

The machinic and experimental regimes of bodies

Draft. Please do not quote without authorisation.

Grégoire Wallenborn

EDF-DEMAND & Université Libre de Bruxelles

Abstract

We are now in the Anthropocene epoch. The “we” does not concern only humanity but all living on earth. The biosphere is affected by multiple material flows in acceleration: carbon, nitrogen, concrete, steel, crops turned into meat, electronics, cars, planes, etc. The history of life seems to be on the threshold of a major event, as it has known others in its long history. The number of possible habitats for humans will most likely decrease. Is it possible to accompany these changes, and is it even possible to steer them? Steering the “Earth system” involves a form of intention, continuous attention to a specific task. The intention is a planned action, a plan to fix things so that they happen as desired. The idea of steering supposes a continuous monitoring of objects, bodies and material flows. Is it really possible to steer the Anthropocene practices and its multiple material flows?

The asked question for this DEMAND workshop concerns the relationship between practices and energy demand, and the possibility to steer them. Insofar as the Anthropocene is primarily an issue of material flows, I suggest to focus on the material aspects of practices in connection with energy produced, demanded and consumed. I take a particular version of the theory of practices in which energy demand can be described only with bodies and machines connected by infrastructures. By infrastructures, I mean roads, electrical system and other material circulation networks necessary to the reproduction of practices. I show that if the ontology of practice consists of machines, body and infrastructure, two specific regimes of bodies can be observed and felt, and that they offer two contrasting views on the notion of “steering”.

Steering Anthropocene practices

We have entered the Anthropocene (a term popularized by Paul Crutzen, an atmospheric chemist, and Eugene Stoermer, a marine biologist in 2000) which distinguishes itself by the paradoxical tension between, on the one hand, the rise of human power to geological levels and, on the other hand, an analysis that dislodges humans from the centre of agency (Clark 2014). As Oliver Morton (2009) remarks, humans have risen to the height of the telluric forces. The author uses the power unit (terawatt) to compare the importance of different phenomena. Today humans and their machines expend energy at 13 TW (this would amount to 100 TW if everyone matched the USA level), which can be compared with heat flow of 40 TW coming from the centre of the earth, with the 130 TW of the net primary production of the biosphere and the 170,000 TW of solar radiation that illuminates the earth and whose about one third is reflected – solar flux upon which all exchanges of living rest.

The new power attributed to humans includes their machines and the access to energy. The development of practices based on non renewable resources is perturbing ecosystems and climates, and the decipherment of the situation implies that agency is extended to materials. The material and energy flows are degraded irreversibly, and the dynamic equilibrium of life is maintained through the external supply of solar radiation. The current climate change is very likely to significantly affect habitat while reducing their number. The habitats will dramatically change. As will change the ways to extract, produce, distribute, consume, decompose and recompose the materials of human daily lives. The challenge of the Anthropocene is not the “disappearance of the human species” but the modes of organization, production, circulation, consumption and decomposition that could harness (direct and indirect) solar energy so that each individual (human and nonhuman) has the opportunity to lead a decent life.

Generally, modern practices are built around machines that save human labour and time. Productive practices since the nineteenth century and domestic practices since the mid-twentieth century have been quantitatively and qualitatively extended with the use of machines. The environment has been gradually built, particularly through infrastructure, to relieve human bodies of a series of tasks. The extension of the delegation of tasks to machines is unsustainable both in the amount of demanded energy and in the type of material, non-renewable, used to manufacture machinery and infrastructure. Environmental problems are generated by the transfer of various materials and elements (including carbon), and degradation of ecosystems and access to resources pose serious social problems. Therefore, sustainability can be defined as the transfer of materials and energy compatible with the reproduction of ecosystems and human bodies. This reproduction can be done through transformations if the pace of transformation is not going faster than the evolution and adaptation of species in ecosystems (themselves moving). In other words, human practices transform ecosystems but can do so as long as the rate of transformations allows practices to reproduce in the long term.

