenated, is comprised of the hydrocarbons—oil, coal, and methane. There is also a tiny fraction of not-yet-decomposed biological debris that is included in the carbon content of the sedimentary layer.

Carbonaceous compounds are also found in the atmosphere, mostly as car-



**Figure 1
HELIUM TRANSPORT IN
UPWELLING VOLATILES**
Gold's schematic shows how the deep-earth gas theory would account for the helium association with methane. Helium produced by radioactive decay, at levels as deep as 300 km, is swept into the stream of upwelling nitrogen. At 100 km, designated here as the methane domain, nitrogen and helium mix with methane, and all three continue upward. The three gases arrive in the final fields with mixing ratios already determined.

Source: *The Deep Hot Biosphere*, p. 76

bon dioxide or methane. Together, atmosphere and the sedimentary layers of the land and ocean comprise what is called the atmospheric-ocean pool. The total amount of carbon in this pool is enormous, and the overwhelming majority of this "near surface enrichment" of carbon is in the sediments, not the atmosphere.

Venus and the Global Warmers

Environmentalists argue that this near-surface enrichment of carbon originated from the prehistoric atmosphere, and they promote the notion that the Earth's early atmosphere was very similar to that of Venus. Earth's carbon, they say, was "precipitated out" from atmospheric carbon dioxide into the atmospheric-ocean pool; absorption of carbon by prehistoric plants also occurred.

To hard-sell the global warming agenda, these theorists emphasize that Venus has vast quantities of the "greenhouse gas" carbon dioxide and, as a result, the temperature on its surface is about 700 degrees. However, these environmentalists usually fail to mention that Venus is 26 million miles closer to the Sun, or that its orbit is a near-perfect circle!

Unlike computer climate modellers or politicians with degrees in theology, Gold is an astrophysicist who has spent decades deciphering the details of how

planetary bodies form. According to Gold, the general cosmic conditions that formed Earth and Venus were similar, but the devil is in the details. The early Earth was not characterized by the capture of gases from space, as was Venus. An indication of this is Earth's very low

"Gold's theories are always original, always important, usually controversial—and usually right. It is my belief, based on 50 years of observation of Gold as a friend and colleague, that the deep hot biosphere is all of the above: original, important, controversial—and right."

—From the Foreword by
Freeman Dyson, Institute for
Advanced Study, Princeton

quantities of atmospheric krypton and xenon, compared with the rest of the solar system.

Gold also points out that if the carbonate rocks got their carbon from an early atmosphere, the deeper sedimentary layers should possess higher densi-

ties of carbonaceous compounds. If the carbon was "precipitated out" from an early atmosphere that was originally rich in carbon dioxide, then shallower rock specimens should show a successive decline of carbonaceous compounds.

The geological records prove otherwise, as Gold shows. There is no successive decline of carbonaceous compounds; the density is steady throughout geologic time. "The only sound explanation," Gold says, "is that atmospheric gases have derived mainly from outgassing of volatiles derived at depth from buried solid materials, not from an initial large atmosphere acquired at the Earth's formation or by later capture of gases from space."

More compelling, in my mind, is the issue of carbon-13. In the last decade, it has been proven that plants do not inhale carbon dioxide containing the heavy isotope C-13. The process of diffusion used by plants during respiration allows only the carbon dioxide containing C-12. Now, C-13 occurs in nature at a rate of just 1 percent. This means that if the hydrocarbons that were laid down over millions of years are the result of decomposing plant life, then these "fossil fuels" should show an absence of C-13. However, the samples of hydrocarbons taken from deep wells show no such isotopic constituency.

What is found is the original stellar nucleosynthesis constituency of 99 percent C-12 and 1 percent C-13. Gold cautions that a process of geological fractionalization, especially of methane, must be accounted for when discussing similar constituencies of the carbonate rocks.

The Helium Issue

Permeating every oil find throughout the history of the world, is the presence of outgassing helium. In fact, it is so plentiful at the well sites, that petroleum companies now use helium detectors as one of their oil prospecting tools, and commercial quantities of helium are piped, and repackaged for sale at well sites. Gold says: "The association of helium with hydrocarbons is probably the most striking fact that the biogenic theory ("fossil fuels") fails to account for, and therefore it has been for me of greatest interest."

Helium is inert, it does not react. It is not a member of the "primordial dozen."

(Recently, biophysicists determined that the stable nuclides that were the original minimum required for life to begin on Earth are hydrogen, carbon, nitrogen, oxygen, sodium, magnesium, phosphorous, sulfur, chlorine, potassium, calcium, and iron.) Plant life does not use helium for anything, and it is not derived from life. However, it is a fundamental product of stellar nucleosynthesis. It is also a known by-product of the radioactive decay of uranium and thorium. Both of these heavy nuclides are known to exist at great depth, about 200 miles down.

