

Animot

THE OTHER PHILOSOPHY

issue thirteen / 2023



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Anjmot

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**So Long, and Thanks
for All the Fish**

Edited by Alice Benessia



Cover: Carretto/Spagna, drawing from *Questions to the Yamuna River*, 2012

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COMING HOME

The first time that Alice told us about her project for this issue – which has the ambitious task of deepening the interconnection between the realms of the living – she talked about posture: she intended to engage with people who embody this deep interconnection between worlds by the very way they probe them. A posture, a way-of-being-in-the-world, then, that questions not only the boundaries of one's discipline, but the way one knows and relates to the living.

Thus, for example, the artistic duo Caretto / Spagna listens to the very ancient voice of the Yamuna River, questioning it according to the dictates of hydromancy and drawing from it the works that make up one of the artistic contributions in this issue.

The voice of the river, in turn, is made tangible through the pen of Tim Ingold, who generously put into writing the Yamuna's questions to human beings.

Or again, in the intense dialogue between Alice Benessia and Monica Gagliano, the scientist traces the path that led her to consider herself an inextricable component of the world she was studying, allowing the need to create relationships to penetrate what should have been merely a field of study.

Similarly, David Waltner-Toews' heartfelt article challenges not only the current scientific paradigm, but also the true sense of us as monolithic beings in charge of fragmenting the world in order to understand it. Then, the suggestive

image of organism-totems emerges, around which a complex multitude of microbial societies are organized, destroying the idea that there can be life beyond interdependence.

This concept somehow resonates with the idea of *human humus* that Xavier Luján, in conversation with Chiara Sgaramella, defines as an indispensable condition for the creation of long-term projects for “regenerating the soil”.

In Cyrilla Mozenter's dazzling artistic contribution, this change of posture implies a profound acceptance of failure as an integral aspect of our humanity and an opportunity to learn from the collective process of living.

Thus, along the pages of this organism-book – which itself owes its life to the visible or invisible coexistence and conversation among scientists, artists, scholars and practitioners to whom goes all our gratitude – a re-centering of our place in the world is suggested. A re-centering of the relationships, the knowledge that we inherited and are now faltering, under the weight of all life, demanding to be taken into account.

If we follow John Berger, center does not mean a new privileged point of view, which again separates us from the rest, but “the place where a vertical line intersects a horizontal line. The vertical line is a path that leads upward to the sky and downward to the underworld. The horizontal line represents the interweaving of the world,

all the possible roads that crossed the earth to reach other places" (J. Berger, *And Our faces, My Heart, Brief as Photos*, 1984) The point where these lines cross, according to Berger, is what we can call home.

Speaking of the way in which she rediscovered herself and her work as immersed in the web of life, Gay Bradshaw writes exactly this: "that reintegration, that restoration, is me coming home."

We hope that for those who read, as for us, this issue of Animot may be a way to follow the paths of the living with confidence, and then find themselves, again and finally, at home.

We want to thank those who made this possible: the publishing house Safarà, LAV who once again allows us to print and disseminate these pages by donating part of its 5x1000, the precious contribution of Valeria De Siero for the translation of the texts.

Again, our gratitude goes to all the human totems, whose thoughts, works and words made this issue so valuable. Above all else, we thank Alice Benessia for the professionalism, intelligence and, most of all, the love she has poured into these pages.

The amusing and apocalyptic scene that gives this issue its title sees dolphins soar and leave the earth: the human species has been incapable of hearing their warnings and, until the very end, it still doesn't understand, mistaking their farewell for

a water park performance. We imagine them today, the dolphins trained to defend Russian ships in Sevastopol harbor, soaring over Crimea, deserting the futility of violence that knows no boundaries of space or species (or knows them all too well). Still, in these fugitive dolphins there is no form of bitterness, anger, hatred, and not even frustration. They dance, they sing, and before they leave, they find the time to give thanks. Aware as we are that we do not have the opportunity, and neither the wish, to fly away, we want to set ourselves up to listen with the same open spirit.

