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

« Why Gaia is not a God of Totality » ***Theory, Culture and Society,***
special issue on Geosocial Formations and the Anthropocene,
Volume 34 Numbers 2–3 March–May 2017, pp.61-82
Check the journal for the final version of the text

Bruno Latour, Sciences Po

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***, as this conference is titled, 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 managed around 35 out of one thousand!).

I have to confess I have now a pretty devious habit: when I meet a *geo*logist, a *geo*grapher, a *geo*chemist, or some expert in *geo*politics, 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 G*aia*logist, a G*aia*grapher, a G*aia*chemist, or someone deeply involved in G*aia*politics". And then I observe with some amusement how they react to this falsely innocent change in the prefix. After all, *geo-* and G*aia* share exactly the same etymology, both come from the same entity Gè, actually a chtonic divinity much older than Olympian gods and goddesses, the primitive power who is sometimes addressed with the very apt epithet of **Thousand Folds**. The reactions of the scientists thus addressed are

[*] Written for the Rio de Janeiro meeting The Thousand Names of Gaia, September 2014.

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 need of being stressed that they work on Gaia ("yes of course, I have devoted my whole 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 has 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 other of its titles, **Gaia-Enigma** or, to give her the epithet Isabelle Stengers has popularized **Gaia-The Intruder**.

This 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 *geo*sciences and for staging the usual drama of *geo*politics, has now 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 loud crashing of outside/inside boundaries. 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 "Geo" is stale, the prefix "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 into 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 you 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.[1]

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 "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, if it's instructive, well written and politically relevant, why pick on this book in particular? Well, because there exist

[1] Tyrrell, T. 2013. *On Gaia. A Critical Investigation of the Relationship between Life and Earth*, Princeton, Princeton University Press.

books which are 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 the point so relentlessly… That's the case with Tyrrell's attempt. I have rarely read such an "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 to render its discipline "strictly scientific". The whole book is framed as a set of long, smug, and condescending lessons of scientific method in order to castigate poor old outdated Lovelock. A set of lessons that:

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

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

third) in the end accepts as obvious most of what Lovelock and Margulis had fought so long to make people understand: namely that you can no longer distinguish between organisms and their environments but without drawing from this the political consequences.

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 **Not Dead Planet** and that would have been sufficient, in my view, to vindicate most of Margulis and Lovelock's

enterprise. (By the way how do you say "Not Dead" when in the 70s you are fighting 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 are Mars or Venus).

Anyway, Tyrrell honestly 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's 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, quoting Haraway again, as the discovery of:

> *"complex non-linear couplings between processes that compose and sustain entwined but **non additive** subsystems as a **partially** coherent whole"* [2]

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

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

[2] Haraway, D. 2014. Staying with the Trouble. Sympoiesis, String Figures, Multispecies Muddles. *In*: Stengers, I. (ed.) *Speculative Gestures.*

ritual indeed which would be nice to extend for some future 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—as 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 himself to be fair and balanced in his clear-headed assessment of Lovelock, even as he is attributing to Lovelock's Gaia a *theomorphic* position Lovelock never held — and, as we shall see, a position that Lovelock is probably the first to have so thoroughly dismantled. To impute to Lovelock his fanciful Gaia, Tyrrell uses a vocabulary 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 imagines 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, in turn, have borrowed them off the shelf from theology.

And such a fanciful view of Gaia is repeated in 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 not have been anything "daring and provocative" 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 transforms Gaia into some figure of the Optimum, a strange mixture of Market and State theology — the word "regulation" being a favorite target 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-Ur-Kontrollstelle**. 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 more that is even better. Since the whole argument has become a theological one – Gaia *should protect life* everywhere as a sort of **Gaia-Pro-Life** activist – there comes a point when this divinity is accused of *not* doing the optimal good it should. Then, the question is supposed to be 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 Lovelocks'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).*

No "safety net"? Really? It seems that 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, 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 endeavors to prove through a great wealth of data that Gaia is not a well-ordered, well-regulated 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 confortable." p. 48.*

Which is exactly the opposition between organisms and environment that Lovelock had put to rest. On Lovelock's Earth no one is any longer in a position to "mold" anybody else. And 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 arguments 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 citizens in a usable form? Is She supposed to be like Yahweh in the desert caring for his elected People by providing manna?

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 Briton steeped in the religion of individual selfish genes has learned to debunk.

And now be prepared for the final stroke, where in chapter 9 Tyrrell can triumphally state:

> "*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 designate, in the end, 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 Tyrrell's critique is so irrelevant to the figures of Gaia that interest us. Who needs to have another proof of the 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 of how far the tropism of language sets them to 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 as a complete surprise to him.

