

BETWEEN HERMES, GAIA AND APOLLO 8: MICHEL SERRES AND THE PHILOSOPHY OF SCIENCE AS COMMUNICATION

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One of Michel Serres' major concerns is the social and environmental consequences of the late twentieth century ascendancy of science over the humanities. Serres' response to the emergence of this ascendancy is conceived in both his sustained interdisciplinarity as a writer and his ontological model of intersections, interrelations and complexity. Like Deleuze, Serres uses the tempo-spatial model of the fold as a means to comprehend complexity, and he envisages the classical figure of Hermes, winged god of messages and communication, as a trope of the task of philosophy. This article seeks to assess the contemporary relevance of the philosophy of Michel Serres, and in particular his view that the primary task of philosophy is communication.

Hermes is the one who invented the nine-stringed lyre. What is a musical instrument if not a table on which one can compose a thousand languages, and as many melodies and chants? Its invention opens the way for an infinite number of inventions. This is good philosophy in action, whose excellent goal is to invent the transcendental space, the conditions, for possible inventions of the future. The Invention of Possible Inventions. (Serres, 1995: 117)

As the likely potential consequences of climate change gradually emerge in public consciousness, so reference to complexity theory has become more frequent in the vernacular and in everyday imagery. The well-known image of the butterfly, for example, fluttering its wings in the Amazonian jungle in a chain of indiscernible connections into a wild hurricane on the other side of the world, may be a limited analogy of complexity theory. Yet as a cultural configuration this 'butterfly effect' is sufficiently familiar to serve as a kind of shorthand for the notion that complexity, along with invisible networks of communication and unpredictable outcomes, have acquired a central role in the common cultural currency of our age.

It is in this context in which the work of Michel Serres will be discussed. Serres, like Nietzsche, reconfigures the Greek gods as innovative tropes of philosophy, and uses them tactically to traverse the sheer complexity of contemporary networks of communication in order to return to fundamental questions of political agency. For Serres, such agency is unalterably tied by its relations with the non-human world, and in particular the question of immanent global environmental crisis.

The new science of complexity, unlike regimes of largely mechanistic and linear science that arose in the seventeenth century, has been related to a number of previously discrete fields:

from computational information theory, to microbiology, neuroscience and earth systems science, along with social formations such as economics and the adaptive systems of public organisations and institutions. It is, moreover, not unusual for a complexity theorist to shift across traditional disciplinary boundaries when discussing the way complexity works.¹

So in a globalised age of mass communication, the general image of a non-human world that incorporates highly complex relations is arguably gaining greater currency. It has extended to a more general questioning of human relations with the non-human world and the effects of androgenic causes within the complex dynamics of climate change.

In recent public debates on earth systems science, for example,² theories of complex, adaptive systems no longer pertain exclusively to the revaluation of physical global systems in what James Lovelock (1979) referred to as the Gaia hypothesis, but are extended to the consideration of long term histories of how human societies impact on the biosphere. That is to say, the complex processes of human interdependence with the non-human world have, by necessity, been brought to the centre of the question of the androgenic causes of environmental degradation and escalating loss of bio-diversity. These complex global patterns became more culturally accessible at a time when cold-war rhetoric had thawed to the point at which, at the grass-roots level, it was thought that political agency and a collective will to avert global crisis was more immediate than had previously been felt in the post war era of aggressive nuclear proliferation, which ended with the demolition of the Berlin wall in 1989 and the dissolution of the Soviet Union in 1991. Yet, increasingly through the nineties, alternative images proliferated in the public sphere via media representations of ecological decay as manifestations of the unforeseen consequences arising from the human mastery of nature. It is into the proliferating web of such largely unintended outcomes that Serres introduces the figure of Hermes: the ancient guide to impassable boundaries, and vast vortices of complexity.