Gabi Scardi Valentina Avanzini



SO LONG, AND THANKS FOR ALL THE FISH

With this message of goodbye, dolphins leave the planet for new worlds, ascending all at once from the sea to the cosmos. Earth is about to be destroyed. They have relentlessly attempted to warn humans of the impending danger, only to realize that they were not understood. Very arrogant and not as brilliant, the human species has interpreted as a circus performance what for the dolphins was the last earnest farewell. With one of the most surreal images of the science fiction literature from the '80s, British writer and humorist Douglas Adams evokes the ridiculous inadequacy of our species to relate with otherness – in this case another animal species – to the point of not realizing its own brutal effrontery and the imminence of a collective disaster.

Four decades later, understanding the other is all the more crucial; not only the other (human and nonhuman) animal, but

also vegetal, fungus, lichen, microorganism, mineral, rock; and also river, forest, ocean, mountain; the constant flow of organic and inorganic matter that surrounds, inhabits and constitutes us. In the voices of a new and much needed relational research – beyond the divide between science and art – this issue explores how we can make silence and pay attention. How we can open a crack in the shells of our being, through which we can join the stories that the other has been telling us and with us, for thousands of millennia.

Embarking on this move means changing our most recent posture as humans, letting go of the Cartesian illusion of control and command over all others, and learning (again) how to collaborate, in service of life as a whole.

The path is always immersed in a bundle of obstacles and compromises, failures and contradictions. They indicate the moving boundaries of the territory we choose to inhabit together, and the consequences we

are ready to bear.

As we begin to make silence and listen, we quickly realize that the number of humans and nonhumans who are already embodying this different posture, consciously immersed in the web of life and already collaborating, is remarkably high.

This contribution is then only adding a tiny seed into a forest of hope.

I would like to thank Gabi Scardi and Valentina Avanzini for inviting me as editor for this issue. Every invitation is a chance to show up for an appointment. In this case, with the possibility to nourish with new stories a conversation that is at the heart of my research and practice.

My deep gratitude goes then to all the humans and nonhumans who offered their stories, sharing their own experience, wisdom and skills.

I won't be resuming or reflecting here on what you will read and see, as I would rather leave room for you to join the conversation in an open space.

Alice Benessia



Cyrilla Mozenter
the failed utopian XXVIII (fail / yellow), 2015
Industrial wool felt hand stitched with silk
thread
48.25" x 72"

THE FAILED UTOPIAN

BY CYRILLA MOZENTER

In the process of making this work, the notion of failing assumed increasing dimension.

I thought of Masaccio's fresco, *Expulsion from Paradise*, which led me to understand Adam and Eve as the first failed.

Is failure, then, not an integral aspect of our humanity?

And how do we cope with this innate problem on a moment-to-moment basis?

Rather than looking to official and impossible 'paradises' or rule books to take care of it for us.

Can failure sometimes be met with enthusiasm?

Here our adaptive bear has taken on an elongated dragon-like tail — an aid to navigate through changing conditions.

When we make work, when we do research, we want to encounter something unknown to us that also has a quality of inevitability – it couldn't have been any other way.

Resolution is a failure to be anything other than itself.

In order to evolve, it necessitates getting into trouble.

In fighting through messes, we make discoveries and our work develops.

These messes, these dangers cause fear.

To have fear is to be attentive.

Attentive is what we want to be.



Cyrilla Mozenter
creature image (red), 2014
Pencil, gouache and silk thread on a double-
layer of handmade paper
45,72 x 60,95 cm

ON PROCESS

These works hover in the space between two and three dimensions. Shapes are cut out and then inlaid (and stitched) into position not unlike marquetry, requiring exactness. The tension of the stitches causes subtle dimensional flare-ups that further animate the work.

Felt is a non-woven textile.

I only use wool felt; it is creature substance as is the silk thread with which I stitch it.

I think of the felt as compressed chaos.

This is not the fabric of rationality.