Geoinengineering rests upon the assumption that the earth can be steered because climate is conceived as the effect of material parameters that can be controlled. Is it however possible to steer bundles of practices? To answer this question, at the epoch of the Anthropocene, I propose to take the human body as an irreducible element of any practice. Indeed, the materiality of the body gives it the attributes necessary for articulation with ecosystems and machinery. The bodies constitute the material links between practices and the environment. When a practice is described, the body is the part that interacts with the elements whose paths lead ultimately to ecosystems. To assess the role of body in practices, we can consider the following counterfactual: if the human body were different (e.g. size, needs, longevity or reproductive rate), what would have been sustainable practices? The problem that intersects sustainability and the body examines the possible combinations of the number of human bodies with how these bodies mobilize material elements to accomplish practices. Since the number of humans is difficult to change, or at least changes more slowly than the practices, it is the latter that must be adapted. It should be noted that practices concerns all activities of the body as much in acts of production as in consumption. When the sociology of consumption takes hold of the practice theory, it tends to forget the production and consumption linkages.

If bodies produce and maintain the machines, they also shape humans, their lifestyle and their practices: bodies are designed by available objects. In addition, a social practice is always carried out by a human body: keep warm, move, speak, write or read. I can write this text because I have a body, and you can only read it because you have one also. Therefore,

contrary to most current theories of practice where the body is a material component among others (Schatzki 2002, Shove et al. 2012), I consider that the human body is at the centre of practice. This gesture is dictated by the symmetry to be laid down between humans and technical objects: the body and the machines meet in energy consumption. So, the constructed ontology relegates the skills that human agents possess and the meanings they give to their practices to a secondary plan, but it offers new perspectives on the relationship between practices and energy demand.

Although the body and the machines have very different methods of reproduction, their connection is needed to develop a theory of action in which agency is distributed (Wilhite 2012). Bodies and machines act, sometimes together, sometimes relatively independently of each other. In the following sections, I begin by looking at the relationship between bodies and machines and how the infrastructures involved in the reproduction of practices. This then allows me to describe two regimes of the body: a machinic regime in which bodies are indistinguishable from machines, and an experimental regime in which bodies possess an articulated language that enables them to enunciate narratives and to propose new situations. I conclude by showing what this implies from the point of view of steering practices and energy demand.

Assembling bodies and machines

What brings body and machines closer? And to which respect are they completely separate? Both machines and bodies consume energy, by definition for the machine and by evidence for the living body, whether human or non-human. However, quite obviously, the bodies are organic, fed by an organic diet. The machines are however assemblages compound of strange minerals (iron is even an amazing invention) and which require channelled energy.

Bodies and machines are the fundamental entities of a practice ontology in which energy demand is explicit because it is they who are *active*. This activity occurs due to energy consumption, mainly exosomatic in contemporary practices (Georgescu-Roegen 1971). (The very fact of characterizing a consumption of endo- or exosomatic signals the importance given to the body as a unit of sense of practices.) An activity occurs because energy is consumed. But this activity is not just energy consumption since it takes place in a certain social configuration, connected on material flows and which redistributes materials and products. I call “assemblage” this configuration made of bodies and machines that converts energy and material flows. Any activity is a transformation of energy and can be circumscribed in an assemblage. Indeed, if the activity of a machine is observed during a sufficiently long time, if one seeks to understand how it works, sooner or later one will come across humans. An assemblage crosses several production-consumption chains in which energy or variously durable goods circulate.

The comparison between machines and bodies is needed to understand the assemblages in which energy consumption happens. The analysis of the evolution of energy production and demand would be absurd if no human were present. The machines do not work alone, and hopefully they work to produce results considered as useful. The machines are in relationships with human bodies. Rather than looking at individuals, the analysis of energy flows invites us to consider the material dimension of consumption. The notion of body permits to connect the ecological and technological ontologies. Machines and human bodies are assembled in networks of energy production and consumption – to which should be joined all the material flows that run in these networks and in others. In the practice ontology, energy is analysed through a network of interconnected things and agents. Infrastructures are

the physical parts of the organization mode of a society: they have the ability to make bodies act in a certain direction. Going from factories to homes, the relationships between bodies and machines have considerably changed and diversified. The standardization of practices is the result of co-evolution of three types of relationships: between the machines and the bodies, between machines and socio-technical systems and between socio-technical systems and bodily habits. Practices have been developed by delegating activities to an increasing number of machines and technical networks.