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 that 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? But there are 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 and non-holistic 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 fashioned those summaries into a totally irrelevant argument against a Providential **God of the Earth**, before issuing, 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 right 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. [3] But the problem is that this is not at all the topic that was introduced by Lovelock's Gaia. Inheriting from the Devil is not the question.

Now I am sure you will say that I have been unfair to poor Tyrrell and that Lovelock did talk about a thermostat, about making the Earth comfortable for life etc. But there is a big

[3] Ward, P. D. 2009. *The Medea Hypothesis: Is Life on Earth Ultimately Self-Destructive?*, Princeton, Princeton University Press.

difference, a difference that shows the huge gap between a scientist who sticks to one genre that he or she believes is the "scientific worldview" (a view that is, most of the time, a set of clichés taken as literal description) and a scientist who thinks through and *against* the clichés to explore a new description of a state of affairs. The big difference is this: while the first sticks 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 taken as a "scientific concept"), the second ceaselessly *modifies* his or her metaphor. What Tyrrell 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 underbrush 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***.[4] 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*

[4] Lovelock, J. 2000. *Gaia. The Practical Science of Planetary Medicine*, ?, Gaia Books Limited.

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 Earth 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 jumps, that is to a second level, floating 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, well 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 of 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*

Here is prose that constantly moves so as to educe the phenomenon in a way that does *not* consider an organism *and then* its surroundings; in it 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. You might appear to speak about "natural material objects" but you have already given them a shape that has been imposed by a particularly devious form of political theology. And this is why 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).[5]

---

[5] Latour, B., Jensen, P., Venturini, T., Grauwin, S. & Boullier, D. 2012. 'The Whole is Always Smaller Than Its Parts' A Digital Test of Gabriel Tarde's Monads (in press). *British Journal of Sociology*, 63, 591-615.

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: **Gaia-Spirit of the Earth.**

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 a prematurely unified Whole does not take over the definition of what organisms are up to. *Connectivity without holism*. That is, exactly the opposite of what Tyrrell argues against him. To be sure, Tyrrell knows infinitely more science than I, 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. [6]

There is no whole. More exactly, if there is a Whole then it is either the *secular* figure of a State to be composed, issue by issue, 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".[7] And lumping all of them into a

---

[6] Latour, B. 2005. *Reassembling the Social. An Introduction to Actor-Network Theory*, Oxford, Oxford University Press.

[7] Voegelin, E. 2000. *The Collected Works of Eric Voegelin. Volume 5: The Political Religions, The New Science of Politics, and Science, Poltiics and Gnosticism (edited by Manfred*

"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 but this is so 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 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, in spite of his infinite merits, still considered organisms struggling inside an environment (and he

---

Henningsen), Columbia and London, The University of Missouri Press.

had inherited more than his share of political theology…). Not Lovelock. And such disappearance of the inside/outside boundary would come even more swiftly if you could have the good fortune, as he did, of meeting Lynn Margulis. She 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 Lovelock's move with Tyrrell's (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)… It is stopping at step 7 that deadens the prose.

The result of those two series of moves is that Lovelock's planet is alive and Tyrrell's planet is dead on arrival. It does not 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 for 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 describes a planet that is 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 other 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 from which Haraway drinks).

But Tyrrell, even when he piles life forms upon life forms, never manages to describe a lively planet because he grants agency *exclusively* to organisms having a bounded self (a calculable fitness) and then to Evolution transformed into a force 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 or that some animism is extended to every entity, 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 fields of expertise, is a definition of what it is to be *the part* of something else. 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 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. This would be the point where connectivity drifts into holistic thought. (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 whole 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 problems they give you back the same conundrums twice instead of once. The conundrum 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. It does not mean that you have to embrace animism but that you try to detect where the idea of *inanimism* has come from. You have to move on forward and realize that a) the calculation is impossible, and 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. Which does not mean that we wish religion out of the picture, on the contrary, but simply that we don't want religious views of the providential God of Totality to be dragged into an apparent discussion about "material objects". And the danger is very real because of the obligatory shift to holism.

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*" (at which point some ample gestures of the two hands would fit well). 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 off the path, you slide straight into 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 which 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 connects all entities into one single movement while avoiding fairly well the addition of a whole floating over them. If you adopt a Laplacian world-view, you will have no difficulty in proclaiming, too, that "everything is connected" since the causal forces penetrate 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 on engineer and a fully positivistic thinker without, originally, 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 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 forms 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 and his politics is equally naïve and often counterproductive. But he has detected that his geologist, climatologist and biochemist colleagues have thwarted for no good reason the description of what they had in full view, namely that at every point where outside causality was supposed to act alone, lots of *other agencies* were acting just as well. It is in that sense that Lovelock's 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 and autonomy, for him as well as for the entities he cares for, are the keys.)

