

Let's us not overlook the earthworm *Pontoscolex corethrurus*

« Übersehen wir den Erdwurm *Pontostocles corethrurus* nicht »
7 Hugel-Bilder und Zeichen des 21 Jahrhunderts, Berliner
Fetspiele Dschungel, pour le catalogue de l'exposition SEVEN
HILLS in Berlin (editor Jasdan Joerges), pp.17-26.

The Amazonian forest is so big that it is difficult to generalize any statement made about it. Hence, the necessity to be constantly prepared for surprising encounters and counterintuitive lessons. Take for instance the diminutive earthworm *Pontoscolex corethrurus*. Once the forest has been cut off, it may be responsible for 90% of the biomass produced by invertebrates under pastures. Those little earth-worms, as we know since Darwin who dedicated a whole volume to them, are incredible engineers and move more earth than human machinery could do. It is estimated that they are able to eat about 1.000 tons of soil per hectare every year ! The reason why this particular bio-engineer is so interesting, is because of what it does with the nice lush pasture the cattle ranchers hope to obtain in place of the impenetrable forest : *Pontoscolex corethrurus* has the custom, in some situations of deforestation, to release casts which have the very strange feature of being liquid instead of producing nice looking solid turds. Does it matter ? Yes, quite a lot because those quasi-liquid casts, after drying, end up forming a pellicule of 5 cms on the surface of the soil which is so impermeable that it blocks off entirely the oxygenation of the soil below. Thus, instead of obtaining the good grass necessary for grazing his cattle, the farmer is left with mostly unproductive vegetation ; as to below the hardened and sterile surface, only anaerobic life forms are selected since there is no oxygen available, which deeply transform the dynamic of the land. After the decrease of biodiversity due to deforestation, the earthworm manages to suppress the porosity of the land cover and this feat is obtained with an efficiency which is twice that of heavy bulldozing or the continuous trampling of cattle feet... Only termites and ants, several years later, may succeed in breaking down again the solid sterile crust allowing new grasses to root, starting again very slowly the process of regeneration —but, in the meantime, the farmers had to abandon their devastated fields and agrobusiness had to move somewhere else to mine another part of the forest.

Is it fair to say of this animal that it is the « Attila of the earthworms » because « Where *P. corethrurus* has passed, grass does not grow any more... » ? Not quite, because, if it has become so detrimental, it is only due to the disappearance of other species which, until then, and under the forest's protection, had kept it in check. We can't either deny the importance of *P. corethrurus* nor accuse it of being the cause of the soil degradation. The problem is precisely to know how to rank the relative importance of all the entities sharing the stage in the production and maintenance of an Amazonian soil.

Not an easy task, because we have to be careful in placing in a hierarchy entities such as earthworms, bulldozers, ranchers, cattles, termites. Some people

argue that they are able to do this ranking and they call « nature » such a regular ordering, going from the most important being, the cosmos, or Gaia, to the least important one. And they say that we should « defend nature ». But how to do this ranking and who should do it ? Who will play the role of the least important element in our Amazonian example ? One cannot certainly disregard for long *P. corethurus* with its incredible earth-moving activity. So we cannot say that it is « small » since its importance, in the eyes of the zoologists and soil scientists making it visible at last, cannot be overestimated. However, one cannot eliminate as insignificant the poor Nordeste farmer who has been led to believe that he will be able to scrape a living by feeding some meagre cows on this apparently lush and inexhaustible soil. So we cannot say that farmers are « small » in the order of nature and should be kept in their misery for the greater good of the Amazonian forest.