Infrastructures make existing modern practices, based on important energy flows. Infrastructures evolve but are stable at the scale of a practice performance. Practices pass, infrastructures last. We then understand better how practices are “scripted” by the production-consumption chains: a significant part of the activity is provided by infrastructures specifically designed to capture bodies, to make them possible other activities. The making of an “easy life” amounts to a greater complication of the machines and of their relationships. The practices pass, but they are recognizable notably by particular types of machines that compound them. When a practice is considered as an entity, it is an assemblage that can be reproduced across time and space.

Bodies and machines are interconnected in infrastructures. A practice may require a limited number of tools, machines or logistic means, but as soon as it demands energy obtained in a market it calls up extensive networks. When a machine is present in a practice, at least two production-consumption chains coexist: distribution network of the machine and distribution network of the energy needed to operate the machine. In some practices, the production-consumption chains are more numerous, for example by combining electricity, gas, telecommunications and all related machines. And the Internet of Objects promises to cross even more distribution networks.

The evolution of practices must be able to explain the evolution of energy demand. But this demand does not happen without a demand for machinery and infrastructure. Bodies are increasingly equipped, more recently with electronics (which requires a power source). They evolve with machines and infrastructures. Tools are active only if they are acted upon by bodies or machines (or a combination of both). From this point of view, the increase in energy demand is a symptom of the material extensions of human societies. In these extensions, the body is generally forgotten. Bodies seem flooded within the machines.

In the ontology of practice, bodies and machines are intertwined, requiring special properties of the two types of entities to be brought closer and sometimes to erase their distinction during an activity. An important feature of assemblages is the fact that agency is distributed between the body and machines. This implies that the bodies have the dual ability to be sometimes similar to machines and material objects, and sometimes able to be affected and oriented towards experience. In its machinic side, consumption is a use of resources for reproducing activities. But in its affective and experiential side, consumption is a production of new relationships, a performance and an achievement.

The machinic regime of bodies

To give its place to the objects and machines, relationships between human and nonhuman should be symmetrised, as suggested by the Science and Technology Studies. As one can analyse an action as an interaction between humans mediated by objects, it is likewise possible to substitute to this inter-subjectivity an “inter-objectivity” (Latour 1996) in which the objects are actors and possess then an agency. Objects and technological systems are then agentive insofar as they direct (to varying degrees) practices. Better, objects have the power to

recruit practitioners by offering new services, as shown by the example of mobile telephony and its transformation to smart phones whose “apps” seem unlimited. Objects evolve at their pace and it is important to catch this history to understand the problem of energy demand. When objects are seen as centres of action, they are extended to infrastructures because relationships with other objects can be followed. Objects are coordinated via infrastructures and the materialised standards that they presuppose. Given the important weight of the assembled objects, we better understand the ability of supply systems to steer demand patterns. However, technology is constantly changing, making and breaking connections between objects, allowing us to conceive the possibility of a theory of transition or practice evolution.

Of course, re-centring the analysis on objects only makes sense if it is seen as complementary to the analysis of humans. The essential contribution of STS and in particular the ANT is to consider alliances between heterogeneous entities, human and nonhuman. A network is formed by the association chains that make existing a technical object. The object works through all the beings who were recruited at one time or another. All beings that have been rallied are not necessarily co-present to the operation of the object but they have left a mark that is located in the stability of network associations. An object will be all the more stable as the associations will be reliable and that its network will be extended. The configuration is not that of an individual in front of a society, but of a network of associations whose strength is tested during each use of the object. In such a network, the demand for energy and agency is distributed between humans and objects. The actor network theory considers a socio-technical network as the assemblage of the multiple human and non-human actors that are coordinated within. If we take the example of the electricity grid, we will find not only power plants, wind turbines, cables, transformers, washing machines, lamps, etc., but also a series of (human and nonhuman) operators that take decisions at every moment according to rules, prices established in markets and, of course, multiple users. This network makes electricity existing in multiple practices and it is precisely characterized by this energy flow.

In the practice ontology I suggest, bodies and machines are intertwined. Of course, machines are built to be compatible with the human body, or some of its parts (hands, fingers, eyes, etc.). Besides technical standards, ergonomics imposes a number of other constraints on machines. Practices are remarkable by the fact that the distinction between body and machine is relative and even sometimes disappears. Bodies are endowed with plasticity which allows them to move along the machine. The use of a new machine requires an appropriation process, that is to say a way for the body to be one with the machine when the latter is used. During an apprenticeship, gestures are gradually incorporated. In addition, the body is plastic enough to accommodate sometimes an impersonal process sometimes a personality. Many everyday actions performed without the need to assign them an individual subject. Rouse (2007) notes that this way of thinking practices as activities that pre-exist any subject can be identified in Heidegger and Foucault.