Hermes

For most of his life, Michel Serres has worked in the modern university system. As an academic in one discipline, that is, in mathematics,³ while also thinking in others, such as philosophy, poetry or history,⁴ Serres has spoken of the loneliness of his love for the liminal interstices of interdisciplinarity. It was this everyday contact with conventional disciplinary segmentation that prompted Serres' turn to Hermes not only as winged emissary of models of complexity as the bedrock of his ontology, but also of his stubborn resistance to the deeper traditional barriers between science and the arts. Serres' exposure to the conventional epistemological distinctions drawn between cultural and scientific knowledge processes led him to see them as but one part of a pervasive spatial order extending far beyond the academy. That is, extending into the economic and territorial demarcation of the earth, into science in the service of militarism, and the threatening spectre of war that had followed him from his youth during the Second World War and the occupation of France. The atomic bombs that destroyed Hiroshima and Nagasaki were, in particular, one of the consequences of scientific progress that Serres remarked has cast long shadows over the rest of his life, to the extent that he could say, "I ask my readers to hear the explosion of this problem in every page of my books. Hiroshima remains the sole object of my philosophy" (Serres & Latour, 1995: 15).

It is then, into a human world capable of utter self-destruction that Serres calls on Hermes, son of *Zeus* and *Maia* (a goddess of clouds, and one of the stars of the Pleiades). Hermes was from the outset a brilliant, indeed, mercurial trickster. Historically, he was born in Arcadia, which is to say, the actual Arcadia in the centre of the Peloponnese, which according to Eisenberg was still a lush landscape in the age of Virgil, and the site of the oldest cult of Hermes (Eisenberg, 1998: 165). His phallic stone images marked out territorial claims, but as a powerful god of boundaries, he could transgress and traverse them all with great speed and agility, and as the inventor of the lyre (crafted from the bodies of animals) was the god who brought the divine harmony of music to the fields and woodlands of the old Greek world.

As a mischievous god of speed, flexibility and skill, Hermes was also known as the patron god of thieves in the ancient Mediterranean world, thieves who knew that even as a baby the famous Hermes had managed to trick Apollo, solar god of reason and light, and steal his whole herd of cattle. Apollo, at first enraged by Hermes theft, found his rage assuaged by Hermes' musical gifts, and when given the lyre by Hermes, Apollo, now himself the god of music, rewarded Hermes with his golden staff or *caduceus*, and the gift of prophecy. This was a gift that, as we shall see, was first given to Apollo by Gaia, mother of the earth. Hence in this account of Greek mythological genealogy, the voice of prophecy is passed from the earth to the solar god of reason, hence through music, art and complex lineages of communication, only to return in its contemporary reconfiguration at least, as a song of the earth, the most ancient of them all. It is this song Serres intends us to recall. It is a song that in the contemporary age we forget at our mortal peril as a sign of the time when the world itself could be consigned to a perpetual underworld.

As Hermes grew older, Zeus saw that his brilliant son should be assigned important tasks, so as god of thieves he was elevated to become the deity of commerce, to communications and messenger of the gods, but also messenger to *Hades*. It was in this role, as *Hermes Psychopomp* that he acted as a guide to human souls, leading the dead past the disorienting *aporia* of the River Styx, into the dim passages of the underworld.

It is Hermes then that is Serres' source of inspiration, a figure of mercurial transformation shifting according to which particular point of inter-disciplinary connection arises in Serres' writing, but also generally traversing most of his works in one form or another. It is with reference to the pervasive presence of Hermes across his works as a whole that in the (best-selling) published dialogue between Serres and Bruno Latour *Conversations on Science, Culture and Time*, Serres tells Latour (1995: 114):

Hermes, by renewing himself becomes continuously our new god, for as long as we've been humans – not only the god of our ideas and our behavior, of our theoretical abstractions, but also the god of our works, of our technology, of our experiments, of our experimental sciences. Indeed, he is the god of our laboratories, where, as you have pointed out, everything functions through networks of complex relations between messages and people. He is the god of our biology, which describes messages transmitted by the central nervous system or by genetics. He is the god of computer science, of rapid finance and volatile money, of commerce, of information, of the media's which produce a third reality, independent of the one we

hold as real. He's the god of the rapports between the law and science. In short, suddenly here I am in Big Science, which is itself immersed in contemporary conditions and is immersing those conditions in itself – that Big Science you just reproached me for not addressing. As far as I can tell, you are trying, as I am to construct a philosophy that is compatible with this new world. Not in order to imitate it, nor to justify it, but in order to understand it, and desperately, perhaps, to know how – to be able – to direct its course. For the first time in history we think it really depends on us.

