

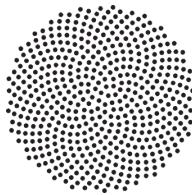
How to make sure Gaia is not a God? with special attention to Toby Tyrrell's book *On Gaia*

Bruno Latour

Since we are assembled for a sort of political, scientific and anthropological ritual in order to review, utter, celebrate, list, enlarge, narrow down, pin point, conjoin or compose the Thousand Names of Gaia, title of this conference, I have decided to go through as many names as I can in 45 minutes by considering once again the writings of James Lovelock and of some of his many critiques.

I have to confess I have now a pretty devious habit: when I meet a geologist, a geographer, a geochemist, or some expert in geopolitics, after a few minutes of conversation about what sort of topic they research, I conclude: "Then, why don't you say that you are, in fact" (and here I adapt my sentence to each specialty) "a Gaialogist, a Gaiographer, a Gaiachemist, or someone deeply involved in Gaiapolitics". And then I observe with some amusement how they react to this falsely innocent change in the prefix. After all, geo- and Gaia share exactly the same etymology, both come from the same entity Gè, actually a chthonic divinity much older than Olympian gods and goddesses, the primitive power who is sometimes addressed with the very apt epithet of **Thousands**

Folds. The reactions of the scientists thus addressed are hugely entertaining: they position themselves, according to my admittedly small sample, along a gradient that goes from utter incomprehension ("what did you say?"), then to indignation ("Me? A Gaia something, no way, absolutely not") to surprise ("after all, why not? Yes, in a certain sense, if you say so") to complete approval, as if this was somewhat obvious and no longer in



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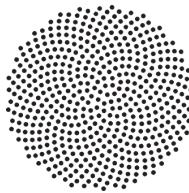
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need of being stressed that they work on Gaia ("yes of course, I have devoted my all professional life to it, why do you ask?").

If I play this little game, it is because I have learned that the invocation of Gaia is sure to trigger confusion, to agitate, to provoke, to make people think anew about this innocent prefix "geo" which had become dead and stale after having entered into the name of too many disciplines. What the prefix "geo" no longer provokes, "Gaia" does. That's one another of its title **Gaia-Enigma** or, to give her the epithet Isabelle Stengers has popularized **Gaia-The Intruder**.

Thus is of course also the reason why Lovelock had grabbed this name so avidly from the lips of his novelist friend, William Golding. Short like an acronym, easy to say in all languages, it has made, ever since the 70s, everyone who hears the name think twice about what it means to study "the Earth". In that sense the somewhat wild proliferation of the prefix "Gaia" exactly parallels the transformation of how the distant presence of the Earth has been formatted in public discourse: what, as far as we remember, had constituted a solid but distant and faithful background for various geosciences and for staging the usual drama of geopolitics, has become, no matter which political persuasion you come from, an actor, at least an agent, let's say an agency whose irruption or intrusion upon the foreground modifies what it is for the human actors to present themselves on the stage. Whereas you could consider "Geo" from the outside standpoint of a disinterested observer, with "Gaia", you are inside it while hearing the outside/inside boundaries loudly crashing. To be a disinterested outside observer becomes slightly more difficult. We are all embarked in the same boat — but of course it's not a boat. So, as a consequence, Gaia-politics cannot be the same as geopolitics, nor will Gaia-sciences have the same tone as geosciences. Hence its other title **Gaia-The Party Spoiler** (Clive Hamilton's epithet) or **Gaia the Gate-Crasher**.

And that's the problem we have to tackle: the very success of the prefix "Gaia" makes it difficult to stabilize it. While the prefix "Geo" is stale, "Gaia" is hyperactive.

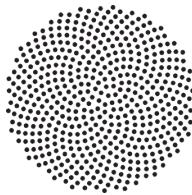


But don't think that the solution, when talking with scientists of various persuasions, would be to abstain from using the word as if not using it could transform the question in a "strictly scientific one". For instance, by using the word "Earth System Science" as a more subdued scientific expression. In spite of its innocuous and vaguely cybernetic aspect, to speak of the Earth as a "system" is just as confusing, because, as I will show, its political and philosophical pedigree is much harder to render explicit. At least with Gaia you know that what have on your plate is a hot potato that might burn your mouth if eaten too eagerly. With the apparently simpler "Earth System Science" you might be lulled into believing that you feed on a perfectly standardized fare.

That abstaining from using the disputed term is not longer an option has been made even clearer to me through the attentive reading of a book titled *On Gaia. A critical investigation of the relationship between Life and Earth*, written by Toby Tyrrell a professor, precisely, of "Earth System Science" at the University of Southampton.

The book itself is full of interesting, well written, and highly pedagogical summaries of recent results from various Earth sciences. It is also politically relevant in the sense that, if it worries so much about the popular use of what he calls the "Gaia theory" which he mixes up with **Nanny-Gaia** (more of this in a minute), it is because it might let the public believe that, whatever they do, **Gaia-Nurturing Mother** will take care of their well being. So why pick up on this book in particular? Well, because there exist books which are so well written, so clear headed but so uncomprehending of their own subject matter, so nicely obdurate in their thinking, that they render, in the end, a great service in clarifying issues by missing them so relentlessly... That's the case with Tyrrell's attempt. I have rarely read such "uncritical investigation" of any scientific theory.

