

# THE GAIA HYPOTHESIS - A MODERN UPDATE AND ITS ROLE IN SCIENTIFIC VALIDATION OF A CREATOR/GOD

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**Introduction:** "The Gaia hypothesis" - also known as the Gaia theory or the Gaia principle, proposes that living organisms interact with their environmental surroundings on Earth, to form a synergistic and self-regulating, complex system that helps to maintain and perpetuate the conditions for life on the planet.

The following is a summary of the fascinating supporting science aspects by Dr Peter Russell of this theory (with reference to a book by James Lovelock - the originator of this theory - see below). Based on his analysis, Russell importantly makes the case for "*lifelike*" behaviour associated with this theory.

The author of this paper, Bruce Scott-Hill, while accepting his argument, extends these arguments with further evidence - also on a fully scientific basis; to show that the rock we call "Earth" - is not only in fact, a living entity, but also intelligently ensures our environment (our earth and biosphere) - is always adapted purposefully to ensure that life flourishes. In addition, that this strongly in itself supports belief *in the existence of a caring loving God, who naturally wishes his creations to prosper.*

The Gaia hypothesis was formulated by the chemist James Lovelock and co-developed by the microbiologist Lynn Margulis in the 1970s. Lovelock named the idea after Gaia, the primordial goddess who personified the Earth in Greek mythology. In 2006, the Geological Society of London awarded Lovelock the Wollaston Medal in part for his work on the Gaia hypothesis. (Ref [1])

Dr Peter Russell based his *summary* below on Lovelock's book, "Gaia - A New Look at Life on Earth". This summary, plus many other interesting articles are available on his website, see: <http://www.peterrussell.com/index2.php>

"One of the major proponents of the theory that the planet behaves *like a living system* is British chemist and inventor Dr. James Lovelock. His ideas, which have fundamentally altered many people's perception of the planet, were another fortuitous spin-off from the space race.

In the early 1960s Lovelock served as a consultant to a team at the California Institute of Technology working on plans for the investigation of life on Mars. One problem they faced in looking for Martian life-forms was not knowing exactly what they were looking for. Other life-forms might be based on completely different chemistries - on silicon rather than carbon, for instance - and might not reveal themselves to tests based on Earthly life.

Lovelock theorized that however strange the chemistry and life-form might be, there would be one very general characteristic: any life-form would take in, process, and cast out matter and energy, and this would have detectable effects upon its physical surroundings. On a planet devoid of life, the chemical constituents of its atmosphere, oceans, and soil, through their interactions over millions of years, would settle into equilibrium and the proportions of the various constituents could be predicted roughly by the laws of physical chemistry. If, however, life was present, then whatever chemical processes it was based on, almost certainly would leave the environment in a state recognizably different from that predicted by physical chemistry alone.

As a very simple example of this principle, consider a jar containing a mixture of sugar and water. Physical chemistry predicts that the sugar will dissolve until a given concentration is reached. If *life* in the form of yeast cells were added and left to grow, however, the resulting mix would be very different: there would be a lower concentration of sugar than predicted and much higher levels of alcohol and other organic products. We would determine, then, whether there was (or had been) life in the jar by measuring the sugar and alcohol concentrations.

The beauty of Lovelock's approach to life detection is that one need not visit another planet to know whether or not life is there. The basic chemistry of the atmosphere can be deduced from Earth-bound examination of the infrared, light, and radio waves coming from the planet. In the 1960s enough was known about the Martian atmosphere to suggest that it was very close to the state of chemical equilibrium; it showed no signs of the exotic chemistry characteristic of the presence of life. So, Lovelock concluded, it was extremely unlikely that there was life on Mars.

Applying a similar approach to the atmosphere, oceans, and soil of our own planet; Lovelock found that the chemical constituents were far removed from equilibrium. To the casual observer it might seem that he had merely shown that there was, after all, life on Earth. But Lovelock began to see far greater significance in these disequilibria.

First, the concentration of gases in the Earth's atmosphere differs by factors of millions from the levels predicted by physical chemistry. The predicted level of oxygen in the air, for example, would be virtually zero, yet the actual concentration is about 21 percent. This is puzzling because oxygen is a highly reactive gas, combining readily with many other chemical elements; it should therefore be rapidly absorbed. Second, and even more puzzling, the actual composition of the atmosphere has for aeons remained at a level that is optimal for the continuance of life.