This then, is not just a god of everyday life, but also one who governs the kind of philosophy that can address the contemporary relations between culture, “Big Science” and the law, as a divinely inspired triad with the capacity to change the course of history. Apart from his two-volume study of Leibniz's seventeenth century mathematical and philosophical models published in 1968, much of Serres' early work of the 1960s and 1970s is collected in five volumes of essays entitled *Hermès* (1968). In the first of these, *La Communication*, Hermes makes his very first appearance as *The Apparition of Hermes: Dom Juan* (an essay on Molière). In this rather strange comparison of the mythological figures of Hermes and Dom Juan, Serres is less concerned with Dom Juan as a fickle womaniser than he is with his subversive view of money and the economics of modernity. Which is to say, this is a Dom Juan who subverts not only the conventions of exchange in love, but also in economic discourse and financial transactions – a comic transgressor of the official modern values of exchange, who in flouting the rules becomes for Serres, “The hero of modernity” who “designates contemporary society as a tribe of primitives” (Serres, 1982: 12). The primitive modes of symbolic exchange highlighted in Marcel Mauss's *The Gift* (published a year earlier in 1967) informs Serres' account of Molière, especially Mauss's account of indigenous North American rituals, but it is the more familiar European *Théâtre Français* and Greek god of circulation and tricksters that opens Serres' conduit to symbolic exchange. Hence Hermes, himself an embodiment of the processes of exchange, appears in a flash as a *personification* of the social impact of modern symbolic exchange: an image as immediately accessible as a comic book hero, yet one ushering the possibility of philosophical reflection.

Mauss's account, as Serres sees it, seems like an unnecessarily anthropological diversion in assessing the symbolic exchanges of Western modernity as essentially primitive. It is nonetheless typical of Serres, as it was for Leibniz, to explore lines of *continuity* with other texts, and other possible worlds, and it is this preference for building lateral, and not necessarily sequential relations, rather than the grand gesture of radical Cartesian doubt, that leads him to ask rather paradoxically, “But could we ever had read Molière without Mauss?” (1982: 13).

At any rate, perhaps because (after completing his first two degrees in mathematics) Serres' third degree was in classics, it is the Greek Hermes who enables his sense of the comic, the Apollonian vision, and divine laughter as the starting point of his five-volume project exploring the relations between culture and science.

Nietzsche said of Dionysus that he was the father of Tragedy and described the explosion of the principle of individuation to the ecstatic delirium of wine. Must it be said of Hermes, the god of commerce, that he is the father of Comedy ... Is he the god of the crossroads, of thieves and of secrets, this god sculpted on milestones and

adorned with such conspicuous virile organs who, like Psychopomp, accompanies Don Juan to Hell? Laughter is the human phenomenon of communication ... it is inextinguishable at the table of the gods. (1982: 13–14)

This then, is Serres' heroic image of Hermes as a figuration of modern social, economic and libidinal relations, and deity of the conduits of knowledge that produce those relations. It is philosophy as comic theatre, engaging the reader in familiar stories then twisting them as investigations of the complex invisible forces shaping our lives.

The essays in the *Hermès* volumes form a series of connections in themselves, a non-linear and often non-sequential collection of meeting points between a wide range of disciplines: science, philosophy, literature, mythology, art, popular culture and not least, the topology of the natural world. Each point of relation works like a crossroads, where, as it were, encountering Hermes, Serres moves off with great speed to a new point of connection. There is something particularly French about the discursive, analogic and non-linear form of writing that can have the effect of *mercurial* flux in the mind of the reader. And it is clear from Latour's comments in his published conversations with Serres that his work is popularly regarded as difficult in France. Latour's questions require Serres to give an overview of his approach, and while this does not always happen, he does provide an account of some of the tasks he set himself with various texts.