How is it possible to rank entities then ? We can go a bit further and say that the proper task of politics is to progressively compose such an ordering, what could be called a « common world ». And we can also say that those who claim that this ordering is already constituted are trying to shortcut political due process. When well-meaning militants or scientists affirm that there exist one nature and one order for ranking all entities they are stating something politically dangerous since they take for already « voted » and without debate what can only be obtained after a debate including scientists, ranchers, farmers, and all the entities they are representing. As the case of our worm indicates, when we deal with ecological matters, we discover not the order of nature, but on the contrary, a continuous reshuffling of the respective importance of the entities. Many accounts of ecological crisis told by scientists, farmers, Indians, developers, are marked by the surprising irruption of a new entities which « object » to the traditional order of things : you thought that earthworms were indispensable creature for plowing the land and increasing the porosity of the soil —well, here is one species which, once deprived of the competition provided by enough biodiversity, becomes a real Attila which sterilises the soil, forcing our knowledge of soil science to be modified and our agricultural practice to change.

One ordered nature is precisely not what is in question in ecology. This is what has led some thinkers, like Ulrich Beck, to talk about « risk society », not that, in our comfortable western daily life, we live a more dangerous existence than in the past, but because the « order of things » can no longer be pacified. The religious wars have been replaced by what could be called « science wars » : we no longer agree on who and what should be taken into account in the building of our common life. What scientific and political ecology is looking for is something entirely different from an already existing order : it is trying to precipitate the advent of one order that could be at once livable and sustainable. The main characteristic of the « order of nature » that was admired so much in classical times and which is still very much in favor with deep ecologists, is that it has always been present and should be left as much as possible undisturbed. By contrast, the order that is the goal of what could be called « political ecology » is in the future, and is not to be reached by abstaining from action, but will be generated by an even more multifarious and subtle voluntary intervention. It is this new subtlety that we all have collectively to learn —and that this exhibit tries to demonstrate.

What is responsible, for instance, for the unleashing of this Attila of earth-worms ? Is it deforestation by itself? Yes, in part because before the clearing of the forest, *P. corethurus* had so many enemies that it was unable to spread very far to develop its scorched earth policy. Our worm, however, is not bad « by nature » but through the result of historical circumstances which have rendered it so deadly dangerous. The proof of that good natured temperament, is that if, after deforestation, some trees and shrubs are planted, our worm is unable to do much mischief and is limited in its invasion by the proliferation of other worms and other invertebrates which are living under the protections of those plants roots and foliages. Associated with careful farming practices and some different plants, the worm loses its danger and may even become the efficient mediator of fertility restoration, for instance in India, where it is used for improving the soil in some tea garden plantations. Like the *pharmakon* of ancient Greece it becomes a poison or a remedy according to doses and combinations.

This is where life —human, animal, political and ecological— becomes complicated : starting with the same deforested landscape you may, in a matter of two or three years, transform the pasture either into a highly degraded waste land, or let it evolve into a sustainable garden which maintains the top soil and some biodiversity. The difference is subtle and requires to abstain again from any marked dichotomy like the one that would contrast natural versus cultivated lands, conservation versus intervention, agrobusiness versus ecotourism, etc. When the list of important and insignificant entities can no longer be established by using « one » nature, farmers and their counselors should become able to sort out propositions about what to do with their welfare and those of the plants and animals which may differ by one or several small but decisive points.

Why is it so difficult for the immigrant farmers to acquire this subtlety in sorting out propositions about what it is to live together ? Because of a huge historical misunderstanding about what is a soil and how a forest is sustained. Spanish settlers, modern day agronomists, economists, counselors of many sorts coming from Europe or North America have been used by their mythology, their experience, their knowledge, to a solid heavy top soil in which the forest grows. This is why we like forest so much and use the word « roots » to express solidity and depth. Thus, in the eyes of those people, if you take off the forest as they have been doing for millenaries ago in most of Europe, something miraculous will be left : a rich and heavy humus, the plentiful cornucopia of Mother Earth.