After pondering many such unlikely characteristics, Lovelock came to "the only feasible explanation": the atmosphere is being manipulated on a day-to-day basis by the many living processes on Earth. The entire range of living matter on Earth, from viruses to whales, from

algae to oaks, plus the air, the oceans, and the land surface all appear to be a part of a giant system able to regulate the temperature and composition of the air, sea, and soil so as to ensure the survival of life. This concept Lovelock termed the "Gaia Hypothesis" in honour of the Ancient Greek "Earth Mother," Gaia (or Ge). In this context Gaia signifies the entire biosphere—everything living on the planet—plus the atmosphere, the oceans, and the soil.

In maintaining the optimal conditions for life, Gaia manifests a characteristic that all living systems have in common: homeostasis. Derived from the Greek for "to keep the same", the term was coined by Claude Bernard, a nineteenth-century French physiologist, who stated that "all the vital mechanisms, varied as they are, have only one object: that of preserving constant the conditions of life."

An example of homeostasis is the human body's maintenance of a temperature of about 98.6 degrees Fahrenheit, the ideal temperature for the majority of the body's processes. Although the external temperature may vary by scores of degrees, our internal temperature seldom varies by more than a degree or two, the body cooling itself through sweating and warming itself through physical activity and shivering. The regulation of the number of white blood cells, the control of acidity, salt content, and the delicate chemical balance of the blood are homeostatic processes as well. These and many others maintain the best internal environment for the continuance of your body's life processes. Such processes are found not only in the human body and in all living systems but also within Gaia herself.

Gaia appears to maintain planetary homeostasis in a variety of ways, monitoring and modifying many key components in the atmosphere, oceans, and soil. The data that Lovelock amassed in support of this contention is fascinating, and the interested reader should take a look at Lovelock's book *Gaia: A New Look at Life on Earth*, and his sequel *The Ages of Gaia*. In summary, some of the indications of Gaia's homeostatic mechanisms are:

The steadiness of the Earth's surface temperature: Although life is found to exist between the extremes of 20 and 220 degrees Fahrenheit, the optimal range is between 60 and 100 degrees Fahrenheit. The average temperature of most of the Earth's surface appears to have stayed within this range for hundreds of millions of years despite major changes in atmospheric composition and an increase in the heat received from the sun. If at any time in the Earth's history the overall temperature had gone beyond these limits, life, as we know it, would have been extinguished.

The regulation of the amount of salt in the oceans: At present the oceans contain about 3.4 percent salt and geological evidence shows that this figure has remained relatively constant, despite the fact that salt is being washed in continually by the rivers. If the salt concentration had ever risen as high as 4 percent, life in the sea would have evolved very differently. If it had exceeded 6 percent, even for a few minutes, life in the oceans immediately would have come to an end, for at this level of salinity cell walls disintegrate. The oceans would have become like the Dead Sea.

The stabilization of the oxygen concentration of the atmosphere at 21 percent: This is the optimal balance for the maintenance of life. With a few percent less oxygen, the larger animals and flying insects could not have found enough energy to survive; with a few percent more, even damp vegetation would burn. (A forest fire started by lightning would burn fiercely and indefinitely, eventually burning all vegetation on the Earth's land surface.) See Note 1 below.

The presence of a small quantity of ammonia in the atmosphere: This is the amount needed to neutralize the strong sulfuric and nitric acids produced by the natural combination of sulphur and nitrogen compounds with oxygen (thunderstorms, for instance, produce tons of nitric acid). The result is that rain and soil remain at the optimal levels of acidity for the preservation of life.

The existence of the ozone layer in the upper atmosphere: This shields life on the surface from ultraviolet radiation, which damages the molecules essential for life, particularly the DNA molecules found in every living cell. Without it life on land is impossible.

On the basis of these and other "homeostatic" behaviours, Lovelock concludes that the climate and chemical properties of the Earth seem always to have been optimal for life as we know it.

Critics of the Gaia Hypothesis might argue that the origin and maintenance of life on this planet have resulted from a series of very lucky coincidences, rather than planetary homeostatic behaviour. If, for example, the proportion of ammonia in the early atmosphere had been a little higher or lower, the Earth would have ended up too hot or too cold for life. They might argue that it has been a series of flukes that kept the planet's surface temperature roughly constant while the sun's output changed; a series of flukes that kept the levels of carbon dioxide, oxygen, salt and many other chemicals at optimal levels for the maintenance of life; and a fluke that there is an ozone layer to protect us from lethal quantities of ultraviolet light.