Hand stitching felt together, as I do, creates tensions in the felt, causing it to buckle, stretch, shrink and torque.

These topographical fluctuations cannot be predicted.

But also seem lawful in hindsight.

Which never ceases to amaze me.

I understand this as metaphor.

As I am stitching, I am observing what happens. With each stitch there can be a shift and that informs precisely how I make the next stitch. It is quite a suspenseful process. It necessitates a devotional stitch-by-stitch attentiveness. It is a doomed attempt at regularity.



BODIES OF KNOWLEDGE AND WISDOM: SCIENCE AS COLLABORATION AMONG BEINGS

**A CONVERSATION BETWEEN MONICA
GAGLIANO AND ALICE BENESSIA**

A.B. In your book¹, you trace back to a specific moment a turning point in your personal and professional life, when the animals you were studying made you realize that you were known.

One of the main pillars of scientific practice is the possibility, even the need, to isolate one's own inner self from the outer world of investigation, keeping an ideal neutral position. A protective wall between in and out is erected through a meticulous training. In a parallel move, the entities to be examined are taken to be devoid of any inner life, as neutral and homogeneous objects of inquiry.

It seems to me that the moment you describe was crucial, as animals dissolved both assumptions for you, at once. Could we begin from your memory of that?

M.G. We go back to the years of my PhD. I was trained as a marine scientist and plants at that time were just things in the background. I was obsessed with the ocean and animals. I was interested in ecology, not in how things work – in their molecular bits and pieces – but in the behavioral

.....
1 Monica Gagliano 2018. "Thus Spoke the Plant: A remarkable journey of groundbreaking discoveries and personal encounters with plants", North Atlantic Books, Berkeley, California

aspect of life, expressed in non-human form. I did my PhD thesis on the ecology of coral reef fishes and specifically on the role of intergenerational information, how it is shared through behavior in the relationship between moms, even grandmas, and the future generations. How healthy or stressful conditions in one generation can make someone, in the next one, more or less adaptable and flexible to change. So I was looking at how these so called parental effects are transmitted not genetically but behaviorally, in what is known today as epigenetics.

Most of my work was underwater, many hours a day for months at a time, over several years. My field site was in Australian waters, around a little island in the middle of the Great Barrier Reef, closer to the external edge. When I saw it for the first time, from the tiny plane that was flying me there, I couldn't believe how beautiful it was. Over time, I got to know that chunk of the reef in many of its details, currents, creatures. It became a very intimate place and I loved being there, as you would love your favorite path in a forest, the one where you walk everyday. Where you feel at home, your mind gets quiet and you don't have to explain anything. And of course my fish lived there. It was their home. I would meet them for hours every day, sometimes multiple times a day. As I was scuba diving, I was trying to be very quiet with my breathing out, because bubbles are noisy and I wanted to be quiet.

With time, I became intimate with them.

My eyes got trained to perceive nuances in their shape, color, movement and I could tell them apart, males from females at first, then individually. As I was looking at intergenerational phenomena, I would be observing them in pair, a male and a female, in their entire life cycle: the mating, the eggs, the hatching, and the amazing transformation of the alien-like, transparent larvae into colorful adult fish. It was a miracle to me, every time.

So this was the kind of space I was in, and that experiment, as I report in the book, was both an opening and a break, in a good way. If I think of it now, I remember the feeling of connection with animals I had when I was a child. Then, during the training process to become a scientist – for which I am grateful anyway – that part of me needed to be put in the background, because of the way in which we currently teach and practice science, as you mentioned. What we think as objectivity is required, and to be objective you have to completely discount the presence of the “other” as a being, as a subject, and think of it as the object of study.

So my fish became objects of study and yet I used to give them names – which is totally “illegal” and still everyone does it. I knew them so well. I knew that in the little reef I numbered as 12, for example, the male was a bit aggressive and the female was very calm, or that both fish in the reef number 43 were very relaxed, or very reserved and so on. I visited everyone everyday and took notes, monitoring their behavior and what kind of babies they

would be producing, in relation to social and environmental stress, responses to resources and temperature.