Curiously, helium is not found in meaningful quantities in areas that are *not* producing oil or methane. When the constituents of oil wells are examined for mixing ratios of helium, the data patterns are consistent throughout the world. Alone, helium does not possess the fluid pressures required to reach the surface in the manner observed.

The only way that such quantities and consistencies of helium mixing are possible, Gold explains, is by virtue of a deep source "carrier gas" such as methane. The depth of these sources is far below the penetration depths of surface life of their fossils. (See Figure 1.)

The Diamond Evidence

Another item supportive of the abiogenic theory is the data Gold gathered from diamonds, which are a pure form of carbon. The temperatures and pressures required to form diamonds begin at depths of 70 miles. This far down, where the pressures are nearly 600,000 pounds per square inch, is far below the reach and survival of fossils.

Environmentalists and others claim that hydrocarbons cannot be created in the domains of such high temperatures; diamonds would disassociate there, they say, and, therefore, could not have possibly been created there. But such claims have failed to take into account the stabilizing affects of high pressure on temperature-related excitation. In any case, Gold has confirmed that between the interstitial spaces of the carbon crystals that comprise the diamonds, one finds hydrocarbons. The biogenic theory of "fossil fuels" has no explanation for this fact of nature.

The Siljan Ring Experiment

Another example Gold uses to illustrate the abiogenic theory is that of the

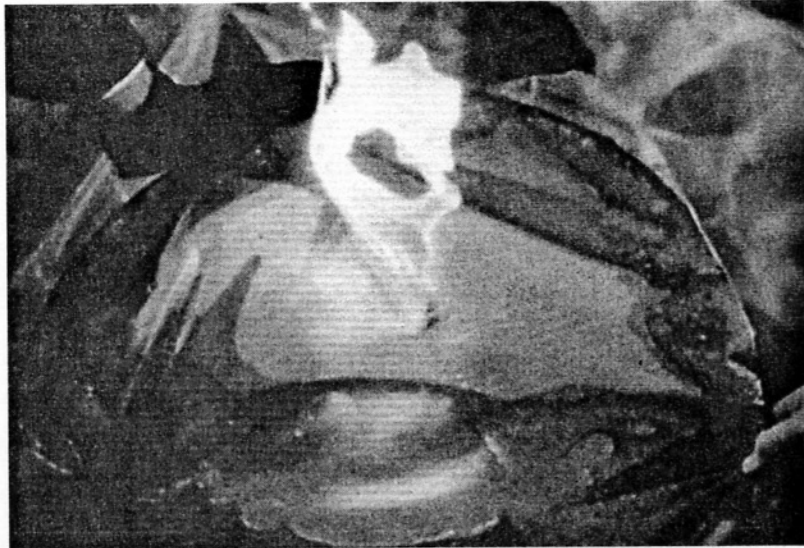


Figure 2
**FLAME SUPPORTED BY GAS EMISSIONS OVER
A WATER WELL IN THE SILJAN RING**

Methane emissions in some places within the Siljan Ring of Sweden, where no "fossil fuels" are expected to be found, are strong enough to produce a flame. For this photograph, Gold covered a water well with a plastic sheet for a few minutes, then pricked the sheet with a pin and put a match over the hole. A flame shot up 30 to 40 cm, and then declined to 10 cm. Gold aborted the experiment after 10 minutes, when the plastic began to melt.

Source: *The Deep Hot Biosphere*, p. 112

Siljan Ring, a meteor impact structure in the central part of Sweden, near the city of Rattvik. Because the location is so far north, it is not considered a site where one would find an abundance of "fossil fuels." The interior of the impact structure has very few sedimentary rocks, as a result of the impact explosion. The interior also has a basement rock that is very thin.

In 1986, Gold and his Swedish and American colleagues drilled holes reaching nearly 5 miles down from the impact interior. The idea was to penetrate the lower crust, and possibly the upper mantle. At these depths, and in this location, no surface life that was decomposed over time could possibly have existed, which makes it an excellent choice for scientific *research* intended to test the abiogenic theory of hydrocarbon formation.

I emphasize "research" here, because the intention was not the large scale production of natural gas or crude oil. Despite this format, by 1991, the Siljan Ring experiment was producing 80 barrels of crude oil per day. These are not

commercial quantities, but that was not the intention of the project; science was the intention.

The Russians have taken note of Gold's scientific findings; the major American petroleum companies have not yet done so. As of 1998, the Russians have more than 300 wells, drilled into the basement rock on the basis of the Siljan Ring experiment; all of which are producing commercial quantities of crude oil and natural gas.

Using the knowledge and experience gained from Gold, the Russians have transferred their drilling technology to their former allies in Vietnam. So far, in what is called the White Tiger Field, they have drilled 20 wells into the basement rock. The Vietnamese are producing in excess of 6,000 barrels of crude oil per day per well, in an area in which the biogenic theory of "fossil fuels" maintains there will be no hydrocarbons.

It appears that the debate is over.

Paul Sheridan is an engineer and automotive consultant, based in Dearborn, Mich.