Most practice theorists would identify these performances as the actions of individual agents. Some theorists influenced by Heidegger, however, would emphasize that the “who” performing most basic, everyday human activities is anonymous and undifferentiated, rather than being an already individuated subject or self. Individuation and responsibility only takes place against the background of these anonymous performances. Foucault and many of those he influenced go further in identifying the individual subject as something constituted by rather than underlying and presupposed by actions or performances. Butler [1989] succinctly exemplifies such a theoretical approach: “gender is always a doing, though not a doing by a subject who might be said to preexist the deed... There is no gender identity behind the

expressions of gender; that identity is performatively constituted by the very “expressions” that are said to be its results. (Rouse 2007)

From this point of view, the practices create subject and, I add, bodies. Bodies are both located in production-consumption networks and constituted by these networks. Bodies are reproduced in the practices, but not only in the sense of material continuity since it is also their identity that is replayed. Many practices are impersonal. This is especially noticeable when the interactions between the body and the machines are routine. In this way, bodies and machines are attributed the same characteristics: the ability to repeat the same tasks. The body and the machines can coordinate because the two types of entity have routines. Automatic accomplishments can do without conscience. Bodies have the ability to erase some of their properties to level themselves to the machines. The default mode of the body involvement is routine and habit, which can be seen as incorporated procedures.

The body is not merely interactive with its surroundings, but “intimately” involved with it, so as to efface any sharp boundary between them. When one’s skillful responsiveness is involved with the bodily performances of others, we get not the transmission of a skill from one agent to another, but the “dialogical” shaping of action, such that it is “effected by an integrated, nonindividual agent”. (Rouse 2007)

The interaction of a body with its environment is not just an external relationship between two clearly defined areas, but an intimate composition of heterogeneous entities. The practice takes place by deletion of clear boundaries between the elements that it actively ties. This obviously requires a familiar environment. Machines can handle the repetitive tasks of daily life. Here is how Thévenot defines this “regime of familiarity”:

‘Intimate’ familiarization evokes a direct corporal implication, the idea of a tight union between bodily gestures and an environment which makes for highly local convenience. The dynamics of the relationship between the human and nonhuman entities which compose familiar surroundings are highly dependent on personal and local clues that were made out as salient features for adjustment in the commerce with all these familiar beings. In this regime, agents are guided by a wide range of sensorial data, including not only visual but also tactile, auditory, and olfactory clues, as well as indications from spatial positioning. (Thévenot 2001)

Laurent Thévenot defines agency as the movement of an agent and the way the environment responds to it. The skilfulness of the human agent consists in her ability to adapt herself to the environment and to take initiatives. She has “models of activity” that she uses to control what happens to her.

My contention is that coordination with other human beings (and oneself, from one moment to the next) presupposes that the agent makes use of models of activity to take hold of what happens. What is at stake is not simply a matter of ‘representation’ or ‘interpretation’: these models are used to monitor one’s own conduct and are put to the test of effective coordination with other beings (or oneself) and with the material world. (Thévenot 2001)

When performing a practice, perception is oriented towards experience according to a model of activity. Perceptions and sensations form the immediate feedback of the activity: the body is self-observing and continually adapting to a changing environment. The property of the body to be able to get in a machinic regime, to acquire new routines is possible because the machines take a part of the activity. Practices reproduce themselves even better that they adjust easily to machines. The practices follow on because they fit the activities of bodies and machines to each other. There are many nuances and contrasts between the permanent regime of interaction with a machine (car, computer) and the total delegation regime (automation of switching on and off). Many actions are done automatically, which

makes bodies and machines similar. On the other hand, at the slightest alarm, gestures can exit the automatic and machinic regime. It is important to note that even when habits are installed, the activities are not subject to mechanical determinism. The unexpected can always arise in the most complete routines and body reactions are then equally unpredictable. A practice that looks like a routine can conceal micro-creations that make it evolve slowly (Certeau, Giard, and Mayol 1994).