What is amazing in this book is that at no point does it even begin to understand Lovelock's exploration of the Earth and seems to really believe that considering life on the planet as a System instead of as Gaia will be render its discipline



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"strictly scientific". The whole book is framed as a set of long smug and condescending lessons of scientific method to castigate poor old outdated Lovelock. A set of lessons that:

first), attribute to Lovelock a position he has never held, a sort of political theology as if a providential Life (capital L) was ruling over, above, in addition, to the Earth for the benefit of all organisms

second) substitute to this political theology another one, roughly a neo-liberal version of neo-Darwinism, that is even more fanciful,

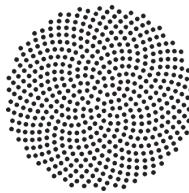
third) in the end accept as obvious most of what Lovelock and Margulis had fought so long to make people understand: namely that you cannot distinguish between organisms and their environments any longer.

Let's pass quickly on the third point: Tyrrell accepts the superficial aspects of Lovelock's Gaia, relabeled "co-evolution", a reasonable position for a rather dubious term, against what he defines as the geological attitude rightly summarized as the following:

"Life has been a passenger on Earth, helplessly buffeted by externally driven changes in the environment. Life adapts to the changing environment but does not itself affect it" p. 8.

In other words, Life for geologists of earlier periods had no agency whatsoever. Abandoning this position is thus to recognize that Gaia is **Planet Not Dead** and that would have been sufficient, in my view, to vindicate most of Lovelock's and Margulis enterprise. (By the way how do you say "Not Dead" when you fight in the 70s against such an entrenched position? It's pretty standard to use the adjective "Alive", right? So **Gaia-Alive** does not say what it means to be alive, simply that planet Earth is not dead as Mars or Venus). Anyway, Tyrrell loyally recognizes around chapter 6 that Lovelock was right after all:

"Lovelock claimed that life does modify the environment. Life is not simply a passive passenger living within an environment set by physical and geological processes



over which it has no control. The biota have not lived within the Earth's environment and processed it but also, it is suggested, have shaped it over time." p. 113

and he adds:

"There is no doubt that Lovelock is correct, and few now disagree."

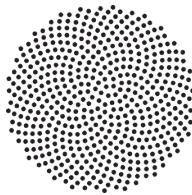
Everyone seems to agree on what could be named **Gaia-Connectivity**, and accept, to use Donna Haraway summary: that the concept of "bounded individuals plus contexts, or organisms plus environments" is no longer able to "sustain the overflowing richness of biological knowledges". But this is not at all the line Tyrrell is going to follow. He is not going to explore the novelty of Lovelock and Margulis' argument that could be summarized, Haraway again, as the discovery of:

"complex non-linear couplings between processes that composes and sustain entwined but non additive subsystems as a partially coherent whole"

("Non additive" and "partially" are crucial term as we shall see.)

Let's address this Gaia by the epithet proposed by Haraway as **Gaia-Sympoetic** (I feel that I am doing for Gaia what Catholics do to Virgin Mary's titles: that is compiling lists of epithets after epithets like "Queen of Heaven", "God-Bearer", "Star of the Sea", "Mater Misericordiae", "Rose of the Garden", and so on, a nice ritual indeed worth extending to Gaia's cult!).

So why all the fuss? Unfortunately, far from attempting to explore this dense set of biological novelties, Tyrrell has decided to fall back on another project entirely, that is, building a strawman if a strawman had ever be conjured out of nothing. Not exactly out of nothing, but, as often happens when people invoke Gaia too quickly, out of good old political theology. What is amazing is that Tyrrell believes to be fair and balanced in his clear-headed assessment of Lovelock, by attributing to his Gaia a theomorphic position Lovelock never held — and we shall see that Lovelock is probably the first to have so thoroughly dismantled. To impute to Lovelock his fanciful Gaia, Tyrrell uses a vocabulary



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that would have been familiar to pious souls at some time, let's say, around the 13th century.

From the very first page of Tyrrell's book, the idea attributed to Lovelock is defined in the following way:

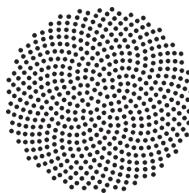
"Gaia, the idea that life moderates the global environment to make it more favorable for life, was first introduced in 1972 in an academic paper titled "Gaia as seen through the Atmosphere"."

Seems correct, except for one little thing: Life is now written as if it were the agent lording over organisms much like the spirit floating over the water. Whereas, in Lovelock, there is nothing in the whole that is not in the parts, and this is precisely the novelty of not adding a superior level, Tyrrell falls straight into the trap and imagine that Life is a Whole different from its parts as if this had been Lovelock's position all along. Instead of Lovelock's discovery that we should not think in terms of parts at all, Tyrrell shifts unwittingly to a classical distinction between parts and whole, borrowed straight out of social theories — which have borrowed them off the shelf from theology.

And such a fanciful view of Gaia is repeated every chapter:

"The Gaia hypothesis is nothing if not daring and provocative. It proposes planetary regulation by and for the biota, where the "biota" is the collection of all life. It suggests that life has conspired in the regulation of the global environment, so as to keep conditions favorable." p 3.