There is of course a certain measure of irony to the fact that, for a thinker who regards passages of communication as a central task of philosophy, it was a series of interviews, *eclaircissements* (clarifications) as they were called, that remained on the French best-seller list for several weeks. Yet in the context of the political and environmental consequences of the deep boundaries between science and other forms of discourse, communication with the wider reading public may not necessarily constitute Serres' primary task of communication, aiming instead for the networks sustaining disciplinary and territorial boundaries themselves, particularly as Latour suggests, those of Big Science.

Serres is in turn inspiring, irritating, and amusing, and requires of the reader either a wide reading in diverse fields, or more to the point in terms of his literary stratagem, a willingness to follow curiosity down hitherto unexplored passages of understanding. If, moreover, the common reader gets lost in the labyrinth, this is probably less likely than the experience of exclusion encountered by non-specialists when attempting to comprehend techno-scientific information. Compounding Serres' departure from more ordered forms of argumentation, his multiple points of connection do not typically conform to a linear model of time or traditional models of space, and most turn on the recurring trope of the fold as a metaphor for temporal and spatial complexity.

Serres, like Deleuze, sees much in Leibniz' seventeenth century concept of monadology as a basis for a contemporary model of time and space as a continuous tempo-spatial dynamic and elastic topology of matter, which Deleuze (1993:6) describes as:

A flexible or an elastic body still has cohering parts that form a fold, such that they are not separated into parts of parts, but are rather divided to infinity in smaller and smaller folds that always retain a certain cohesion.

In this account, time, rather than a unidirectional linear sequence, is a ductile, continuous process that folds over and over within itself. Time, Serres observed, “can be schematized by a kind of crumpling, a multiple, foldable diversity” (1995: 59). Hence the past is no longer frozen, no longer, as it were, out of date, but makes its appearance in the present. This is often difficult for us to see given the way our view of the world is shaped by a linear sense of progress of which Serres (1995: 48) remarks:

Let me say a word on the idea of progress. We conceive of time as an irreversible line, whether interrupted or continuous, of acquisitions and inventions. We go from generalizations to discoveries, leaving behind us a trail of errors finally corrected – like a cloud of ink from a squid But, irresistibly, I cannot help thinking that this idea is the equivalent of those ancient diagrams we laugh at today, which place the earth at the centre of everything, or our galaxy at the centre of the universe, to satisfy our narcissism. Just as in space we situate ourselves at the center, at the navel of things in the universe, so for a time, through progress, we never cease to be at the summit, on the cutting edge, at the state-of-the-art development. It follows that we are always right, for the simple, banal, and naïve reason that we are living in the present moment.

Passages to the past made visible by the *folds* of the present enabled Serres to find “modern” concepts of fluid mechanics, turbulence and chaos in Lucretius’s poetic treatise on physics *De Rerum Natura*, especially his concept of the *klinamen*, a very slight declination or inclination, or tiny variation in atomic matter which sets up a chain reaction leading to turbulence (1982a: 103), a concept anticipating modern chaos and complexity theory, a concept of the ‘butterfly effect’ originating in classical antiquity.

Because time is folded, Lucretius, like Leibniz or Hermes can open passages to knowledge in the present. Indeed, philosophy as communication and a more focused *hermeneutics* of the everyday, Serres seems to suggest, will reveal multiple genealogies of history even in the most banal objects:

What things are contemporary? Consider a late-model car. It is a disparate aggregate of scientific and technical solutions dating from different periods. One can date it component by component: this part was invented at the turn of the century, another ten years ago, and Carnot’s cycle is almost two hundred years old. Not to mention that the wheel dates back to Neolithic times. The ensemble is only contemporary by assemblage, by its design, its finish, sometimes only by the slickness of the advertising surrounding it. (1995: 45)

Epistemological themes were developed further in Serres’ books of the eighties, such as *The Parasite* (1980), which examined patterns of human and non-human interdependency explored as mutual parasitism, and in *Genesis* (1982) in the difficulty of conveying contemporary models of multiplicity, chaos and complexity in conventional terms.⁵

