

# Media Ecology in Michel Serres's Philosophy of Communication

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**Abstract:** Throughout his philosophical project Michel Serres uses the etymological connections between words to reveal much larger experiential and philosophical links. One such connection is between the words ‘media’ and ‘milieu.’ In this paper I show how Serres’s philosophy of communication can be used to think critically about the relationship between media and the environment. The paper provides an introduction to Serres’s mode of thought, focusing on his treatment of communication systems. It explores his articulation of noise, information, and thermodynamics and what this contributes to critical discussions of media ecology.

**Key words:** Michel Serres, eco-theory, technology, nature.

Although receiving relatively little attention in terms of secondary criticism, Michel Serres refers to media in a number of his books. In *Malfeasance* he discusses advertising as a form of pollution (Serres 2011). In *Atlas* he discusses the subject’s orientation within a global system of networked communication (Serres 1997) and in *Angels*, reiterated in *Conversations on Science, Culture and Time*, he gives us an image of electronic communication and the television as an element in a modern day religious ritual (Serres 1995a, 118; Serres and Latour 1995, 192). Not only this, but sections of his broad ranging and often experimental philosophy of communication can be re-read as a materially-oriented description of media, where he explores the transformation of messages as they are passed through channels. But Serres’s philosophy of communication is not simply concerned with *the* media, as a set of cultural artefacts such as television programs, films or books. Instead, his work on communication systems can be read as a way to think philosophically about media as a collection of channels, which may be technical, social, historical, or natural.

In this paper, after giving a general introduction to the concept of media ecology that motivates my reading of Serres,<sup>1</sup> I explore two interrelated elements of his philosophical project. First is his understanding of information in terms of thermodynamics, which is one of the starting points for his philosophy of communication. Second is his related treatment of noise, which likewise frames a large part of his thought on communication. These elements of Serres's work offer a way to describe communication and information as embodied material objects and a unique way of conceptualising the relationship between the physical components of media and the quality of information.

Serres's exploration of communication media as a channel for transformation is perhaps best seen in his book *Angels* (1995a), which is written in the style of a Platonic dialogue between Pia, an airport doctor, and Pantope, a travelling inspector for an airline. In this book, which opens with a scene at Charles De Gaulle Airport, Pia and Pantope discuss wide-ranging topics such as religion, law, reason, poverty, labour, and new communications technologies, all of which are framed by a history of the religious myth of angels and the contemporary realities played out in the airport, and all of which reveal the way humans strive to make contact with one another through message-bearing systems. Throughout this dialogue it is revealed that electronic messages and aircrafts, both of which carry messages through the air, could be considered newer versions of angels, which likewise take to the air to transmit the Word (Serres 1995a, 7). Through this dialogue, Serres argues that an understanding of the mythological function of angels allows one to see further into the functioning of contemporary media. Stories of Raphael, who leads Tobias; stories of fallen angels, who distort messages; and stories of heaven and hell are used to show how message-bearing systems, whether angelic or electronic, simultaneously lead us, create misunderstanding, and demarcate humans into separate worlds (Serres, 1995a, 165–66). The book demonstrates how, in Serres's view, modern communication systems are not simply technological inventions but ones that are based on and continually rehearse much older mythologies. "Our more advanced technologies are enacting the classic angelic function of guiding" (Serres 1995a, 166).

In Serres's philosophy of message-bearing systems it is not just angels and aircrafts that act as media systems, but also global winds that circulate the globe. A change in heat in the Australian desert affects the wind at the equator, causing the climate phenomenon referred to as El Niño. This results in changes to the climate of Peru and forms cyclones in the Caribbean, which in turn affect the Gulf Stream and go on to affect weather in western Europe. In Serres's hands, these global

flows equate to the transmission of information, bringing “news of Alice Springs to Sein or Originy” (Serres 1995a, 29). Pia tells Pantope that “at any given moment of the day, the breeze plays on your cheek, and since it carries codes from everywhere, it’s telling you about the body of the world” (Serres 1995a, 29). The wind, for Pia, acts as legions of angels, tiny particles that construct a universe (Serres 1995a, 29–30). Winds that carry heat are the intermediaries connecting far away places to produce a global system. The wind, much like angels and the technological infrastructure that facilitates globally networked electronic communication, creates a huge message bearing system.