Except there would be nothing "daring and provocative" anymore had Lovelock held such a theory, God the Creator had been there before! For Lovelock the "collection" is never collected by anything more than the process by which the organisms themselves are intertwined, on the condition you find a way to follow the collecting process. Tyrrell ignores the difficulty and transform Gaia into some figure of the Optimum, a strange mixture of Market and State theology — the word "regulation" being the hate term of neo-liberal ideology. And to make sure his misunderstanding is complete, every



political philosophy figure of order and providence is borrowed unsuspectedly as a description of Gaia:

"Lovelock suggests that life has had a hand on the tiller of environmental control. And the intervention of life in the regulation of the planet has been such as to promote stability and keep conditions favorable to life." p. 4

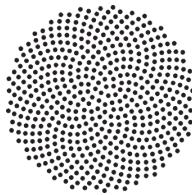
Gaia is now seen as a natural version of the United Nations "promoting stability". Let's call it **Gaia-Global State of Control**. I love the idea of "Life at the tiller", a cybernetic metaphor of politics if any, **Gaia-Kaiser**, **Gaia-Ur-Kontroller**. And this is what passes for a scientific reading of a theory unfortunately muddled, Tyrrell says, by Lovelock's use of metaphors and out of date results!

There is even better. Since the whole argument has become a theological one – Gaia should protect life everywhere as a sort of **Pro-Life** activist – there comes a point when this divinity is accused of not doing the optimal good it should. Then, the question is for Lovelock to defend **Gaia-Fatherly God** against the presence of Evil on Earth. Lovelock is now supposed to play the role of Leibniz in his Theodicy and justify **Life-God** against the accusation of being unfair to its constituent "citizens", "sons" or "adepts". Hence the imaginary defense lawyer's plea:

"A well-regulated planet could hardly be blamed for being buffeted about by the vagaries of celestial mechanics and collisions, and can even be congratulated for its multiple recoveries from the terrible devastations of extraterrestrial impacts." p.130.

"Well regulated planet"? On which planet does this man live? If it is ironic, the irony certainly rebounds on the author able to imagine that the Problem of Evil has anything to do with Gaia. Actually, page after page, every cliché borrowed from the socio-political domain is attributed to Lovelock's Gaia:

"Ensuring that the global environment remains propitious to life is up to us and there is no Gaian safety net to come to the rescue if we mismanage it" (p. 218).



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No “safety net”? Really? The author, educated into neoliberal England, cannot imagine any power other than a well regulated State insuring a social security safety net — we now have, in addition to Gaia-Nanny, a **Gaia-Providence-State**.

Needless to say that, having propped up such a straw man, Tyrrell has no difficulty in proving, chapter after chapter, that Lovelock has been wrong all along. He then endeavor to prove through a great wealth of data that Gaia is not a well ordered polity, having made life comfortable for its inhabitants. Hear the lesson, you reader of Tyrrell’s book: Gaia is not a benevolent God. Surprise, surprise.

Let’s review just a few examples of how it goes:

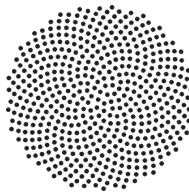
Chapter two and three: the invocation of “selfish genes” is enough to prove that Gaia cannot exist since it cannot be taken as an organism molded by Evolution inside a milieu (more of this in the next section).

“In fact the snug fit between organisms and habitats is more a testament to the overwhelming, transforming power of evolution to mold organisms than to the power of organisms to make their environment more comfortable.” p. 48.

Which is exactly the opposition between organisms and environment that Lovelock had put to rest. On Lovelock’s Earth nobody is in position to “mold” any body else any longer, that’s the whole point since it is the very divide between the two that Lovelock has shown to be a wrong headed way to understand life.

Chapter 4 and 5 are long theodicy argument proving that since Life has not been so benevolent to its adepts, so Lovelock must be wrong in his defense of **Gaia-Providence!**

“If the nitrogen cycle were really controlled by a mechanism that worked on the behalf of the biota, we would expect either N₂ fixation rates to be higher or fixed nitrogen destruction rates to be lower” p. 110 “to my mind this paradox of nitrogen starvation while being bathed in nitrogen is one of the strongest arguments against the



Gaian idea that the biosphere is kept comfortable for the benefit of the life inhabiting it" p. 111.

The idea of life "inhabiting the biota" is as curious as any mechanism working "for the benefit of life" or the perspective "of a fault finding engineer expecting the Earth to be managed for the benefit of its life" p. 109. Who could imagine that Gaia should have thought of providing nitrogen to its citizen in a usable form, much like Yahweh in the desert providing His manna to take care of his elected People.

And the author goes on and on, every time unaware of the strange operation by which he fights a totally implausible political philosophy before proudly emerging from each chapter with an exclamation of victory. This is an example toward the end:

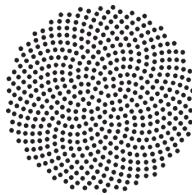
"The Gaia hypothesis proposes that life has had a hand on the tiller of climate, ensuring stable equate climates throughout Earth history. The picture revealed in this chapter is by contrast rather different." (p. 169).

Of course, it is different! How could one imagine that when you talk of order, you talk about the theomorphic figure of the providential Nanny State, the only one a good Britton steeped into the religion of individual selfish genes has learned to debunk. And now be prepared for the final stroke, chapter 9 can triumphally states:

"For these reasons it can be concluded that the long and uninterrupted duration of life-tolerant conditions does not prove the existence of an all-powerful thermostat, and does not prove the existence of Gaia." p 198

Attempting to prove the (non) existence of God seems to me a strange exercise for a grown up, as strange as to borrow the old theological idea of the "omnipotence of God" to name a Thermostat! It seems that **Gaia-Air Conditioning System** should be added to our list of epithets!