To make my point clear, let's say that it took an engineer to break down the naive machinistic 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 *distributing* 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 its own

action! To be fully reductionist, you need to follow through 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 metaphors he criticizes, none is damned more relentlessly that **Space-Ship Earth**.

In that sense, he is very close to another of my heroes, Pasteur, who had the obstinacy, because he was a straight reductionist chemist, to break simultaneously the holistic thought of the hygienists (the ecologists of his time) and the too limited mechanical philosophy of the chemists (the geologists of his time) who were all denying the agency of Pasteur's yeasts and microbes. In history of science, we should always distinguish those able to extend reductionism further by adding new agents at work — the microbes in the case of Pasteur — and those content to believe in an interrupted reductionism, defined at each successive time as the ultimate "scientific world view".[8]

Why is this argument not easily detectable? Well, I think the answer is not difficult to find. Once again Tyrrell, because of his coherent way of being deaf to what Lovelock attempts to do, is illuminating: the obsession with selfish genes, that is, for the neo-liberal theory of action parading as biology, makes it 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.

[8] Latour, B. 1988. *The Pasteurization of France (ranslated by Cathy Porter)*, Cambridge Mass., Harvard University Press.

When you take Richard Dawkins for a biologist, no wonder that you might misrepresent Lovelock as 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 **Great 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 *precisely not* to "remove the assumption" since, for him, externalities and internalities can no longer be easily distinguished. That's his discovery. It is certainly not the empirical evidence that allows one to "remove the assumption".[9]

If it is removed, it is because Lovelock's neo-liberal objectors populate the world (social and biological) with nothing but selfish

---

[9] The connection between biology, social science, politics and economics is shown even more vividly when you realize that the same problem is articulated much in the same way in the negotiation over "world" climate as in this quote from the New York Times: "First, greenhouse gases **mix globally** in the atmosphere, and so damages are spread around the world, regardless of where the gases were emitted. Thus, any country taking action **incurs the costs**, but the benefits are **distributed globally**. This presents a **classic free-rider** problem: It is in the economic self-interest of virtually no country to take unilateral action, and each can reap the benefits of any countries that do act. This is why international cooperation is essential." Robert Stavins, NYT, 21-09-14.

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 what Lovelock explores through his beloved (and admittedly highly simplistic) Daisy Model. If the selfish versus environment paradigm is so difficult to counteract, it is because every time you doubt the limit of the "selfish" entity, you will be *accused* of resorting to a providential definition of the Whole ("group selection" in sociobiological jargon).

Such a trope was invented in the 18th century to transform bees and ants into budding little capitalists and to make sure, whenever the eminent virtues of individualism triggered skepticism, that you could accuse the skeptic of longing for State intervention or a Providential God of Mercy. It is the possibility of such an accusation that defines, most precisely, what is often called "*capitalocene*" and which is in effect an accounting system, a legal definition of property rights and a way to preempt any counterattack. It's amazing to see such a trope still acting in an officially biological discussion of climate and organisms.

This is why Tyrrell's blindness is so interesting: he is so imbued with the individual versus society model, that Lovelock exploration of the cosmology of the Commons — a cosmology that is not, I must stress it again, the least holistic — is entirely lost on him. But it is what might exercise everybody else about what could be called **Gaia the Uncommon-Commons**.

It is for future historians of science to explain why it is that an inventor such as James Lovelock, 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 crossed swords, very early on, with the obvious enemy (Richard Dawkins being a symbol of this kidnapping of biology by British economization[10]) will certainly be seen later as a key moment of our recent history.

---

[10] Latour, B. & Strum, S. 1986. Human Social Origins. Please Tell Us Another Origin

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 presume to give lessons on scientific method to the advocate of 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 claims 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 to claim 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 individuals under the pretext that it would amount to drifting to a fanciful God of the Earth, while they have left to the Great Outside (as others have for the last three centuries) the whole set of unwanted effects their own actions entail 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 then with this last epithet **Gaia-The-Vengeful**. As Margulis so aptly said:[11]

> *"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

And the first thing to do, so as "to protect us from ourselves", is not to take Gaia as a God of Totality. There might be other gods, other totalities, other compositions, or rather "composts", but the patterns out of which they are to be shaped should not be cut out from such an old fabric.

---

story! *Journal of Biological and Social Structures*, 9, 169-187.

[11] Margulis, L. 1998. *Symbiotic Planet. A New Look at Evolution*, New York, Basic Books.