Serres’s articulation of the global circulation of heat and information—a linking of the thermodynamic and the informational—is a way of dealing with the relationships between the natural and the symbolic environment. A number of ecologically-oriented media theorists have likewise begun to grapple with the relationship between the ‘hard’ natural world and the ‘soft’ environment produced by media. With the exception of recent and ongoing work such as Doug Kahn’s (2012; 2013) exploration of electromagnetism in the arts and Bruce Clarke’s (2009) cybernetic inspired approach to environmentalism, most of the literature in the field has focused on the representation of nature as media content. This work focuses on the way that the cinematic or the television apparatus translates the ‘natural’ into symbolic content (see for instance Ingram 2004; Mitman 1999). While this is undeniably valuable work, there is room to move past the current focus on mediated representations. Serres provides one possible way to move beyond the current state of the field by offering a way to talk about ecology in media philosophy terms by focusing on the codes of media and the world that these codes produce. In *Angels*, Serres presents a scene at Charles De Gaulle Airport where passengers wait to board a plane. Some, from Berlin, Boston, or London, are going on holiday; some, emigrants from Africa and Asia, dressed in tattered clothes, are looking for work (Serres 1995a, 187–92). He asks “How far back in history would we have to search to find an inequality as shameful as the one that separates these two queues?” (Serres 1995a, 188). What’s more, air travel separates the world into two different regimes: that of the air, as first-world travellers fly around the globe, and that of the earth, the poor that are left below (Serres 1995a, 191). This division is much more acute than a separation between rich and poor. Instead this separation, facilitated by the codes of media systems—if we follow Serres and accept air-travel as a medium—is a separation that rehearses religious myths that separate gods and mortals, the first occupying the higher sphere, the second bound to the earth. Through analogies such as these, which blend religious mythology, human

affairs, the codes of media systems, and the movement of information, Serres offers a media theory that focuses on the actual *performed* relations—exploring what media actually do—rather than the *pre-formed* representations—which would focus on what media depict. For a media theory inspired by Serres, it is the flow of information across a diversity of media channels that is the topic of philosophical inquiry and it is the codes that condition this flow that come in for critical scrutiny.

### Multi-temporality

Serres's work is characterised by a tendency to link historical moments that on the surface seem to have little to do with one another. At one moment Serres uses angels to understand communication. At another, he uses a painting by Francisco Goya to understand the pre-conditions for the contemporary environmental crisis. This method of making the seemingly disparate connect is a strategy that seems to mark Serres's thought as characteristically 'experimental,' as he purposefully tinkers, unties, and combines ideas to see how they work. Thinking of the contemporary moment in this fashion is designed to get at the *multi-temporality* of new inventions and events, which are, for Serres, always reiterations of much older ways of doing things.

In a dialogue with Bruno Latour, Serres gives the analogy of a late model car to explain this method:

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. (Serres and Latour 1995, 45)

The late model car, like Serres's discussion of angels and contemporary media, draws together once disparate moments in time into a field of multi-temporality. As Adrian Mackenzie (2002) points out in his reading of Serres, "there are clearly no purely present-day artefacts, only mixtures with associate elements inherited from different times" (70). Serres discussion of the late model car reveals a particular topological conceptualisation of time that percolates throughout his work. In Serres's philosophy historical events are not able to be separated at homogenous intervals along a timeline. Instead events that appear to be separated by great distances can be made to connect, with one folding into the other. Serres explains this in his conversation with Latour by giving the example of a handkerchief:

If you take a handkerchief and spread it out in order to iron it, you can see in it certain fixed distances and proximities. . . . Then take the same handkerchief and crumple it, by putting it in your pocket. Two distant points are close, even superimposed. (Serres and Latour 1995, 60)

For Serres the actual lived experience of time resembles the topology of the crumpled handkerchief. By thinking topologically about time Serres also provides a way to think ecologically about history, as a site of numerous and complex multi-temporal relationships.