It would be boring to go through all the chapters since Tyller's critique is so irrelevant to the figures of Gaia that interest us. Who needs to have another proof of the



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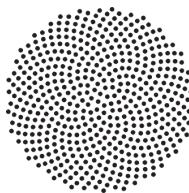
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non-existence of God parading as a scientific treatise? But it is nonetheless admirable to witness the seriousness with which the author, blissfully ignorant that he is himself using metaphor from beginning to end (the inevitable “selfish gene” fighting against this fanciful “well-regulated” **United States of Gaia**) accuses Lovelock of lack of scientific rigor! Tyrrell’s book is a nice illustration of the Gospel about the speck and the log” (Matt 7:3).

It is true that scientists are so convinced that they, and they alone, speak literally, that they are often totally unaware how far the tropism of language take them drifting far away from their goal. I am sure Tyrrell is a serious, well-meaning scientist and that he really believes he has directed his critique to Lovelock’s Gaia. That he has drifted so far away from his target would come to him as a complete surprise. Let me give you one last example to show how deeply unaware he is of the perversity of language: having personified Evolution, Life, Environment and Gaia and having given them agency, he believes than in the following sentence, some movement of meaning has been achieved:

“There are three possibilities: either (1) environments fit organisms because the collection of life on Earth (the biota) has manipulated its environments to be especially commodious (Gaia) or (2) evolution has manipulated the biota to be especially well adapted to the environments it inhabits, or (3) a combination of (1) and (2). Obviously, if all or most of the fit is due to evolution, then the good fit is a testament more to the powers of evolution than to the existence of Gaia” p. 57.

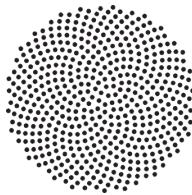
Three possibilities when there is none! Even if you leave aside “manipulation”, “commodious”, “inhabiting” and “fit”, how could you oppose Evolution and Gaia as if they were two different agencies competing with one another? Both entities have been emptied by his use of language of any meaning since they are framed as residing above, or in addition, or under, or before the organisms themselves. Which is precisely, as we shall see, what Lovelock has undermined, offering us what I take to be the first totally non-providential version of what it is to compose a whole. Gaia, in spite of her godly name, inherits none of the political theology that has paralyzed Nature as well as Evolution. By



misunderstanding his own field of research so obstinately, Tyrrell, in the end, makes this point marvelously.

Okay, enough of Tyrrell. Remember that, in spite of what I just said, the book is worth reading. The author has very aptly summarized recent research on climate changes, extremophiles, weathering and biochemical reactions, even though he has framed those summaries into a totally irrelevant argument against a Providential **God of the Earth**, before emitting, in conclusion, a useful warning to those who do nothing against the present crisis: because, as he says, "a Gaia-mindset unconsciously predisposes toward undue optimism" p. 211 it can "inspire a false sense of security." p. 212. He is surely rightly to warn the quietists: "Because the Earth's climate system has transpired, as opposed to evolved, there is no reason to expect it to be particularly robust or fail-safe" p. 216. ("Transpired" by the way, is a nice conceptual innovation, the only one in the whole book as far I can see). The old idea of **Gaia-Balance-of-Nature** should always be criticized; this is why, as a useful counterpoint, the contrapuntist figure of **Gaia-Medea** has been proposed by Peter D. Ward. But the problem is that this is not at all the topic that had been introduced by Lovelock's Gaia. Inheriting from the Devil is not in question.

Now I am sure you will say that I have been unfair to poor Tyrrell and that Lovelock did talk about thermostat, about making the Earth comfortable for life etc. But there is a big difference, a difference that shows the huge gap between a scientist who stick to one genre that he or she believes is the "scientific worldview" (that is, most of the time, a set of clichés taken as literal description) and a scientist who think through and against the clichés to explore a new description of a state of affairs. The big difference is this: while the first stick to the same set of metaphors to give the impression of a technical and literal language (even "selfish gene", if uttered long enough, could be been taken as a "scientific concept"), the second ceaselessly modifies his or her metaphor. What Tyrrell



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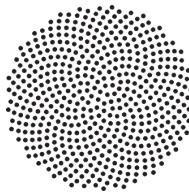
takes as a critique — Lovelock has changed his position too often — is just what proves that Lovelock thinks inside the phenomenon whereas Tyrrell keeps heckling from the curbside.