The experimental regime of the bodies

The daily life of a body is made of a series of practices, social units that give meaning to the sequence of gestures, movements, manipulation of objects and spoken words. But is it the same body that is involved in subsequent practices? Indeed, its properties seem to vary for each practice. The same body may also be involved in several practices simultaneously: eating and discussing; tinkering, smoking and listening to music; driving a car, calling and drinking, etc. What ensures the continuity of body experiences? How is it that the body is involved in several different practices?

The human body has the ability to be both a material object like any other, a simple machine, and a lived intensity, affected by and oriented towards experience. The body can be more machinic at some moments, more intense at others. This distinction is not based on any notion of effort, an expenditure of energy, but is rooted in two distinct memories (Bergson 1896). A machinic memory, which has incorporated the models of activity, is action oriented. A narrative memory, collection of memories and impressions, is oriented towards the unity of the body. Bodies are active entities in practice and are the sites of habits and transformations. How do certain habits develop? How can new situations happen to a body?

We can answer the first question by highlighting how routine and reproduction of daily life corresponds to an incorporation of gestures (Wallenborn and Wilhite 2014). Perceptions that allow adjustments of the body and the conduct of the action can be selected (therefore learned) to reproduce at best an activity. The training of the body reinforces a memory it contains. We can learn to play a musical instrument, so that the machinic body expresses as accurately as possible a score (which is an explicit model of activity). Many implicit knowledge, skills and know-how orient actions. When perceptions are properly modelled, they immediately adjust the activities. The body is extended to all the elements that make up its activity (Wallenborn 2013). And when the relationship between body and machine crystallize, and congeal into habits, practices are essentially defined by the chains of production and consumption. The body is then a simple link in a network that, a cog which seems lifeless; a simple activity among others.

Besides its machinic aspects, the body can also orient itself towards new experiences. Another memory, made of singular memories, of concrete situations, but also of various knowledge, acts as an infinite resource for variations for tests and new attempts. This memory is expressed in an articulated language, with syntax, and is able to enunciate a narrative. This language of body allows him to repeat "I", to constitute a narrative in which he is the unity of action. Unless failure, narratives have the property of being reproduced "at will". The narrative that the body makes of himself is performative: the enunciation of the unity of the body is identical to its verification. The narrative memory is oriented towards the unity of the body, to the reproduction of his narrative. Of course, the syntax that sets the body experiences is approximate. However, it is useful for the reproduction and transmission of knowledge and activities.

Oral narratives evolve with their repetition: narratives that a body gives to himself is evolving and changing. Bodies and narratives can evolve together so that the narratives are always those of the same body. In addition to the formation of the unity of body, words are also used to collect intensities, to sharpen perceptions. The body experimenting a situation, which is on the lookout for novelty that may arise from routine, is the site for varying intensities. These intensities belong to the body which experiences his own life, but are not necessarily closely linked to body movements. The relationship between experience and intensity would require further exploration, especially because power and intensity are often confused.

The machinic regime corresponds to the reproductive side of consumption. The body then makes use of resources to reproduce and degrade materials and energy: emissions, waste, wear, etc. On the other side, the experimental regime compounds heterogeneous elements to transform them into an enjoyment, something else whose experience is worth. The body is then an intensity keen on itself that converts energy and materials. The act of consumption is a conversion of resources, and it is always both experimental and machinic. Resources are channelled, each at its own pace, towards practices that transform them into, on the one hand, waste and pollution that degrade the environment, and on the other hand, a production of meaning or a reproduction of experiences.

Conclusion: two ways of steering practices

Steering involves a continuous attention to an ongoing action with the intention of carrying it out. This activity leaves overshadowed other issues. If the steering concerns a boat or the spaceship Earth, it is worth asking how the boat was built, who is on board, what the passengers are doing and what allows the ship to continue indefinitely its journey. Steering means to focus on a particular activity, while the others are left to themselves. Steering is close to an experimental regime in which feedback is constantly adjusting the trajectory, whereas machinic regimes are forgotten. The will to steer social practices seems foolish as the steering is as much distributed that the practices themselves. However, both machinic and experimental regimes of the body lead to design very different types of intervention.