The first page of *The Natural Contract* shows a reproduction of Goya's *Fight with Cudgels* (c. 1820–1823). The painting depicts two men beating one another with clubs, seemingly unaware that they have sunk up to their knees in quicksand. Caught up in their own human conflict, they are unprepared for the non-human world that is swallowing them up. The men literally beat one another senseless—they have no way of hearing, seeing or otherwise detecting in nature a third duellist. They have divided the world, paying attention to human affairs but not to non-human events, and this division will eventually be fatal (Serres 1995b, 1–2). Goya's painting is used by Serres as an image with which to think about the history of human culture that has been built as if on a stage purified of non-human things. Serres then asks for a revision of this distinction, calling for a contract between humans and nature, a natural contract akin to the social contract that binds human societies together (Serres 1995b, 38). This contract, by linking the sciences of natural systems, the symbolism of legal systems, and the protocols of culture, would act as the umbilical cord that attaches humans to planet Earth.

In *Malfesance*, following in much the same style of thought as *The Natural Contract*, Serres begins to think about media, nature, and pollution in a way that links ontological matter with symbolic communicative gestures. *Malfesance* discusses the pollution produced by factories, home heating, and cars as a hard, physical waste, whether gaseous or solid, produced as an output of sustaining life. But Serres expands this definition of pollution to think about the soft, symbolic forms of pollution that generate, as he puts it, “a perpetual background noise with its deafening din” (Serres 2011, 49). Just as in his reading of Goya's painting, in contemporary Western culture nature is ignored, covered over, eliminated, made inaudible, by the background noise of media systems. At these points, like duellists fighting with cudgels, the noise from media drowns out all the other things with which we live, whether these neighbours are human or non-human. The noise of media systems gets in the way of a natural contract; it sustains humans temporarily

by forcing nature into the background. In these examples, including advertising, Goya's painting, angels, and air travel, Serres offers a way to think ecologically about media systems by focusing on the efficacy of the codes and the information, noise, and silences that they produce.

### **Media Ecology and Material Media Theory**

Aside from the recent movements of eco-media and eco-cinema, the topic of media ecology has a relatively long history in the discipline of media studies. Based largely on Marshal McLuhan's work, the idea that media operate in an ecological system has fostered a tradition of North American media theory usually collectively referred to as the Toronto School. This type of media ecology focuses on the way media systems relate to one another and work together, with not much reference to the natural world. The type of media ecology that I focus on in this paper has little to do with this use of the term. My re-reading of Serres as a media ecologist is instead closer to Matthew Fuller's (2005) use of the term, by which he rethinks the human condition as an assemblage of both technological and natural elements (25–31). Fuller, like Serres, goes beyond an anthropocentric understanding of communication and instead thinks ecologically about information and the organic, cultural, technical and political systems that produce it. To illustrate this Fuller gives the example of the voice of a pirate radio broadcast. Fuller's illustration is worth unpacking at this point as it introduces the style of media philosophy that motivates my reading of Serres and allows me to see in his philosophy of communication a radical media ecologist at work.

Fuller shows that a voice is at once produced by vocal chords, throat, lungs, and teeth, but also produced by the technical elements to which it connects, such as microphones and loudspeakers, as well as an array of symbolic and social elements such as drugs, clubs, and advertising (2005, 25–26). The voice is not the voice of the subject *per se* but the voice produced by a particular movement, a performed relationship, within this media ecology. In a passage that seems inspired by Serres's work, Fuller states, "a media ecology is a cascade of parasites. These parasites, rolling around inside each other's stomachs . . . , these medial organs all grab hold of each other, gain purchase and insight by means of their particular capacities" (2005, 174). As will be seen later, the use of the parasite as a metaphor in Fuller's work resonates with the use of the parasite in Serres's own work, which acts as both interference within an existing system and as a way of forming new systems within communications networks. A media ecology is made up of parasites in that one piece of media—the television, the cinema, the radio, print—draws

things from the others. As well as these traditionally understood media systems, things such as aircrafts, global winds, angels and other message bearing systems define cultural routines as information gets coded based on the protocols of new media systems, which have been carried over from more archaic functioning of older media, such as angels. Systems are developed where content flows through parasitic relationships, with media content, like the previous example of the voice of pirate radio, moving through the various connections between media.