To make you sensitive to the complete difference between sticking with a stale metaphor and thinking through the thick bushes of many contrary metaphors, here is Lovelock's prose taken not even from his scientific papers but from his popular books, especially the one most fraught with tricky figures of style, starting with its title, *The Practical Science of Planetary Medicine*. Even here, in the first pages of his book, he shows his mastery with thinking through hard linguistic material:

"I describe Gaia as a control system for the Earth - a self regulating system something like the familiar thermostat of a domestic iron or oven. I am an inventor. I find it easy to invent a self-regulating device by first imagining it as a mental picture. (...) In many ways Gaia, like an invention, is difficult to describe. The nearest I can reach is to say that Gaia is an evolving system, a system made up from all living things and their surface environment, the oceans, the atmosphere, and crustal rocks, the two parts tightly coupled and indivisible. It is an "emergent domain" - a system that has emerged from the reciprocal evolution of organisms and their environment over the eons of life on Earth. In this system, the self-regulation of climate and chemical composition are entirely automatic. Self-regulation emerges as the system evolves. No foresight, planning or teleology are involved." p. 11

See how he struggles? How he makes sure each metaphor is seen as such and counterpoising it, immediately, with another linguistic precaution? And he goes on, recognizing his past mistake and giving to Tyrrell a nice lesson on how science proceeds:

"At first we explained the Gaia hypothesis in words such as 'Life or the biosphere regulates or maintains the climate and the atmospheric composition at an optimum for itself'. This definition was imprecise, it is true; but neither Lynn Margulis nor I ever proposed that planetary self-regulation is purposeful. (...) In the argument over Gaia the metaphor not the science was attacked. Metaphor was seen as a pejorative, something inexact and therefore unscientific. In truth, real science is riddled with metaphor. (...)

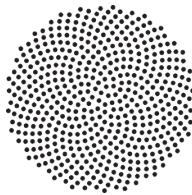


Even if in the end Gaia should turn out to be no more than a metaphor, it would still have been worth thinking of the as a living system. Such a model is fruitful: it has already led to many discoveries about the Earth that could not have come from conventional wisdom" p. 11 12

Here we have a fully reflexive attempt at including the difficulty of writing in the writing itself to avoid jumping where Tyrrell happily jump, that is to a second level, propped above the first level, that of struggling and thriving organisms, and where Evolution, Biochemistry, Gaia, Market, State, God, whatever the chosen personification, dominates, controls, and orders things top down.

And of course, fully aware of the positive and negative drifting powers of language, Lovelock don't hesitate to mix up registers, going from hypothesis-making to poetry, from addressing the readership to telling his own life, in a style that readers of Haraway will recognize as what has to be mobilized when **Gaia-Connectivity** is invoked:

""I ask you to concede there might be something in the Gaia theory. To acknowledge Gaia at least for the purpose of argument. I do not expect you to become converts to a new Earth religion. I do not ask you to suspend your common sense. All I do ask is that you consider Gaia theory as an alternative to the conventional wisdom that sees the Earth as a dead planet made of inanimate rocks, ocean and atmosphere, and merely inhabited by life. Consider it as a real system, comprising all of life and all of its environment tightly coupled so as to form a self regulating entity. (...) I am of course prejudiced in favor of Gaia and have filled my life for the past 25 years with the thought that the Earth might in certain ways be alive, not as the ancient saws her, as a sentient goddess with purpose and foresight, but more like a tree - a tree that exists, never moving except to sway in the wind, yet endlessly conversing with the sunlight and the soil. Using sunlight and nutrients to grow and change. But all done so imperceptibly that, to me, the old oak tree on the green is the same as it was when I was a child." p. 12



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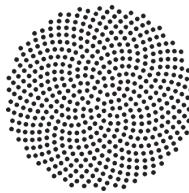
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In this constantly moving prose so as to educe the phenomenon that does not consider an organism and then its surroundings, we recognize the most important name given to Gaia, the one that is rightly put in the name of this conference, **Gaia-**

Thousand Names. As soon as we shift away from this extended pluralism, as Tyrrell so imprudently does, we evoke a figure of unity endowed with the theomorphic power of “molding creatures” from the outside. And it does not matter if it is Evolution capital E, or Life, capital L, or Gaia, capital G doing the molding. The whole has been shifted onto another plane than the parts. Exactly what Lovelock constantly counteracts, naturally with utmost difficulties, every time he notices the danger of invoking a figure that, to use my own vocabulary, smacks of the 2-Level Standpoint (by opposition to the 1-Level Standpoint, the “flat” or the “monadic” one that Actor Network Theory has been trying to extend throughout sociology).

If “Life is not at the tiller”, it’s because there is no tiller. As I have shown many times, it is exactly the same difficulty that you encounter in social theory, politics, physiology, planetary science, or physics. And the reason why it is so important to make oneself aware of this difficulty is that any attempt at invoking a controlling force in addition to what is controlled, carries with it the same political danger: at once, Gaia becomes another figure of historical necessity, **Gaia-The Irresistible Sense of History**, the one you might so conveniently invoke to condemn your enemies even before fighting them. A reinstatement of **Gaia-Dialectic Materialism** justifying in advance all the crimes the party vanguard is ready to commit “for the ultimate good of the whole”. We would suddenly be back to Hegel and Engels.

If I am so interested in Lovelock it is precisely, and somewhat paradoxically at first sight, because I recognize in his view (and that of Lynn Margulis) a powerful way to ensure that prematurely unified Whole does not take over biochemistry. That is, exactly the opposite of what Tyrrell argues against him. To be sure, Tyrrell knows infinitely more science than me, but I have tracked the conundrum of those two levels in more places than he and that’s, for now, the crux of the matter. Biology is so infused with spurious sociology

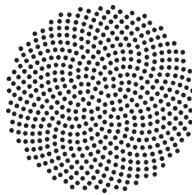


that I might give a hand at this point since the difficulty of sticking to one level is the same for the Body Politic as well as for the Body proper, or, in the present case, for Gaia.