And of course they got to know you as well.

Yes, except I didn't know that, or I wasn't acknowledging that.

These fish are wild animals of course. They are not trained nor kept in tanks, so at the beginning they were all very suspicious, wondering who I was and what I was doing there. As I was supplementing them with food, after about a week they started to get closer and accept it. Then, later, they would come and just sit in my hand, literally, whether there was food or not. I was building personal relationships. They were individuals. I would curl my hand around them and they would be sitting there, they knew who I was. It was beautiful.

And then, at the very end of the experiment, after about three months, –I had to do what I had done many times before, a standard procedure. I had to kill them all and get “my bodies”, “my organs”, so that I could do my analysis of the liver, or the heart, or the brain, or evaluate their hormone levels, or whatever else. It was part of my job: at the end of the experiment you collect your fish and you go home, with your data.

I had applied, as usual, for ethical approval and, as the ethics was cleared, so was I.

I didn't have to take any other responsibility.

The day of gathering my data came and with no particular reason, that morning I decided to dive just to say goodbye, before collecting the fish in the afternoon. I had never done that before, in any other experiment. I didn't have any nets, any chemicals, only my usual gear.

Nobody came out. They were all hiding in their little holes, looking at me. I even tried to bribe them with some food left in my pockets, but there was something that they knew, that no food could fix. They were clearly not happy and there was nothing different on the outside, in the weather or otherwise, including my physical appearance. Except that there was a big thought in my head that was different from all the other mornings.

Your intention.

Yes, my intention to say goodbye before slaughtering them all. At that moment, as you said nicely, something came down on the outside. Some permeable membrane started to work, getting the flow going in and out. And then something came down also inside of me. It hit me and I knew exactly what it was, but then conflict emerged: "And what am I going to do with this now?" So, on one side you have these beautiful relationships, that you have been nurturing and sharing for months, and on the other side you have "I am doing my PhD, I need to get my data, I need to perform, I need to tick my boxes, I

need to get going". And what was I going to do, come out of the water and tell my supervisor: "I am sorry I didn't finish the experiment because I was feeling sorry about killing the fish"?

Funny enough, during the time I was doing my PhD, there was a girl who was a Buddhist and she would refuse to kill as part of her religious practice. She was working with marine snakes and they had to find a special project for her. And the attitude of all of us, as the other students in that cohort, was very dismissive: why doesn't she get a grip, why is she making this so difficult? If she can't kill the snakes, then she shouldn't be doing science. Instead of questioning, why are we doing this, it was more like, why is she doing that? And why isn't she conforming to the rules? If you want to do science this is how you do it. So in that moment underwater I just felt this freezing cold feeling inside: "Oh, no..." And there was guilt, of course, because I thought I was going to do it, I had to. I couldn't see any way out. And then there was this feeling of being totally powerless, wondering how I could do it differently. I didn't even know if it was possible. Anyway, I finished that dive, I came back out and I didn't tell anyone but I was a mess inside.

In that conflict, not knowing what to do, I did what I knew. I came back in the afternoon and this time I had my nets and my chemicals, the things that I needed to actually capture the fish. It was such a hard work. They fought all the way. I actually dismembered and lifted rubbles of dead

corals under which they were hiding. It was a full on fight and they were fighting for their life.

And it didn't happen before? The other times were not a fight? Or you didn't perceive it as a fight?

Or maybe I simply didn't care. It was a matter of fact: this is what you do. And normally I was getting really sneaky at catching them, without making too much of an effort. I think this time it was a struggle because I didn't really want to catch them. So maybe my inner drama played out in the exchange. Anyway, eventually I caught them all. I brought them home, gathered their organs, collected my data. And then I felt like: never again. The fish were very clear: "you have no right to do this".

A few months later, I was doing a ten-day silent meditation retreat, and I remember that half way through I felt blood dripping off my hands. I started sobbing and I spent the next two days sobbing and feeling the blood of all of the animals and everything that I had killed, ever. And the message was constantly the same. You have no right to take anybody's life. It is not for you for the taking. And that was it. That sealed it.