Both Fuller and Serres offer a way to think about communication in terms of the materiality of bodies and technologies and the protocols of technical and cultural codes. Before Fuller, a tradition of what has become known as ‘German media theory,’ including Friedrich Kittler and Vilém Flusser, set a foundation for the type of media philosophy that I try to extend in my ‘motivated’ reading of Serres. These thinkers showed how, on a technical level, media organise the world based on programs of technical apparatuses: Signal is transduced into groves, grains, pixels, and strings that can be re-arranged. For Flusser (2011), the photograph, as the archetype of a technical apparatus, causes the ‘hard,’ ‘outside,’ ‘concrete’ world to disintegrate into pixels, both in terms of the technical processing of data and epistemologically. Like Serres’s emphasis on the operation of codes, for Flusser the photograph composes the world based on its programming. It treats the world in terms of the qualities of light within very small pixels and causes the photographer, the user of a technical apparatus, to treat the world in the same way. Flusser states,

The world in which they [the users of technical apparatuses] find themselves can no longer be counted and explained: it has disintegrated into particles—photons, quanta, electromagnetic particles. It has become intangible, inconceivable, incomprehensible, a mass that can be calculated. This mass must be computed to make the world tangible, conceivable, comprehensible again, and to make consciousness aware of itself once more. That is to say, the whirring particles around us and in us must be gathered onto surfaces; they must be envisioned. (Flusser 2011, 31)

Like Flusser, for Kittler (1999) developments in technical apparatuses represent vastly new ways to understand the world, as stored modes of discourse. In *Gramophone, Film, Typewriter* he shows how the discovery of communication as waves and frequencies altered the way humans come to grips with non-human objects, as signal is passed through media (Kittler 1999, 170–71). My reading of Serres is inspired by the material approach to media exemplified by Fuller, Flusser, and Kit-

tlar. This is not to simply try and see in Serres elements of material media theory, but to explore how his work can extend this mode of analysis. What Serres offers beyond the tradition of a materially-oriented media theory is a way of understanding the transformations that media—radically understood—facilitate through an informational perspective. Fuller, Flusser, and Kittler are oriented toward the material properties of media. They focus on how technical processes transduce signal into information. Serres is oriented towards the material properties of information and the systems that it establishes and maintains. Serres's philosophy of communication adds to the materialist approach to media theory by focusing attention on how information works within media channels to establish the systems by which we experience and establish our place on the planet.

What is at stake in Serres's work is a way to think about communication and information beyond recourse to notions of human subjectivity and language. Much like Serres, the work of philosophers such as Bruno Latour, N. Katherine Hayles, Don Ihde, and Gilles Deleuze signals a movement, albeit in very different directions, to get beyond the primacy given to the human subject and begin to map out, in their own unique ways, a theory of experience that includes the agency of non-human objects. Latour (2007) devises actor network theory, Hayles (1999) suggests a post-human approach to analysing experience, and Ihde (2009) reformulates Heidegger and Merleau-Ponty to replace consciousness with the concept of embodiment, while Deleuze (1992), using concepts borrowed and reworked from Leibniz, has for many set the foundations for a radical view of the world that gets beyond divisions of subjects and objects. What Serres adds to this discussion, when read through the perspective of media ecology, is a way to think about the relationships between media technology and natural phenomena in terms of a shared materiality of message bearing systems. These theoretical maneuvers, where both 'subjects' and 'objects' are understood as informational systems, have been a way of bringing together the human and non-human worlds, trying to overcome the bifurcation of nature into two systems. In Serres's philosophy we can read a theory of media that offers a reframing of the relationship between the human and the non-human environment via the technological movement of messages over networks. It is in this sense that Serres can be re-read through the framework of a materially oriented media theory and seen to offer a philosophy of the transmission and transduction of signals.