How could settlers understand the Amazonian ecology where everything runs in reverse, where, literally, one can say that the forest holds the soil in place and that the forest itself is held by the constant rain clouds that gives it its richness and moistures ? Even now, after decades of soil sciences, it is still a surprise to realize how poor is the Amazonian soil, except in some rare sedimentary basins which, by misfortune, have also been the place where colonizers first met the Amazon thus feeding the myth of its incredible lushness. But this Eldorado, popularized by so many glossy magazines and films, is « a veil of illusion » much like that of life for Buddha. It is only because the soil is firmly held by the trees which are constantly pumping and redistributing the rare minerals that are the object of a frenetic turn over, that it remains in place. And this itself is made possible because of the rain — often much richer in nutrients than the soil deep below—, falling from the constant clouds which shroud the covers and push the

machinery of the trees. Thus, contrary to what happens in Europe, if you cut the trees, after a few years, there is no soil left. What, in the eyes of the settlers, is the most solid cause of the forest, the topsoil, is, for at least some soil scientists, its most fragile consequence. Far from being rooted in the solid earth, as it always has been in our imagination and farming practice, the Amazonian forest is provisionally held by the roots of the trees, while the trees themselves are precariously rooted in the clouds through their perilously fragile foliage.

This is where the cultural, practical, ideological, mythical paradigm shift is so complete —and that alone goes some way toward explaining the many disasters of Amazonian agronomy: how can one Westerner imagine that such lushness is in effect the result of the turn over that has to be activated by the pumping trees and the macro and micro-fauna? Hence the mistaken advice they have been given to settlers: do in the Amazon what we have done in Europe and feed your people without threatening the land. Alas, everything here is upside down and the soil hangs from the trees which hangs from the rain.

Instead of being, as it has been thought for so long in Europe, a mainly chemical and physical reality, the Amazonian soil appears to rely on a delicate chain of active biological entities which may, depending on the circumstances, trigger very fast or completely block off the turn over, thus transforming rich soils into sterile dust and poor soils into a heaven of biological diversity.

The surprise is even more complete and the misunderstandings even deeper, if deep ecologists, reversing the prejudices of an earlier age, claim that the native Indians « respect nature » and that we should « imitate » their wisdom. Unfortunately, this change of position is exactly as ethnocentric and misguided as the bizarre idea of cutting down the trees to keep the soil intact. As many anthropologists, like Philippe Descola or Eduardo Viveiros de Castro, have shown, « nature » is not what Amazonian Indians live in. For them the Amazon is a landscape exactly as unnatural, as civilised, as domestic, as cultivated, as the outskirts of Berlin or the « urban jungle » in which this exhibit is taking place. Some botanists argue that there is probably no part of the « wild » Amazonian forest which is not the result of an intentional and voluntary seedings and gardening by the native inhabitants. As to the famous « adaptation of Indians to their environments », give them a chainsaw and you will see how they devastate their land as efficiently as *P. corethurus*...

If the native Indians are a source of wisdom for the Westerners, it is not because they « respect nature », no one does, but because they abstain from using nature as a one ordered series of element to organize their polity without due process. It is about time that we begin imitating their wisdom by begin to reassemble our political organizations without shortcutting it by the unfortunate use of nature.

Fortunately, nature is dead, the « great Pan is dead », long live the proper task of politics: the progressive composition of the common world.

Bruno Latour

(with the knowledge and remarks of Armand Chauvel & Patrick Lavelle who are not responsible for the final text)

to learn more :

Chauvel, A., Grimaldi, M., Barros, E., Blanchart, E., Desjardins, T., Sarrazin, M., & Lavelle, P. (1999). « Pasture degradation by an Amazonian earthworm ». Nature, 389:32-33.

Philippe Descola, In the Society of Nature. Native Cosmology in Amazonia, Cambridge University Press, Cambridge, (1993).

Bruno Latour, Politiques de la nature. Comment faire entrer les sciences en démocratie, La Découverte, Paris, (1999) (to be translated by Surhkamp).

Lavelle, P., Brussaard, L., & Hendrix, P. (1999). Earthworm Management in Tropical Agroecosystems. Wallingford, UK : CAB-International. 300p.

Eduardo Viveiros de Castro, The Worlds as Affect and Perspective: Nature and Culture in Amerindian Cosmologies, (in preparation).

David Western, R. Michael Wright et Shirley Strum, (ouvrage dirigé par), Natural Connections. Perspectives in Community-based Conservation, Island Press, Washington DC, (1994).