I had to find out how to be in the world in a more respectful way. At that time, from one day to the next, I became vegetarian. It didn't require any effort, it just happened. It was my initial compromise. And there was still my science to sort out, as I realized that there was no question that was important enough to justify me killing

another being.

Before we move to the next phase of your professional life, involving a deep relationship with plants, I would like to ask, or maybe to point out that there is also a matter of trust involved. The fish trusted you. Not only they saw you, they knew you, but also they trusted you. I encountered a way of thinking about trust years ago while talking with a philosopher at a conference. I remember him telling me that trust is when you make yourself vulnerable, in the hands of someone. He made it real for me. So, the fish deeply trusted you, they were literally putting themselves into your hands. And that trust they gave you was broken.

Absolutely, I was betraying everything.

And then, listening to your story, I am thinking that the etymology of truth and trust is the same². It seems very significant. With that in mind, in this case the scientific pursuit of experimental, objective truth becomes almost paradoxical, as it involves the breaking of trust at its foundation. So we could wonder: what kind of truth can we pursue by applying a method that implies the breaking of trust?

That's right. But as you are immersed in the process you don't know. At the time I

.....
2 *deru, *dreu, Proto-Indo-European root meaning "be firm, solid, steadfast".

just felt a sense of shame, and I didn't know how to resolve it. It was about breaking the trust not only with the fish, but also, actually, with the life supporting me. How did I dare? And you are right, what kind of understanding are we getting of life if we are pulling it apart? Life is about bringing it together, bringing the interconnections together. That's when you see the whole picture. But at the time I didn't know, what I learned in my training was how to dissect.

It seems to me that in this training process one also, in a way, breaks another kind of trust, with oneself and one's former self. As they specialize, most people lose track of their initial motivation to become scientists, which is deeply relational. When asked if they have a memory of some early inclination towards science, they usually trace it back to a sense of wonder about some natural phenomenon, or creature.

That's right. The element that comes to mind, as I am listening to you, is that what gets extracted, pulled out, is the emotional connection. Because, as you said, it comes down to "I loved animals" or "I loved nature" and that is an emotional connection. It is true for me, and for many. It is not a generic interest. It is a form of emotional pull that brings us there. Interestingly, as we remove our emotional engagement, we also discard the emotional life of the "others". The emotional life of animals is a recent acceptance, but even that is only for certain ones, not everyone.

So we extract the emotional life of animals, as you say, and then somehow we insert it back, when we measure it, we certify it. It is bizarre, if you see it that way, a little crazy even.

Exactly. Also, we put it back in our own terms. We tell them how emotional they are, in our own terms. It is the quintessential anthropocentric view. I am not interested in seeing you for who you are, I am interested in seeing you through my lens and so I'll make you what I think you are.

Anthropocentrism comes up a lot in conversations for me. I feel that it is a word that has a bad wrap, and actually it depends on how you deploy it. How can I be anything else than anthropocentric? I am human so of course I have this perspective. If it ends there, that's fine, it is not a problem. Actually it is a beginning: how do I connect with a nonhuman "other", from my human, inherently biased perspective? A different move is using anthropocentrism as a template, for evaluating and judging the "others". Even worse, for building hierarchies and putting everyone else below us, so that then they need to somehow prove themselves worthy, or be lifted. When returning the emotional life to those we took it from, we see if they check some very specific boxes. And if they don't, we don't have proof – end of story. So the dissecting continues, and it happens in many ways.

Another thing that comes to mind in this idea of anthropocentrism is

the belief that we are separate. All of it can be seen in a different way. We could contemplate the possibility that reality – the phenomenon of life – happens in between: you learn who you are by encountering others. In the relationship, you find out what it means to be human. If you take that out, your own sense of humanity is very limited.

Yes, and if you fully acknowledge that, you realize that in killing the fish over there, you are actually inflicting pain over here, in a form of self violation. In that sense, not being aware of the connection is a very pathological condition.