## Information and Thermodynamics

Perhaps the most productive move that Serres makes in reformulating theories of communication has been to make, with the help of Claude Shannon's now famous research conducted during World War II, the connections between the informational and the thermodynamic. Shannon allows Serres to treat information and noise as material entities that share a footing in reality with all other kinds of material objects. This emphasis on the materiality and mathematical properties of information and noise was a major turning point in Serres's project, marked by the publication of the *Hermes* volumes and still present in his work today. In an interview with Peter Hallward, Serres narrates his movement from the traditions of continental philosophy, through the mathematics of Bourbaki, to Turing and the physical problems of information. He states,

I was beginning to study physics, that is, to understand the problems regarding information. I was struck by the concept of background noise: in any dialogue whatsoever, there is a conversation between the counterparts, which dictates that we should struggle against the noise that would otherwise hamper our conversation. This was a relatively novel concept of communication. (Serres 2003, 230)

In any exchange a set exists, with the elements united by the transferal of information, which continues against a persistent background noise. But this noise also plays a role. It can become productive as it is picked up from outside the communication channel and transduced into information.

The ability to think through the effects of the physical and informational properties of sets is a major feature of Serres's work and largely underpinned by his reading of Shannon's treatment of information. For Shannon, a theory of communication should not be based on the decoded content of a message, but the fact of the possibility of transmission of signal through a channel. Working on his mathematical theory of information, Shannon proposed that information be seen as possessing measurable qualities and that the 'noise' or 'uncertainty' with which information was received should be referred to as entropy, thus borrowing one of the most vital terms in thermodynamics. This type of noise could be anything that forms a barrier to information. Shannon's decision to name noise entropy, as the story goes, is largely due to some advice that he was given by a fellow mathematician, John von Neumann.

You should call it entropy, for two reasons. In the first place your uncertainty function has been used in statistical mechanics under that name, so it already has a name. In the second place, and more important, no one knows what entropy really is, so in a debate you will always have the advantage. (von Neuman in Tribus and McIrvine 1971, 180)

Before Shannon's work entropy was defined as the measure of disorder in a thermodynamic system. It referred to the amount of energy that was not available for work. After Shannon's work entropy referred to the obstacles to information transmission. Entropy became an element in the equation that reduced the probability of information reaching the receiver.

For Shannon the naming process of entropy involved happenstance and a repurposing of the original term, moving it from one field of study to another and, like any act of mediation, transforming its meaning in the process. For Serres though, much more than this, the transformation of the concept between conceptual spaces, in a more topological sense, confirmed the link between energy and information. Shannon uses entropy as a metaphor. But Serres takes this mediation seriously and, doing so, gives us a way to understand the world as constituted by energetic exchanges of information. If entropy, a terms usually reserved for discussions of thermodynamic systems in physics, can be used to describe noise in communication studies, what new insights can then be gained if we take this metaphor to its conclusion and begin to think of information as akin to energy?

When analysing a technical system it is traditional to separate information and energy.

For a computer this would be the bits on IBM cards or the like plus the necessary energy for heating the filaments. The two accounts had no proportion in common; they were not even on the same scale. An enormous coefficient separated them ( $10^{16}$ ). (Serres 1982a, 81)

But as Serres points out, this is not the case for an organic system, such as the human. "The difference between a machine and a living organism is that, for the former, the information account is negligible in relationship to the energy account, whereas, for the latter, both accounts are on the same scale" (Serres 1982a, 81). For the living being information-noise function in the same way as negentropy-entropy.

To explain this, Serres gives us a reading of Freud's description of repression.

On one side, transformations, fixations, a set of energy displacements occur—no metaphor is needed here, for the processes under consideration are

simply chemical or thermodynamic. On the other side, the entire complex of these movements is grasped by the observer, that is, by the integrating level as such, by the change in sign of the ambiguity function. (Serres 1982a, 81)

Using the terms of information theory to understand repression, Serres tells us that the energy displacements, the entropic behaviour of repression, are visible to the observer. Sensing them, and understanding that they signify repression, the observer transforms entropy into information. The ‘rectifier,’ as he puts it, converts noise into information. When a system is organised, when all its elements are the same, it gives off no information, only similarity and redundancy. There is no difference that offers us any information. But once a system becomes disorganized, once it becomes entropic or noisy, an observer can discern elements that are informative.