There is no whole. More exactly, if there is a Whole, then, it is either the secular figure of a State to be composed, issues by issues, or the religious figure of a God of salvation, to be composed, act of charity after act of charity. But the telescoping of all the Wholes into Nature, Gaia, Evolution, Market, or even Commons, is a dangerous enterprise, what Eric Voegelin rightly saw as the definition of “Gnosticism”. And lumping all of them into a “system” does not clarify things further. At least, stop dragging politics into Nature, so that Nature can be first thoroughly decomposed and repoliticized in a compositionist way. (I am going too fast here just that you see where we are heading.)

So now let's consider the trick that Lovelock, in my reading of him, has devised to counteract the danger of composing the Whole too fast with another way to connect parts — and thus another way to define what it is for an organism to be a part. I have not read all of Lovelock, but I think his most common movement, as detectable in his prose, can be summarized as such:

step 1, choose an entity A to start with — a phenomenon like bacteria respiration, or crustal rock weathering; step 2, shift attention to its surroundings (precisely, as we shall see, what Tyrrell, intoxicated by selfish genes metaphor forbids himself to do); step 3, detect in those surroundings what transformation the entity A has induced; step 4, detect in those surroundings what transformation they have on A; step 5, compound the reciprocal effects by a gross use of the notion of negative or positive feedback, not because you believe there is a machine and an engineer (more of this later), but just to make sure the two are “closely coupled”; step 6, a tricky step, now, choose this ersatz of a feedback loop as the new starting point; step 7, start again so that “entity plus surroundings” are now replaced by loops interfering with other loops; step 8, the most important one in my view, anxiously revise the description so as to make sure the loops upon loops are not added to one another as if they were one Whole above the entities you



THE THOUSAND NAMES OF GAIA

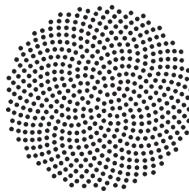
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started with. (This is why the terms “non additive” and “partially coherent” in Haraway’s definition quoted above are so important).

If you keep using such a trick, what will happen? The distinction between the inside and the outside of any given entity will be erased. Whatever else he might have done, such is, philosophically, Lovelock’s discovery. Darwin, whatever its infinite merits still considered organisms struggling inside an environment (and he had inherited more than his share of political theology). Not Lovelock. And such disappearance of the inside/outside boundary will come even more swiftly if you have the good fortune, as he did, of meeting Lynn Margulis who was practicing exactly the same move, not this time from an organism to its surroundings, but, so speak, in reverse order, by bringing inside the organism those other aliens who used to be part of its “environment”. This is why it is fair to name this move the Lovelock-Margulis decomposition of Earthly entities, and to give the title, suggested by Haraway, of **Gaia-Compost!**

But what is being decomposed so thoroughly? To get the point, it is useful, since it is so handy, to contrast it with Tyrrell’s move; although “move” is not the right word, since, precisely, nothing alive will come out of it: step 1, take an entity, that is, an organism in competition with others; step 2, calculate its fitness using the selfish gene accounting metaphor (while keeping Dawkins as the Ur-Accountant somewhere in the shadow); step 3, detect the fit with the environment; step 4, where the radical difference with Lovelock-Margulis move is the greatest: go from this calculation of fit to Evolution made to act upon the organism you started with (“molding” is the key term here); step 5, insist that the Evolution has no foresight, no goal and that the fit is actually not so good; step 6, use this argument of lack of fit to show that there is no other cause, such as “Gaia”, “molding” the organism in competition with Evolution; step 7, stop there (and I should add, to be really mean, feel good at having shown Lovelock wrong)... Stopping at step 7 is what deadens the prose.

The result of those two moves is that Lovelock’s planet is alive and Tyrrell’s planet is dead on arrival. It does mean that Lovelock introduces at some point a Life that would lift all organisms into a coherent whole, but exactly the opposite: he refuses to grant

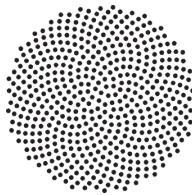


to any part the property of being the whole. While Tyrrell, just when he thinks he is destroying Lovelock's thesis, does indeed suddenly substitute to the multifarious actions of intertwined organisms some sort of spiritual force (well, he does not call it "spiritual", but it acts as a spirit and, as we know, when you write, action is everything). This spiritual force is that of Evolution which is accounting, literally accounting, for fitness. Lovelock's describe a planet alive because his prose is alive, meaning that any time you add an entity, even if it's a gas, a rock, a worm or a mat of microorganisms, it vibrates with all the historical specificity of the others agencies intertwined in it. Which is of course the effect of Margulis' prose as well even more literally in her case, since no organism has a self that is not shared with others. (By the way, this vibration is the source at which Haraway drinks from — to the point sometimes of inebriation!)

But Tyrrell, even when he piles life forms upon life forms, never manages to describe a lively planet because agency pertains exclusively to organisms having a self (a calculable fitness) and are simply part of Evolution molding them from the outside. "Alive" does not mean that at some point the spirit of the planet takes over by lifting all organisms and assembling them into a coherent whole, but that the enigma of who is acting when any entity acts has been distributed throughout the very multiplicity of organisms. This is why the old Greek epithet of **Gaia-Thousand Folds** might be the best title for what cannot be assembled. Let's add **Gaia-The Recalcitrant** or **Gaia-The Incomposable**.