So the question becomes, is it possible to make science differently, taking all this into account, with a relational stance? and what does it mean? It seems to me that the choices you made since that pivotal event hss been towards dealing with these open issues. Maybe we can talk about that for a moment.

Yes, sure. First, I believe that we have to be open to explore. Science is supposed to be about searching without preconceived ideas of what we are going to find. And instead most of the research we are doing these days is directed to a particular objective. The range of questions we ask is limited. We are creating and designing experiments that are testing very specific outcomes.

Also, a more open science allows for the messiness of the emotional bodies to

enter, and it doesn't see that as a conflict, but as enriching the research that really needs to be done, the questions that should be asked. Other than my own approach, a very good example of this way of doing science comes from one of my colleagues, Barbara Smuts, who did an amazing work with baboons. She sat and spent a lot of time observing them and being there with them. At one point she said she had to become a baboon. Not becoming one of them, not understanding what it meant to be there with them could be dangerous. She could get attacked. So, to be able to be there she needed to enter, allowing her subjective experience to really permeate their space, becoming a subject among subjects. Then she could see things that would have been unimaginable within the traditional scientific ideal of neutrality. She simply wouldn't have access. So in the end she made the most interesting scientific discoveries *because* she allowed her subjectivity to come in, not in spite of that. Our emotional body and subjective experience cannot be extracted. We are delusional if we think we can. As a scientist you are there, you are never objective.

Which incidentally of course comes out of quantum mechanics, where the very notion of neutral observer loses its meaning. So the issue is at the heart of science, in a way.

That's right. And going back to Darwin, the core was about the interconnectedness of things, the continuity of forms. All of these

forms have different subjectivities, and this is worth exploring. Especially as ecologists we are looking at how different forms and subjectivities are entering, exiting, shaping each other and creating what we call environment. And plants are involved in this, obviously, as well as many “others” that we don't even consider.

For me, one of the most interesting aspects of your work is the fact that you make room for all these “others” to question, in their own terms, the way in which we look at them, the way in which we make science. And they start by questioning you in the first place. It happened with the fish and then it goes on with your experiments with plants. In your account of these experiments, there is always a moment when you realize that they are showing you things that you were not ready to see. You have to make yourself available to understand what they are actually showing you.

In time, I have been learning to *lean in* to them more and more. This *leaning in* to “others” is part of my scientific methodology. It is not against it.

For example, in one of my first experiments with plants, peas seedlings showed me that they could learn by association, responding to a neutral conditioning stimulus – a little fan at the end of a maze – just as dogs did with the bell in the famous experiment by Ivan Pavlov. As the experiment went on, I realized that I had almost missed the show.

They were actually showing me that they were learning but I couldn't see it. I was interpreting their behavior through the lens of a standard hypothetical expectation that was in fact incorrect. It didn't match how *real* pea seedlings behave³. In other words, my scientific training was not allowing me to see what was actually in front of me. I realized what was happening while being there in silence with them, in the darkroom where the experiment took place, as I was ready to give up. In that moment, when I realized “Ah, I almost missed the show”, I learned that although I was trying to be very aware of my own conditioning, my own biases from my scientific training were still there, they were still playing. And they keep sneaking on me so I need to be very alert.

So there are many layers in my experiments with plants. On one side they are showing me what they can do – remembering an event, learning by association, perceiving and emitting sound, and so on – on the other they are pointing to my own biases, helping me to

.....
3 The standard hypothetical expectation was that, without learning, half of the pea seedlings would grow to the left and half to the right of the maze. However, real peas seedlings that have been exposed to light actually always grow in the direction where they last experienced light. So, unless trained to do otherwise (the aim of the experiment) pea seedlings would grow 100 percent of the time where they were last presented light. Thus, what looked like a random 50:50 distribution (no learning) was actually about 50 percent of the seedlings overriding their innate tendency and use instead the direction of the fan as a reliable indicator of future light. For more details see Gagliano 2018.

dismantle them. And in doing that, they also allow me to appreciate where the disbelief and the hostility of some of my colleagues come from. They are where I was in that darkroom, before changing my perspective and letting go of my conditioning, even just for a moment.