In the same way, a cell in the human body, observing the body's continued survival through heat, cold, and many other changes, might, if it were so inclined, put it all down to a series of lucky coincidences; the body just happens to sweat when it is hot, just happens to shiver when it is cold, just happens to take in the right amount of nutrients when they are needed. Perhaps by a fluke, blood sugar, acidity, and salinity stay at the optimal levels and red blood cells happen to bring along oxygen and take away wastes. From such a point of view, the body survives from one moment to the next as a result of an extremely fortunate series of coincidences.

This quite definitely is not the case. The body behaves in a well-ordered manner with a definite sense of purpose. It sweats, shivers, eats, breathes, and regulates its internal functions and chemical constituents in order to preserve homeostasis, and so survive.

Just as this self-regulating principle makes more sense of the body's activities, so it makes more sense of the planets. Gaia appears to be a self-regulating system, continually adjusting its chemical, physical, and biological processes in order to support life in its continuing evolution.

Does the Gaia Hypothesis imply that the biosphere is a single living organism? Lovelock is cautious on this point. He sees the atmosphere to be similar to a beehive, a biological construction designed to maintain a chosen environment, though not actually living in itself.

But if we take the atmosphere, oceans, and soil to be intrinsic parts of a complete biosystem, **couldn't we then speculate that the system as a whole is alive?"**

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**Comment: (by Bruce Scott-Hill)**

Russell's list of Gaia's attributes, which are thought to maintain planetary homeostasis favouring life, is by no means complete. Some other attributes of considerable importance taken from astrophysicist George Greenstein's book, "The Symbiotic Universe", are as follows: (these are also covered and taken from my book). (Ref.)(2)

- The 23-degree axis tilt of the earth is optimum. If the tilt were altered slightly, surface temperatures on earth would be too great.
- Water vapor levels in the atmosphere are critical, if greater than they are now, a runaway greenhouse effect would mean temperatures rise would be too great for human life; if less, the earth would be too cold to support human life.
- If the thickness of the earth's crust were greater, too much oxygen would be transferred to the core to support life. If thinner, volcanic and tectonic activity would make life impossible.
- If earth's rotational period was longer than 24 hours, night and day temperature differences would be too great. If the rotational period were shorter, atmospheric wind velocities would be too high.
- If the lightning discharge rate were greater, fire destruction would be intolerable; if less there would be insufficient nitrogen fixing in the soil.
- If there was greater seismic activity, more life would be lost; if there were less, nutrients on the ocean floor and runoff would not be cycled back to the continents through tectonic uplift.
- If the moon did not exist there would be no tides, oceans would become stagnant, causing life threatening emanating dangerous methane and sulphur dioxide. If closer, monstrous tides would make coastlines and large tracts close inshore, uninhabitable. [The above attribute is added by the author. There are many others, e.g. The Gulf Stream's role in aiding temperature distribution throughout the planet, etc.].

I fully agree with Dr Peter Russell on his dismissal of chance as a factor that could possibly explain eons of continuous adaptations of our planet "Earth" favouring differing forms of life. Indeed, it would be hard to argue otherwise, after one studies the further evidence provided in the list immediately above. Not only that, but also there is overwhelming independent "solid" science evidence which Russell seems unaware of, which additionally suggests that his speculation (above), that "*the system as a whole is alive*", must also be correct.

This is the concept of "*panpsychism*" - which argues that all matter (however small i.e. subatomic particles) is alive and exhibits some form of consciousness. The background to this is that the great scientist and quantum physicist David Bohm in 1943, while at Berkeley Radiation Laboratory, identified a virus like *purposeful* behaviour of electrons forming plasma. He called such collective movements of electrons "plasmons" and their discovery established his reputation as a physicist. This discovery was later verified by Gary Steinman and Marin Cole at the Pennsylvania University, where evidence was found that molecules significant for life were made preferentially. (Further detail and evidence is provided in my book referenced above, on the pervasiveness and ubiquitous of life among all things, whether material and non-material). (Ref. [3]) Although the above meets the high "solid" science demand requirements of replicated independent laboratory experiment; most materialist scientists and biologists have apparently ignored these findings. To do so I guess (rather like climate deniers), is a bridge too far for them to accept the reality of the pervasiveness of life itself and to extend this concept to what was formally regarded as inanimate life - including all

objects (even subatomic particles). To universally do so, would of course unacceptably make them confront the question of who? created this consciousness.