Shannon’s work confirms for Serres that information exists as a material and measurable thing. Taking Shannon’s work beyond its limit, Serres is able to go so far as to present the living organism as defined by its existence as both an informational and thermodynamic system: “it receives, stores, exchanges and gives off both energy and information—in all forms, from the light of the sun to the flow of matter which passes through it (food, oxygen, heat, signals)” (Serres 1982a, 74). Serres describes the living organism in a way that, as he asserts, finally gives meaning to Shannon’s coupling of noise and information. It is an apparatus that produces language from information and noise. Doing so, this apparatus that transduces information and noise forms systems with other elements that likewise engage in information exchange. To demonstrate this we can return to the beginning of *The Natural Contract*. The duellists in Goya’s paintings become so wrapped up in battle, that they are oblivious to the noise of the natural world that swallows them. They no longer possess the decoding skills to grasp the noise of their surroundings and turn it into information. Likewise, pollution from advertising dulls any information or noise that might otherwise be heard from the natural environment. It relegates all information that might come from noise in place of the repetition of images, billboards and redundancy. Organizing and dominating human communication, these practices have silenced anything outside their channels of communication: Codes work by excluding noise.

There are many examples of the use of codes to exclude noise and make information exchange possible. One of the most well-known is the protocological functioning of internet based communication, where the operation of communica-

tion codes organizes information transfer. Computers are able to communicate with one another over a network due to a shared set of protocols such as TCP/IP which establish a standard for the ordering of a stream of bytes and the routing of packets. This doesn't just occur in computer-mediated communication. For any communication to take place whatsoever there always exist codes and protocols that limit what can be done but that simultaneously make communication possible by exclusion. They try to maintain systems by excluding noise, like Goya's duellists who ignore the world by focusing on their own conflict. However, as David Webb (2003) points out, codes never attain perfect transparency. We always potentially live within noise. Protocols are always open to hackers. The duellists will eventually come to terms with the world, but only too late. What Serres calls the third man, the interference in the channel, both interrupts but also creates new systems and new ways of communicating. In Serres's philosophy of communication, and his development of a radical media ecology, noise—the third man—plays a key role.

### Noise

In the translator's preface to Serres's book *The Parasite*, Lawrence R. Schehr first warns the reader that the text is awash with multi-lingual puns (Serres 2007, vii). Not just trivial turns of phrase, these puns are axioms that point to serious connections to be rigorously considered throughout Serres's philosophy. *The Parasite*, in its title, draws together three different, but for Serres interrelated, things. The word *parasite* can be translated from French to refer to a biological parasite—*biologique du parasite*—or a social parasite—*sociale parasite*—like a leach or an unwelcome house guest. This double meaning is the same in English. But *parasite* in French also refers to interference—*bruits parasite*—like white noise on the radio.<sup>2</sup> Parasites, the leach or the house guest, are then, quite obviously for Serres related to noise and interference, in experience as well as in language. The leach takes something from the human body, the house guest takes something from the host, and interference takes something from communication.

Fuller's use of the parasite as a metaphor for the system of media ecology can now be re-read as a system of disruptive noise, as each new element in a media system is a potential interference to old ways of doing things. Each new element is a step towards greater disorganization of the system. Each parasite acts as a switch that forms new and transforms old systems. We might say that the parasite's interference in the system disrupts the system. But it is also potentially productive, as it may establish mutations that lead to the development of new systems. A simple

example demonstrates this. The systems associated with television viewing over the last few decades have changed dramatically due to entropic noise. There has been much written in the area of television studies on new modes of viewing attributed to the development of online and mobile viewing platforms (Bennett and Strange 2011; Johnson 2007; Jenkins 2006). But if we follow Serres in our thinking about media ecologies, it could be that the noise, rather than the technology, of the internet, caused this alteration to industry and cultural practice. The internet introduced an oversupply of information originating from multiple sources to what was otherwise a relatively standard, predictable and redundant cultural practice of information transmission between the television and the viewer. As we know, it was not that the internet signalled the end of television. Quite the contrary, the parasitic medium of the internet and computer-based communication latched on to the dominant medium of television. As with any parasite-host relationship, a new system emerged. The noise of the internet both disrupted the established systems but also created a new system that television now, with its on-demand services, time-shifting, narrowcasting and multiple platforms, works within.

From the intervention of a third man, as entropic noise within a system, comes a new language and a new system.