What I think is unique in your practice is the fact that you apply this relational approach in a lab, a Galilean type of setup.

I am following the rules.

Yes, and because of your personal journey with plants through indigenous knowledge, you are able to have a full experience in that very controlled environment, a place that is designed to ‘extract’ experiences: a paradoxical situation that is a little miraculous, destabilizing and also subversive, in a way. Just as in the work of Barbara Smuts, bringing in your emotional body and your subjective experiences in designing and performing these experiments, allows you to ask different questions and find out things that seemed inaccessible.

They become accessible as I allow for the walls of my conditioning, even if temporarily, to come down. And then there is a possibility to see something different.

In my personal life, as you mentioned, I have done work that has demanded total surrender – that is the only way to do it – to a process or to another that is nonhuman,

a plant. I have been exercising to that form of surrendering, which then allows me to call in that training when it’s time to pull the veil down now – so to speak: to open up to what is actually happening. Just as I resort to my scientific training when I design the experiment. I guess in that sense I inhabit a world that is a little bit wider maybe than the one of traditional academic setting, and in this world there are more possibilities, more questions and also more answers that I can explore.

We are taught that when we do science, we are the knowers who gather knowledge and then deliver it to someone else, and that is how we advance. But what if we didn’t have to do all of this work by ourselves – it sounds so exhausting! What if instead we were collaborating? And what if we were collaborating with “others” that have different kinds of knowledge, plants in my case – but also other animals, even land, rivers, the planet, whatever we want. What if we were to really open to the fact that we can collaborate with these “others”, that they would be just happy to collaborate with us. Suddenly it would become a much lighter job, with all this support, all these different bodies of knowledge and wisdom becoming available. It would make science a totally different affair, which maybe it is closer to what it was supposed to be in the first place, a collective, even playful exploration of the unknown.

The cave paintings of our origins come to my mind, at Lascaux for example. They evoke a fundamental impulse

to understand, to share – with these “others” – the mystery of being alive, in a form, for a tiny fraction of time. The openness you talk about, to collaborate, to approach together this mystery, could become a way to learn how to thrive collectively, as much as possible, not only to survive. Moving all together towards a realization of the common Self⁴.

Exactly.

This is related to the last thing that I wanted to talk about, which is the relationship between knowing and acting. Despite its clear empirical inadequacy, the modern ideal of science speaking truth to power, and power then acting for the common good, is still present in our culture. It is the ingenuous belief that once we know something in the language of science, which is supposedly objective, exhaustive and universal, then the right normative action – ethical, political, legal – follows inexorably, as a rational demonstration.

In terms of your work, once we have proved in scientific terms that living beings without a nervous system and a brain – such as plants – can manifest behaviors that we normally ascribe to cognition, we are then supposed change

our normative stance – and therefore the way we act towards them – as inevitable consequence.

Clearly it doesn't happen, just as with animals, and more generally with any of global crises we are facing at the moment. In light of what we talked about, we could argue that scientific knowledge in itself doesn't do the job because it is produced in isolation, by extracting the emotional and physical experience. Then it is given back as information, namely to our mind only, so it doesn't induce change. What are your thoughts about it? What kind of research practice could trigger some form of collective transformation in our way of being in the world?

What is coming to mind is our understanding of what knowledge is and what it does, on one side, and wisdom on the other. They are two very different things, obviously. My feeling is that in our cultural roots the search was about wising up, not about collecting facts. The drive was a curiosity for what this is all about, the mystery as you said. I think that anybody who delve into that mystery, the alchemy of this life, will inevitably end up in strange places, in places that are supposed to be strange, so that they break down the preconceived idea of what you think you know. So it is almost as if knowledge is there to be broken down, so that then you can grow. Instead we are using science to pile up knowledge. We are never breaking it down and growing through the process.