Given this; with Dr Russell's logical dismissal of chance as a factor (since it cannot possibly fit the facts, see also Note 2) and with life now shown above to reside in all objects; we have to confront the inescapable reality that amazingly, our own "mother" "Earth" is living. Therefore, it must have a form of consciousness, and from the evidence above, has actually changed its environment down the ages purposefully and directly to favour, adapt and support its dependant life clinging to its surface. This includes ourselves as humans, and all other forms of life. Shockingly though, it follows that **unless all this was somehow designed and orchestrated**; there just cannot be any other rational explanation.

Despite this, unfortunately in the era of Lovelocks books 1974-2006, biologists were enthusiastic about a counter-theory; by arguing that over time, mutually beneficial stable self-generated eco-systems in various habitats would form which favoured life (including earth's biosphere). Unsurprisingly, the theory of stable bio-systems was eventually discarded towards the end of the century. In reference to the Gaia Hypothesis, it was then said that, "*The theory that nature is permanently in balance, has been largely discredited - as it has been found that chaotic changes in population levels are common.*" (Ref. [4]) One should note that this must also apply to the concept of "homeostasis", which while naturally applicable to a given lifeform, should never have been applied externally in the first place i.e. the original stated reason suggested by even Lovelock for the "Gaia hypothesis". No sooner was the theory of bio-systems discarded, then it was presumably quickly replaced by the current accepted materialistic mainstream scientists explanation for The Gaia Hypothesis, with the feeble and completely unacceptable assertion, that: "*The Gaia Hypothesis, can be explained as "an undirected emergent property or entelechy of the system; as each individual species pursues its own self-interest"*" (Ref. [5]) - namely gobbledegook, and just an assertion masquerading falsely as logic. This is because it doesn't even answer the question as to how the "Earth" itself, climate and atmosphere (not just interactions amongst other biological lifeforms), could itself adapt marvellously to cater for unforeseen future variations in life; as is self-evident by Earth's adaptive changes to suit life in eons past. Nor are any explanations offered whatsoever, as to how such favourable adaptations could occur. (Readers may well recall that use of the word "*emergence*", is exactly the same argument suggested by most materialistic mainstream scientists to assert as to how mind/consciousness occurs. In this case, the argument asserts that consciousness is an "*emergent* epiphenomenon of the brain" - when in fact all the evidence is the opposite i.e. that mind/consciousness resides outside the brain, and is primary, not secondary. (Ref. [6]) We are expected to believe by the use of the word "*emergence*"- see Note 3 below, that somehow this explains everything. Which is rather like the word "instinct" which by itself explains nothing. One can only conclude that the word "emergent" or "emergence", has become a new convenient 'catch cry' deception to conveniently explain anything - perhaps typically when there is any hint of a possible a spiritual origin).

They have (deliberately?) ignored the fact that the Gaia Hypothesis shows clearly that our "Earth" adaptations described above by their very nature - exhibit *purposeful* behaviour. But not just simple purposeful behaviour, one could program into a machine or computer but *intelligent* behaviour - which can cater for any eventuality with the sole aim of brilliantly sustaining and nurturing lifeforms on its surface. Such intelligence in fact followed by *action* - to vary climate, atmosphere, planet orientation, spin, chemicals, surface temperature etc. to intelligently nurture and support life. Obviously since we - the most intelligent species on the

planet, are not responsible for this, we sensibly must consider that a higher intelligence than ourselves, is involved – as there simply is no other rational explanation. Surely therefore, the only possible explanation we can possibly conceive of, is that it most likely must have been designed and created by a creator type God - that most definitely must and understandably wish His creations to survive by ensuring and *orchestrating* adaptations which favour life. Why else, should anything, or entity care about survival of lifeforms on a somewhat unremarkable hunk of rock (our “Earth”)?

In other words, despite any religious belief whatsoever; and independently, The Gaia Hypothesis supports the concept of both a living creator/God, but also a God with the welfare of all, and every one of His creations in mind.