The machinic regime is mostly scripted by infrastructure and material configurations. The machines have been gradually developed to run in automated regimes in which the body can adapt. The steering of practices is then possible through the configuration of the infrastructure, the access to various resources shaping equipment and the creation of interfaces between machines and body. What could other infrastructures be? The Anthropocene should not be thought as the necessity to steer the Earth system, but as the need to explore other infrastructures, as new ways of using resources. The term “resource” is itself ambiguous since it refers to a stock, a reserve of money, material, staff and other assets that can be used by a person or an organization to perpetuate (or expand) its activities. However, resources have themselves to be reproduced concomitantly to practices. Practices consist of the reproduction of activities that is possible to identify and name according to a set of experiences. In the particular version of practice theory that I have explored, practices require bodies, machines and infrastructures to reproduce themselves. The bodies are central because they bear both the skills necessary for the proper conduct of activities and the ability to name their experiences. The bodies are reproduced in practices but at the same time, practices are activities that “pass” on the body.

A practice theory has the ability to make coexisting the same experience under two very different forms: a practice can be both an entity and a process. These are two views on the same activity that correspond to distinct properties of the body – namely properties that the theory attributes to the body so that they reflect experiences. On the one hand, practice as an entity easily fits in a machinic operation. It is easy to imagine assemblages of bodies and machines that are crossed and animated by energy and material flows. On the other hand, a practice is the experience itself as it is process of self-appropriation of the body. It can then be oriented towards experimentation of new situations.

Steering practices in the experimental regime involves exposing the body to new situations and experiences. And experience begins with words. The language – a peculiar capacity of the human body – is very useful for cutting the reality of the experience into words, statements and proposals, and then to suggest new experiences. It is also very valuable for the identification of certain practices and the development of models of activity. Indeed, it associates a unique assemblage and a set of observed or imagined activities in the same unit of sense. A practice can be observed since it is repeated across time and space. But every practice is different from any other, and thus from itself in its own reproduction. While practices as processes “drift” over time, that they differ from themselves, practice as entities are fixed in a relation of comparison. In other words, steering practices might be achieved through the shaping of infrastructures and material access to various resources, but there will always be a part of uncertainty about how bodies will react to the new configuration.

References

- Bergson, Henri. 1896. *Matière et mémoire: essai sur la relation du corps à l'esprit*. 1e éd. Bibliothèque de philosophie contemporaine. Paris: Alcan.
- Certeau, Michel de, Luce Giard, and Pierre Mayol. 1994. *Invention Du Quotidien 2. Habiter, cuisiner*. Paris: Gallimard Education.
- Clark, Nigel. 2014. “Geo-Politics and the Disaster of the Anthropocene: Geo-Politics and the Disaster of the Anthropocene.” *The Sociological Review* 62 (June): 19–37.
- Georgescu-Roegen, Nicholas. 1971. *The Entropy Law and the Economic Process*. Cambridge, Mass.: Harvard University Press.
- Latour, Bruno. 1996. “On Interobjectivity.” *Mind, Culture, and Activity* 3 (4): 228–45.
- Morton, Oliver. 2009. *Eating the Sun: How Plants Power the Planet*. Édition : Reprint. New York: Harper Perennial.
- Rouse, Joseph. 2007. “Practice Theory.” In *Philosophy of Anthropology and Sociology*, edited by Stephen P. Turner and Mark W. Risjord, 639–81. *Handbook of the Philosophy of Science*. Amsterdam: North-Holland.
- Schatzki, Theodore R. 2002. *Site of the Social: A Philosophical Account of the Constitution of Social Life and Change*. Pennsylvania State University Press.
- Thévenot, Laurent. 2001. “Pragmatic Regimes Governing the Engagement with the World.” In *The Practice Turn in Contemporary Theory*, edited by Theodore R Schatzki, K Knorr-Cetina, and Eike von Savigny, 64–82. London; New York: Routledge.

Wallenborn, Grégoire. 2013. "Extended Bodies and the Geometry of Practices, in." In *Sustainable Practices: Social Theory and Climate Change*, edited by Elizabeth Shove and Nicola Spurling, 146–64. Routledge.

Wallenborn, Grégoire, and Harold Wilhite. 2014. "Rethinking Embodied Knowledge and Household Consumption." *Energy Research & Social Science* 1 (March): 56–64.

Wilhite, Harold. 2012. "Towards a Better Accounting of the Roles of Body, Things and Habits in Consumption." *Collegium* 12.