The key difference, if we wish to drag Lovelock as well as Tyrrell probably much too far away from their field of expertise, is a definition of what it is to be the part of something. This is the tricky point of this lecture: the whole discussion around Gaia is in effect about the penetrability or impenetrability of the entities composing the Earth.

The official version is that organisms are impenetrable except, if I dare use this simile, by a causal force — it makes no difference if it is a "purely geochemical force" or "the force of evolution" since what counts in this description is first, the amount of activity granted to the entity or taken away from it, and second, how you manage to settle



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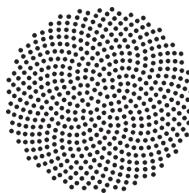
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the account (as is well known, the main anguish of “selfish genes” is to detect what the heck is the limit of their “self”). But if you begin to realize, as Lovelock has done, that the outside of any given entity (what used to be called its “environment”) is made of forces, actions, entities and ingredients that are flowing through the boundaries of the agent chosen as your departure point, how on Earth are you going to make the calculation of selfish interest and fit between “an organism” and “its environment”?

This is the point where most readers of Lovelock, scientists or humanists alike, misunderstand him: they believe that when he introduces Gaia, he introduces a **Live Planet** in addition or in supplement to the organisms and their environment, hence the “control” or “tiller” metaphor (to be fair, Lovelock many times does write this way, except he does not stick to it and makes this metaphor only one more crossed out layer in his argument). In effect, what he does is to deny that you may understand any organism on Earth by calculating its fitness as if it was “inhabiting” or lodged inside a hole upon which it has no influence and that does not act on it in return.

You might want to call it “co-evolution” but, as is the case with all those nice wishy-washy concepts, instead of solving the problem they give you back the same conundrums twice instead of one. The problem resides with the very notion of Evolution as a causal force molding organisms from behind, wrongly thought to be the only interpretation of Darwin. If the planet is said to be alive, it is to mean that there is no way to calculate the selfishness of an entity and stop at that or regress backward toward its overall cause. You have to move on forward and realize that a) the calculation is impossible, b) the attention has to be shifted to the coupling. That’s exactly what makes Lovelock’s mind, heart, research and prose move ahead.

Needless to say the difficulty here is enormous and the failure of sociology, theology and political philosophy to think through it does not bode well for biologists who have many other empirical tasks to fulfill than solving what social scientists have failed to resolve (and I am sure Tyrrell does an excellent job at that when he is not picking on



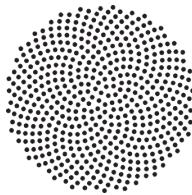
Lovelock). But let's try nonetheless for the remainder of this lecture to see what could protect Gaia from being a God of natural religion.

As soon as you say that organisms have no outside, the temptation is to say: "Ah, but I know this already: of course everything is connected with everything else. We should consider the real entity that is Life on Planet Earth taken as a Whole". And here, zillions of deep or superficial "ecological writings" render the temptation even more irresistible. That has been Lovelock's bane: if you move one step aside the path, you slide straight through another Gaia altogether, **Gaia-Spirit of the Planet**. In effect you have shifted from the exploration of **Gaia No-God** to another instantiation of political religion. Although the gap between the two is radical, it's almost indiscernible to the modernist mind set of those who have no alternative to the individual but that of what I call The Great Dispatcher — in the two versions offered by the three-century religious war Moderns have waged on the planet, namely the Market and the State.

If you stick to the individual versus society paradigm (the 2 Level Standpoint) you are stuck. But how can you extirpate yourself to follow action through intertwined organisms by sticking relentlessly to the 1-Level Standpoint?

Strangely enough, those who criticize Lovelock so much for "projecting spurious life form unto the planet", are actually using quite liberally a template that does connect all entities into one single movement that is not a whole added to them. If you adopt a Laplacian world-view, you will have no difficulty in proclaiming, too, that "everything is connected" since the causal forces penetrates all entities and sum them up in one single flow of action. So in the most positivist and reductionist scientific worldview, there is actually at work a powerful way of negating the impenetrability of all the agents. I believe that this is the source of Lovelock's innovation.

People too often forget that he is first a straight engineer and a fully positivistic thinker without, at first, any strange fancy element added to the canonical template: causes fully penetrate their consequences. But what he has noticed is a strange limit in his colleagues' theories: if you use such a template, why is it that you add to it a



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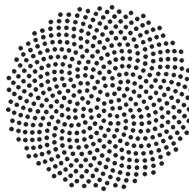
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supplementary argument whereby individual agents are stuck inside an environment? If entities are penetrable by outside causality — as in the straight Laplacian template — why is it that you stop inquiring about the many other form of influences that you detect along the way?

Contrary to the official view of Lovelock, he is not a chemist suddenly converted into a philosopher, a spiritualist ecologist or the guru of some religion. He remains a totally naïve believer in mechanical philosophy. But he has detected that his geologist, climatologists and biochemist colleagues had thwarted for no good reason the description of what they had in full view, namely that at every point where outside causality was supposing to act alone, lots of other agencies were acting just as well. It is in that sense that Lovelock engineering training offers a lesson to mechanical philosophy. An engineer is more than happy to grant action to every part along the causal chains he is composing. (And it is not for nothing that he prides himself for having been an independent researcher for most of this career. Independence is the key.)