Up until the final section of *Genesis*, scientific models of multiplicity, information theory and chaos are only touched on very lightly, and are imaginatively reconceived as noise. This is noise as a conduit of information theory⁶ of chaos, a great chain of contingencies and perpetual genesis. The reader at first finds it difficult to find bearings amongst a disconcertingly rambling, if erudite, cultural and mythological account of the flux and multiplicity underlying all things. Yet, with persistence this effectively prepares one for the concept of infinite noise, disorder and turbulence underpinning the order of life as described in the final chapter. In this section, Serres reflects more directly on how philosophy is situated in relation to scientific knowledge processes. And it is here Serres (1995: 104) says of science:

The sciences amongst themselves perform a surveillance, a monitoring that is both conceptual and social, and which defines the validity of a learned procedure ... This regulation, this self-regulation, this set of feedbacks in the networks of relations, makes up the main constraint for anyone wishing to enter the community in question. This is the cost of efficacy, of all efficiency: as much for discovery as for honours, medals and careers.

Philosophy, on the other hand, is valorised as:

...only performing its regular duties when it drills us in liberation. There was a time when science liberated us from certain slaveries and from darkness ... Sadly, the time has come when the sciences are letting themselves get trapped in the customary subservience of groups who are looking only to perpetuate themselves as a group. Thought can only live free from these constraints. The misfortune of our times is that these constraints are precisely those of thought of such: exactitude, rigorousness, precision ... Hence our narrow margin, our small degree of freedom. (1995: 105)

Yet it is precisely this margin that allows Serres to meditate on the complexity of life revealed to us by science through passages across scientific disciplines (of the kind Margulis had called for), and turns his attention to the perpetual processes of genesis in a universe which, Serres proposes (1995: 107), is:

...intermittent, it is quasi void, it is a distribution, a sowing of nebulous forms, clouds, galaxies ... an immense fractal turbulence, a global turbulence of large, medium, small ... microscopic turbulences ... This model has huge ramifications, like countless models at work in our knowledge today.

He contrasts this turbulence with the older scientific model that once assured even the non-religious of an underlying order of the world. Yet, "It is not so; our earth is quaking. The cosmos, the universe, in our languages, are misnomers. It is better seen, ultimately, as an intermediary, it is a mix of order and disorder" (1982: 107).

Hermes, who reappears in this book as a vector of noise, remains the powerful god of passages. Thus for all the ludic non-linearity of Serres' reflections on the history of science or the mythopoetic imagination, there is an inchoate, and persuasive sense that his Hermes has a most serious task in transgressing the institutionalised boundaries between the sciences and the humanities. Hermes questions the ascendancy of techno-science over other ways of

knowing the world, and above all transgresses the global boundaries erected between the human and non-human worlds: the boundaries where Gaia, mother of the Greeks, still calls to her children across the generations.

Gaia

The story of human dependency on the non-human has a Palaeolithic genealogy emerging with the prehistoric origins of human culture, and there are many Western historical antecedents to the idea of human–non-human interdependence that predate the late-twentieth-century reconfiguration of the Greek goddess Gaia. Cultural images of human history as a *longue durée* of relations with the non-human can be identified before the advent of European romanticism, but there can be little doubt that romanticism represented a broad cultural shift in which nature was increasingly accorded a more central role in the human story. From the mid nineteenth century Darwin's historicisation of nature, despite its opponents, confirmed the phylogenetic links between the human and non-human world, along with the consolidation of other disciplines in the nineteenth century such as anthropology and archaeology, which also facilitated the understanding that both a long term history and the study of specific conditions of place enabled a more general study of all social structures. If Marxist historiography required a focus on the material and bodily processes of history, by the mid twentieth century the historiography of the *Annales* School also laid much more emphasis on the role of nature and climate in relation to social histories, surpassing the temporal and spatial boundaries of the previously largely discrete disciplines of geography and history. But it was the general shift in cultural and political awareness from the 1960s and 1970s with the emergence of the green movement and eco-feminist thought that provided a social context in which Lovelock's Gaia hypothesis could gain considerable influence in the public sphere.