**Supplementary Evidence:** Finally and ignoring (reluctantly) science; importantly esoteric literature *supports the contention of a purposeful, intelligent, living conscious “Earth”*. In that, a teaching type statement in a channelled type book, quoted by Professor Stafford Betty from the book, “Letters from the Afterlife”, a former Judge David Hatch, channelled by Elsa Barker - has this to say on the issue, *“I have been told, that there are also planetary beings, planetary gods... the guardian spirit of this planet “Earth” evolved himself into a god of tremendous power and responsibility in bygone cycles of existence...”*.(Ref. [7]) Also, from Jane Roberts Seth book, The nature of Personal Reality *“The body of earth can be said to have its own soul, or mind (whichever term you prefer). Using this analogy, the mountains and oceans, the valleys and rivers and all-natural phenomena spring from the earth’s soul, as all manufactured objects appear from the inner mind or soul from mankind.”* Page 3, of Jane Roberts “Seth” book, “The Nature of Personal Reality”. Also *“Everything that you experience has consciousness”* – Seth (the entity channelled by Jane Roberts). (Ref. [8])

Since we, as humans are temporarily inhabiting a *primitive* human body to gain an earthly experience, why should we deny the possibly of a very advanced entity, so capable that he/she appears to us to be Godlike, temporarily inhabiting our “Earth” to assist us, adapt “Earth” continuously to favour its inhabitants; and thereby enjoy a similarly different, but more advanced form of an evolutionary “Earth” experience, than ourselves?

- Bruce Scott-Hill

Notes:

- 1 With the initial development of plant life and photosynthesis, earth’s primeval atmosphere largely comprised carbon dioxide - which as it favoured plant respiration, enabled forests to flourish. But with the arrival of oxygen breathing animals, the oxygen levels changed to the 21% evident both then and today. Coal deposits, caused by falling trees over eons, later provided needed energy for mankind.
- 2 The French Mathematician Emile Borei determined that when odds are greater than 10 (to the power of 50), an argument by chance is virtually impossible. Any quick probability estimate taking all of the above attributes into consideration, would rule out any chance possibility completely. (Ref. [9])
- 3 “Emergence” – as meant here, infers the spontaneous appearance of a new characteristic that could not be foreseen e.g. often quoted as occurring from a phase

transition such as water into steam, or water into ice crystals etc. The science basis for these particular transitions are known (even the fractals patterns in ice crystals can mathematically be vindicated), whereas the analogy above is but an assertion without sufficient substantiating evidence. Even atheist Professor Richard Dawkins rejects this explanation for the Gaia hypothesis, as he says the "Gaia" attributes above indicate they "*would require foresight and planning*". (Ref. [10]. Others have similarly criticised this, as asserting magic, and unacceptably arguing that something can happen from nothing (e.g. the respected philosopher, Mark A. Bedau). (Ref.[11]) Deceptive claims also without adequate evidence are also often made using the concept of: "self-organising systems" to explain the Gaia hypothesis, but also to explain the so-called mystery of bird flocks (and sadly many other attributes of nature – even life itself!). Again, these are just words, but like the word "instinct", explain nothing in themselves and should (as above) not be used as a "catch all". Ironically "Instinct" (with the meaning of: "species specific pre-formed behaviour evident at birth") gives a more likely partial explanation for why birds flock together. This, and the other main reason (there are others) is now thought to be, "group consciousness linked - behaviour" where all members of the group become quantum "entangled" together, and inevitably act like one. (Ref. [12]) Significantly, "a self-organising system" was also one of the supposed explanations earlier also given to biosystems – yet ludicrously the concept of biosystems itself (as above), has now been completely discredited.

Why materialistic scientists think they can explain consciousness type attributes by inadequate and often false assertions - when these are clearly areas which relate to the scientific expertise of neuro-scientists and quantum experts, is beyond me.

## References:

- 1 Wikipedia.
- 2 "The Paranormal is Normal", by Alastair Bruce Scott-Hill, Appendix 2, Pg. 315
- 3 Ibid – Pg. 41
- 4 Wikipedia.
- 5 Wikipedia.
- 6 "The Paranormal is Normal", by Alastair Bruce Scott-Hill, Pgs. 43-47,60-64, 74-76
- 7 'The Afterlife Unveiled: What the Dead are Telling Us About Their World', by Stafford Betty. Chapter 3, Loc. 543. Kindle Edition).
- 8 "The Nature of Personal Reality" by Jane Roberts, Pg. 3 and 4.
- 9 "The Paranormal is Normal", by Alastair Bruce Scott-Hill, Appendix 2, Pg. 15
- 10 Wikipedia. (In Richard Dawkin's 1982 book, "The Extended Phenotype").
- 11 Wikipedia.
- 12 "The Paranormal is Normal", by Alastair Bruce Scott-Hill, Pg,69

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