To make my point clear, let's say that it took an engineer to break down the silly engineering metaphor that had limited the inquiry of his scientific colleagues. The scientists he is struggling against believe you can have penetrability of agents on the one hand, and then, stick nonetheless to the idea of an agent plus an environment, whereas Lovelock frees their science by extending the mechanistic world-view and distributes agencies at every point along the causal chains. Read in this way, Lovelock, far from "fighting reductionism" has unlocked the explanatory power of reductionism. It is just that no organism can be reduced to one's own action! To be fully reductionist, you need to follow through all the other actions that are complicit in its action. In that sense Lovelock is as far as possible from any "holistic" thought. Engineers cannot be fooled by the Myth of the Machine. Gaia, for Lovelock, could be called **No Machine** and that's why, of all the metaphor he criticizes, none is damned more relentlessly than **Space-Ship Earth**.

Why is this argument not easy detectable? Well, I think the answer is not difficult to find. Once again Tyrrell, because of its coherent way of being deaf to what Lovelock attempts to do, is illuminating: the obsession for selfish genes, that is for the neo-

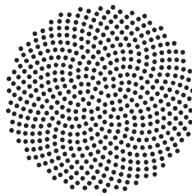


liberal theory of action parading as biology, makes impossible to fully follow Lovelock's reductionist call. When you really believe that externalities — to locate this philosophy of biology where it pertains: namely economics —, cannot be internalized by selfish individual agents, how could you possibly understand what it is to be a lichen, a worm, a bacteria, a gas, a climate, a coral reef or a cow's rumen? Impenetrable agents, able to calculate their interest and externalize the rest, are not biological creatures, but an invention of a long line that includes Locke, Smith, Spencer, transmogrified through three centuries of intermingling with political philosophy, into the only inhabitants of planet Earth. When you take Richard Dawkins for a biologist, no wonder that you might misrepresent Lovelock for a mystic!

There is actually in Tyrrell's book a very revealing passage when he criticizes the Daisy Model that Lovelock had devised so as to answer the neo-Darwinian argument brought against his Gaia theory. Lovelock was very proud of this little toy because, in his view, it showed that he was not imputing any Dispatcher to rule, control, order and lord over the struggling daisies. Tyrrell recognizes this and adds an interesting retort to the model, a retort that, in his view, voids Lovelock's counter argument.

"In helping itself, a daisy automatically also improves the global environment. In Daisyworld the two go hand in hand. Whenever a daisy improves the global environment it also improves its personal environment. When this key assumption is removed, temperature regulation no longer emerges from the Daisyworld model" p. 27

We recognize here, in the clearest fashion, the old conundrum of the tragedy of the commons, transported into political philosophy of biology. Now this is really extraordinary because what Lovelock does is exactly not to "remove the assumption" since externalities and internalities can no longer be easily distinguished. That's his discovery. Who are those who "remove the assumption" for no clear reason coming from the study of organisms? They are Lovelock's neo-liberal objectors who populate the world (social and biological) with nothing but selfish agents and let the externalities take care of themselves. Quite naturally, since they are at war with the Whole — conceived as a State, or as Gaia — they cannot even conceive that there is any other way to connect the agents — exactly



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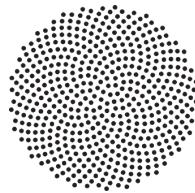
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what Lovelock explores through his beloved (and admittedly highly simplistic) Daisy Model. This resurrection of the whole cosmology of the Commons, a cosmology I stress it again, that is not the least holistic is entirely lost on Tyrrell. But it is what excites everybody else about **Gaia the Uncommon-Commons**.

It is for future historians of science to explain why it is that an inventor, fully unaware of political philosophy and sticking to a completely reductionist view of science, has been put into resonance with what I take as a thorough critique of the neo-liberal version of neo-Darwinism. I have no answer to that. But that he had found, very early on, the right enemy (Dawkins being a symbol of this kidnapping of biology by British economics) will certainly be seen later a key moment of our recent history. There is a great irony here (an irony reverberating throughout Tyrrell's book) that those who have so thoroughly miscalculated the action of human agents on the Planet gives lessons of scientific method to the one theory that has ruined in advance their pseudo-scientific arguments. Is this not extraordinary? A neo-liberal view of selfish calculation, utterly unable to account for the internalization of something so massive as a change of climate, nonetheless claim adamantly that you should stick to this accounting mechanism to fathom the intricate existence of all earthly beings? They are not even able to calculate the devastating balance of something as simple as what extractive industries do, except by leaving outside all the unintended effects of such an enterprise, and they have the nerve of claiming that they know where to stop when calculating the fitness of an earthworm? They try to condemn in advance any attempt at moving attention away from selfish individual under the pretext that it would amount to drifting to a fanciful God of the Earth, while they had left, for the last three centuries, the whole set of unwanted effects their own action entails to the Great Outside in the false belief that it could be the best of all Optima? Well, today, as Lovelock says, Gaia takes its revenge. Let me close with this last epithet **Gaia-The-Vengeful**.

As Margulis so aptly said:

"Our self-inflated moral imperative to guide a wayward Earth or heal our sick planet is evidence of our immense capacity for self-delusion. Rather we need to protect us from ourselves" p. 115



OS MIL NOMES DE GAIA

do Antropoceno à Idade da Terra

Let ask this Gaia not to protect us but to save us from taking her as a God.