It was from that time that *Gaia*, Greek daughter of *Chaos*, and mother of the earth, reappeared as a distressed figure standing at the symbolic threshold, which demarcated a pivotal point between the height of twentieth century late modernity and its potential decline into an era of ineluctable ecological decay. She is, as such, an anthropomorphic figure, yet one who nonetheless carries the entire non-human world within her body. Before empowering Apollo as the source of prophecy at Delphi, Gaia was reputed to be the original voice of the Delphic oracle, and it was she who could call across the generations as the voice of the future. To take an oath in the name of Gaia was, for the ancient Greeks, the most serious of undertakings, to trifle even with the name of the earth, a grave error. Meanwhile, in our own age, philosophy, despite some exceptions, seems to have left her on the margins, a shadow of primitive memory essentially redundant to a persistently anthropocentric ontology of the world.

If Gaia was the first Delphic voice to sing of human fate, she was also Greek mother of ocean, earth and heaven. In her reappearance in modernity, however, she has become a populist metaphor for a philosophy of nature refuting the dominant theological order of the last two millennia, that is to say, a modern ontological order in which nature is accorded full recognition as a necessary condition of human consciousness. It is, moreover, an ontological model that eschews a matter-of-fact materialist monism in preference for an image of the world as a complex relational network in which the whole is always greater than the sum of its parts, a condition, perhaps, best compared to music: a choric song of the earth. As a hopelessly anthropocentric figuration, Gaia, quite understandably has her detractors as an image of the

non-human world. Yet as Evan Eisenberg (1998: 271) has pointed out, if James Lovelock, the medical chemist who called on Gaia to represent earth systems science, had chosen instead a scientific name for his model of the earth as a highly complex organic system, it would have had a lot less public currency than the Greek image of an ancient, nurturing mother. Despite the charge of naïve teleology and anthropomorphism that has been leveled at Gaia's followers, or even simply as Latour would have it: its apparent inability to rouse political action (Latour, 2004: 5) the Gaia hypothesis nevertheless has serious scientific support, not least from the distinguished evolutionary earth scientist Lynn Margulis who has observed however that:

The Gaia idea requires geologists, geochemists, atmospheric chemists, and even meteorologists to understand science outside their own fields. They must study biology, especially microbiology. But academic apartheid breeds resistance. Accepting Gaia would lead to action that people in related fields are loath to take. (1998: 125)

In February 2007 the Intergovernmental Panel on Climate Change made public the scientific consensus that climate change is now recognized as a *current* process, rather than the predicted outcome of existing global carbon emissions. The imperative of environmental degradation has led to a growing awareness of the need for trans-national, and cross-disciplinary cooperation, but it is a slow process that in the more pessimistic view, such as Lovelock's most recent work in which he sees such processes, though urgent, to be essentially too late to avoid global catastrophes. There are other, equally pressing, if more optimistic accounts such as the work of George Monbiot (2006), where he urges a cultural reevaluation of the complexity in finding sustainable solutions to climate change by returning to the kind of dialogues suggested by Margulis almost a decade ago.

It is into this contemporary field that Michel Serres sees the primary task of philosophy as an agent of communication, and one that accrues a particular urgency in his later works. One of Serres' major concerns is the social and environmental consequences of the twentieth century ascendancy of science over the humanities. His response to this ascendancy is conceived in both his sustained interdisciplinarity as a writer and his ontological model of intersections, interrelations and complexity. Like Deleuze, Serres uses the tempo-spatial model of the Fold as a means to comprehend complexity, and he envisages the classical figure of Hermes – winged god of messages and communication – as a trope of the task of philosophy. Yet behind Hermes stands the more ancient figure of Gaia, and it is her song of prophecy that becomes central to Serres' later work. Her presence is tacit, and in interviews Serres maintained that his major task when approaching the question of ecological crisis was to adapt philosophy to the status of law, yet her mythological presence is unmistakable especially when the discourse on law expands into the heartfelt fear of her loss.