At the feast everyone is talking. At the door of the room there is a ringing noise, the telephone. Communication cuts conversation, the noise interrupting the messages. As soon as I start to talk with this new interlocutor, the sounds of the banquet become noise for the new 'us.' The system has shifted. If I approach the table, the noise slowly becomes conversation. In the system, noise and message exchange roles according to the position of the observer and the action of the actor. (Serres 2007, 66)

Both the noise of the banquet and the noise of the telephone make order and disorder simultaneously. As Serres approaches the banquet table the noise is transformed into conversation, when Serres is on the phone this new conversation is noise for the banquet guests. The noise of the telephone, which disturbed the conversation, opens up a new system in the room, between Serres and the person on the other end of the line. Interference becomes what Serres describes as both a "phenomenon of physics" and "an art of invention" (Serres 2007, 71), as it becomes entropic to information but also inventive of new potentials and new systems. In *The Parasite* Serres repeatedly shows how the noise that was once simply thought to be added to a message in a communication channel becomes an actor in the system, obtaining a material presence as the 'third man' or parasite,

and continually changes the old systems of communication (the banquet) by activating new systems within it (the telephone). In the new system, the conversation becomes at the same time noisy and informational; Serres, once part of the conversation, is now noise for it as he speaks on the phone. And it is the very appearance of noise in the system that allows these transformations to take place. "The noise separates them and forms a complex system with two different feasts. Noise is a sign of the increase in complexity" (Serres 2007, 67). This is perhaps what Serres means when he says that "We see only because we see badly. It works only because it works badly. . . . I understand the message only because of the noise" (Serres 2007, 70). Without noise adding complexity to a system we are left with redundancy. The system ceases being informational and just produces more of the same. As Prigogine and Stengers (1984) argue, the increase in entropy signals an increase in the complexity of the world, rather than a march towards death. The increase in entropy may signal a new becoming, a new engine, where information and order are products of chaos.

### Sensing the Planet

Serres warns us that we will not find peace and quite in nature, only louder noise, more and more agitation, and troublesome disorder.

Space is completely invaded by noise; we are completely occupied by the same noise. The agitation is everywhere to be heard, beside the signal, beside the silence. The silent sea is misnamed. Perhaps white noise [*bruit de fond*] is at the heart [*fond*] of being itself. (Serres 1983, 50)

Again Serres draws connections between words, between white noise [*bruit de fond*] and heart [*fond*]. Noise and chaos are at once in the midst of being, at its heart, but also the background for its playing out. "White noise never stops, it is limitless, continuous, perpetual, unchangeable. It has no grounding [*fond*] itself, no opposite. How much noise has to be made to still the noise? And what fury orders fury?" (Serres 1983, 50). Serres answers this question in *Malfeasance*: To still the noise of the universe—to establish a closed off system of global communication—a massive grid of technological systems facilitates the circulation of electronic messages. Since Shannon's work, which first isolated the major problems for information transferal, a number of engineering developments and communication protocols have been designed to insulate communication from any signal outside the sender-receiver channel. Occasionally though, the noise of the universe becomes louder than the noise of humans and breaks through, transforming messages and systems,

much like the ringing phone at the door of the banquet or the noise of the internet which supported the transformations of television as a cultural medium.

A medium is required to be both sensitive and responsive for it to carry a message and for communication to take place (Connor 2002). For a message to travel over telegraph wires the copper has to be sensitive enough to transmit pulses of electricity. If this sensitivity declines, so too does signal quality and the speed of transmission. The qualities of sensitivity necessary for speedy and accurate transmission are the same that make a medium susceptible to noise. “Its risk, its exposures to interference, is what makes it work” (Connor 2002). Telegraph operators send signals by starting and stopping electric signals that run through networks of copper wire. The specific sequence and timings of these starts and stops make up a telegraph code. Signals move as bursts of electricity from human to human. However, during atmospheric events, such as storms and aural light shows, stronger electrical currents interfere with and overrun the coded messages (Carlowicz and Lopez 2004, 55). Kahn tells us that Alexander Graham Bell’s assistant Thomas Watson used to spend hours listening to these signals, which reportedly sounded like music (2013, 27–28). Following Serres, noise interrupts signal, nature interrupts human talk, but also creates a new system, no longer just between sender and receiver but between sender, receiver and the planet. Just as the noise of the internet created new systems now known as digital television, and the noise of the telephone created new systems at the banquet, in this example, the noise of the planet created new systems within existing communication networks.

Steven Connor (2010) gives a similar example from 1919. In deep underground bunkers Heinrich Barkhausen set up equipment designed to detect very weak electrical signals that leaked into the ground from Allied radio transmissions. Doing so, he accidentally recorded strange whistling sounds that over took the military chatter. Originally Barkhausen suggested that these tones were emitted from the Earth’s surface (Connor 2010, 207). But it was not until 1930 that he identified these ‘whistling tones’ as “launched at the Earth’s surface by lightning bolts” (Post 1995, 1622). It was also discovered in more domestic contexts that when someone is indoors, listening to the radio during a thunderstorm, that person can hear static taking over the broadcaster’s voice. In the early twentieth century acute listeners were even able to use the noise on the channel to determine the direction and magnitude of a storm by tinkering with the position of the radio antennae (Ihde 2009, 54). Eventually, as the antenna was turned skyward, this practice led to radio astronomy and the identification of sound waves beyond the Earth itself, as a background noise of the radiation of the universe (Kahn 2012, 25–26).

In this way, the noise of the universe became transformed into information and opened a new system that involved radio listeners and the solar system. The noise detected by radios, pointed to by Kahn, Connor, and Ihde, is part of the vast technological assemblage that Serres describes as one of the cords with which we are tethered to the earth and one of the channels by which we come to grips with the non-human world. He states:

Today the global power of our new tools is giving us the earth as a partner, one whom we ceaselessly inform with our movements and energies, and who, in return, informs us of its global change by the same means. . . . Our technologies make up a system of cords and traits, of exchanges of power and information, which goes from the local to the global, and the Earth answers to us, from the global to the local. (Serres 1995b, 109)

Our media systems and our advances in technology, as a system of cords, create a passage through which the planet not only senses us, but we also sense it. Through technology such as agriculture, the building of cities and ever-growing pollution, the planet senses and reacts to human civilisation, as we physically mark its surface. Likewise, through technology we are capable of sensing the planet, and through it, if we are willing, we might be provided with new ways to come to terms with non-human global systems.

## **Conclusion**

In this paper, I have tried to show how Serres's work on noise and communication can be used to explore the relationship between media technology and nature. Human communication systems have been developed for centuries to try to facilitate the clean transmission of messages by excluding non-human noise. The non-human world, however, has continually intervened, as noise and interference takes over the channel and the resulting repurposed media devices begin to sense the planet, connecting us (and hopefully alerting us) to this dynamic and potentially catastrophic place.

Using Serres we can understand human and non-human systems based on the transferral of information, both as machinery physically marks the land and as signal is transduced into noise. The task is to learn how to listen to the noise and transform it into information. Throughout history, the concept of nature, a highly mediated cultural concept, is produced as signals are passed through media, including electronic, cultural and political media. There is a political nature, based on considerations of our ethical and legal relationship to the non-human world.



There is a cultural nature, based on ideas such as wilderness and the positioning of nature in cultural artefacts (this is the type of nature that is the subject of most eco-literature and eco-cinema scholarship). Then there is electronic nature, which is based on the relationships established as signals are picked up and transduced by electronic media. This is the type of nature that needs to be the subject of an eco-critical media philosophy, which can be built using, in part, Serres's philosophy of communication. This would be a media theory that looks to the hardware and software of modern communication systems and asks how their design, their protocols and their logic act on our relationship to the noise of the outside world.

## Notes

1. There are a number of other excellent introductions to Serres's work that likewise use 'motivated' readings. See Assad (1993), where she argues that in order to approach Serres's writing one needs to take an approach grounded in the mathematical theory of complex systems, or Brown (2002), where he focuses on the topics of information, translation and science and culture that runs throughout Serres's work.

2. I have given three definitions of the parasite here as a way to introduce Serres's use of etymology. It is possible though to arrive at more nuanced definitions of Serres's parasite. See, for instance, Steve Brown (2013), where he gives six definitions.

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