Apollo (8)

In what is probably the best known of his later works,⁷ *The Natural Contract* (first published in the French in 1990) Serres' ambitious project is aimed at extending the definition of legal contract underlying the rights of citizens and according them to the non-human world. Characteristically, Serres does not begin this project with a discussion of law and history, or with science and law, though they do become central to his argument, but rather by crossing disciplines with art as a central metaphor of his argument. Serres begins the book with an

allegorical discussion of Goya's *Men Fighting with Sticks* and to the victorious figure of Achilles, king of war, in Homer's *Illiad* (Book 21). Homer's Achilles throws so many of the vanquished into a swollen river that it rises and threatens to engulf him. Goya's painting depicts a brutal duel between two enemies knee-deep in mud. The more furiously they fight, the faster they sink, oblivious to their fate. Serres' attention, however, is drawn to the quiet third protagonist in these events, the river, or the swampy marsh threatening to swallow the antagonists, in short, the world of things in themselves. It is clear from the outset that this third factor is Serres' main concern as a problem of global significance. Serres writes:

Our culture abhors the world. Yet quicksand is swallowing the duelists; the river is threatening the fighters: earth, water, and climate, the mute world, the voiceless things once placed as a décor surrounding the usual spectacles, all those things that never interested anyone ... What was this local – this river, that swamp – is now global: planet Earth ... At stake is the Earth in its totality, and humanity, collectively. Global history enters nature, global nature enters history: this is something utterly new in philosophy. (1995: 3–4)

Hence, the state of war is now primarily a war against the non-human world initiating Serres' discussion of war as the engine of history, a history in which war is only delimited by law. Delimitations, however, as we have seen, do not present a barrier to Hermes, hence the contractual agreements established in war as the defining process of history are those Serres extends to the non-human world, and in short to a *Natural Contract*. Like our ancestors, with their primitive social contracts, we are: "De facto allies for the same reasons and contracts as before, the competitors press with all their weight on the world" (1995: 16).

Serres then shows how the *leviathan* of the contemporary global cities have reached a critical mass in their parasitical relation to the world in which there is a dangerous lack of equilibria, a picture evoked from complex disciplinary sources:

There are one or several equilibria, described by physical mechanics, thermodynamics, the physiology of organisms, ecology, or systems theory; cultures have even invented one or more human and social equilibria, which are decided on, organized, and maintained by religion, laws or politics. But something is missing: we are not conceiving, constructing, or putting into operation a new global equilibrium between the two sets of equilibria. (1995: 37)

In describing mature social relations as a symbiotic rather than dominantly parasitic process, Serres then launches his case for a symbiotic ontological system between the human and non-human world, but he does so through Plato's metaphor of the ship of state. This effective image draws on the contractual agreement between Plato's sailors as a fitting analogy of our will for survival in an age of global warming. The sailors' contract that the welfare of the ship comes before the interests of any individual is thus extended to the world itself where each of us needs to be reminded of the ancient nautical rule where, "A simple unwritten law thus reigns on board, the divine courtesy that defines the sailor, a non-aggression pact among sea-goers, who are at the mercy of their fragility" (1995: 40).

It is then, the orientation of the word *polite* that for Plato's sailors steadies the course of the *politic* rather than the *polis* as the foundation of the political processes of the new contract. Serres follows this call for a return to the ship of state with a history and philosophy of the relations between science and law from ancient Egypt and classical antiquity through to Leibniz and the age of Enlightenment, a history witnessed within the folds of time constituting modern subjectivity, and always present just beneath our levels of self-awareness. It is from this history that Serres reminds us that the contract originally meant the tract. That is, the trait or draft that tightens and pulls, yet links us through a fold in time to modern information and complexity theory, thus:

A set of cords assures, without language, the subtle system of constraints and freedoms through which each linked element receives information about every other and about the system, and draws security from all. (1995:103)

It is at this point in the contract in which Hermes, god of commercial contracts, reappears as a configuration of the most fundamental form of human self interest:

The name Hermes refers to the totality of the bonds of every kind that attach all of humanity to the world's globe, and vice versa ... Bound together by the most powerful web of communications lines we have ever spun, we comprehend the Earth and it comprehends us, not just at the level of philosophical speculation, which wouldn't have been all that important, but in an enormous play of energies that could become deadly to those who inhabit this contract. (1995: 109–110)

It is the age of Leibniz, the enlightenment science of the seventeenth century that forms the foundation of what I choose to call here the age of Apollo, an age of reason and the ascendancy of science in which we have reached a critical juncture. It is, moreover, this primacy of science that has for the first time, enabled us with the ability to "cast off" as Serres puts it, only to add in a less sanguine tone "Casting Off for the First or Last Time?" (1995: 111).

It was this "casting off", so to speak, that enabled the initial photographs of the earth taken from deep space in 1968, when Apollo 8 carried the first astronauts to orbit the moon. It is Apollonian enlightenment and technology that have enabled this new vision of the earth, and Serres speaks of the distant earth in the camera lens as an unequivocally pivotal moment in history:

For the first time, philosophy can say man is transcendent: before his eyes, the whole world is objectifying itself, thrown before him, object, bond, gear, or craft, man for his part, finds himself thrown outside, totally cast off from the globe. (1995: 121)

That is, with the exception of Hermes' bonds and cords of communications, and of the implicit natural contract: the originary, umbilical connection between human and non-human. In a recent interview Serres described *The Natural Contract* as a book that "deals with the philosophy of knowledge and action in relation to problems posed by contemporary science and technology" (2006: 3). He refers to the long historical process of emancipation in which political rights were assumed – not just by male citizens of the Greek city-state, but little by little to slaves, foreigners, women and children. Serres remarks that this process is not

complete “as long as it does not determine that all living beings and all inert objects, in short, all of Nature have in turn become legal subjects” (2006: 2).

This, to be sure, is a radical ontological claim, though Serres makes it clear that “I am neither so dumb nor so animistic to think that nature is a person” and clearly Serres is neither.⁸ At the end of his book, however, there is a shift in tone in a passionate dedication to the earth: “mother, my faithful mother, our mother”, and to the hermetic bonds or cords that bind us. Thus as Serres concludes his book “In Distress”, Gaia reappears between Hermes and the lens of the camera on Apollo 8, at the crossroads of fate and will, called forth by a philosopher crossing from science to art and mythology in order to persuade us that philosophy is the cord of communication that connects and binds them, and us, to the earth.

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Notes

1. The molecular biologist Stuart Kaufmann, is a case in point. In *Investigations* (2000) for example, his discussion of how autonomous agency in coevolving biological systems cannot be pre-stated is also discussed in relation to economics.

2. There has been a proliferation of mass media discussions on such topics, particularly in response to public announcements by the Intergovernmental Panel on Climate Change. A specific case in point is “The Green Room” a new series of environmental opinion articles running weekly on the BBC news website. Another is the BBC expert panel convened to discuss James Lovelock’s thesis on earth systems science in July 2006.
3. Initially Serres was a specialist on Leibniz, and on relations between science and philosophy in the 17th century.
4. Serres was required to teach the history of science in a history department, for which he was “distanced, excluded, expelled forever from teaching philosophy. I suffered a lot over it” (Serres & Latour: 1995: 34).
5. Serres’ other books published in the 1980s not discussed here are: *Détachment* (1983); *Rome: the book of foundations* (1983/ Transl.1991); *Le Cinq Sens* (1985); and *Statues: Le second livre de foundations* (1987).
6. Biological information theory first posited noise, or interference, as a factor in relationships between two agents. At first, interference, or noise was seen as a neutral ground for information passed between sender and receiver, but was then seen as an active component in the transmission of information.
7. Other later works include *Le Tiers-Instruit* 1991 and *La Légende des Anges* 1993 both of which were later published in English.
8. Serres notes that similar objections were first levelled at Rousseau’s Social Contract – no one has ever signed this contract in a documented ceremony, commenting that the General Will has as few hands as nature.