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4 In this regard, see for example the principle of Self-Realization, or realization of the ecological Self, in the perspective of deep ecology by Arne Naess, in his book: “Ecology, Community and Lifestyle”, Cambridge University Press 1989.

In the disruption of knowledge there are opportunities for wising it up, and wisdom is what we really need right now, more than ever.

Ultimately for me science is just one channel of exploring, it is a performance. You used before the word, “performing an experiment”: for me it is literally a performance. And when you are preparing for a performance, a theatrical performance, an artistic performance, you look at all the possibilities that you can explore to make that thing become something different.

To transcend its boundaries, in a way.

Exactly. And instead we do precisely the opposite. We keep making experiments that fit as much as possible with what we already expect, suffocating the possibility for wisdom to bubble up. And wisdom bubbles up when we are ready to give up. That is when it is presented to us: ‘here it is’.

So now it seems to me that we are circling back to trust and truth, from the other end. We could say that we have a chance of encountering some form of truth – wisdom – when we surrender, we give up our control, meaning that we trust: not only the “others”, but also ourselves. We have to be confident enough to make ourselves vulnerable, open to whatever will surface.

Yes, that’s right. So, going back to your

question, we should create spaces in which “others” can collaborate with us in developing that trust, in disrupting what we think we know. That is when wisdom typically emerges, through the embodied and shared experience of letting go. And that is how new possibilities arise, to transform our way of being in the world.

Post scriptum: Etymology

Dear Monica, today I went back to the etymology of trust and truth, to refresh my memory and make sure I got the correct information. The common etymology is *deru also *dreu-, a Proto-Indo-European root, meaning "be firm, solid, steadfast". As I kept reading, it came to my mind that another word could have the very same root: tree. I checked and yes, it is the same root. Actually, it is the main root: the way older Sanskrit *dru. So trust and truth are one, in a way, and they are rooted, quite literally, in tree. I thought you should know.

That is so beautiful! Thank you for sharing, I will ponder on this.



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TRACES CHARLES RUSSELL

In the spring of 1994, in the rain forest along the Khutzeymateen Inlet of British Columbia, I sat on a moss-covered Sitka spruce log as a female Grizzly bear walked down the log towards me¹. I knew if I did not move, she would keep coming. I had decided to let her come as close as she wanted.

Occasional slivers of sunlight penetrated the high spruce canopy. I was in a moss and jade world that, until that moment, I had only fantasized sharing with a Grizzly bear. This bear and I were not strangers. For five years I had been guiding bear watchers into the Khutzeymateen and, being uncommonly friendly, she had been one of the main attractions. Now, looking into her eyes, it seemed she wanted to push the frontiers of her experience with humans, just as I wanted to embark on something new with bears.

As she made her way down the log, she moved with a swaying nonchalance. I am certain she was trying to set me at ease. I tried to accomplish the same thing in reverse by talking to her in the calmest voice I could muster. There was an uncertain look on the bear's face, and a similar look must have been on my own.

Finally, she sat down beside me. After a time, she moved her paw along the log towards my hand and touched it very gently. [...] Even as it happened, I knew I was experiencing something that would likely change the course of my life. If I could build on this moment, correctly and ambitiously, the significance of what had just happened might have the power to change the relationship between humankind and bears. I know how that must sound—like advanced megalomania— but I still believe it is true. So much of the reputation of bears, and people's fear-dominated, love-hate relationship with them, is based on the belief that the experience I enjoyed is not possible. If I could prove that it was not a fluke, not an anomaly particular to this time and this bear, a huge shift in perception might flow from it. People might learn to live with bears in a way that would not lead to collision, violence, and the ongoing destruction of a threatened species.

I also knew in that moment that I could not back away. What was happening was something my life had been moving towards for decades, and from which I must not swerve. I had to follow where it led.

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1 Charles Russell 2002, "Grizzly Heart – Living without fear among the Brown Bears of Kamchatka", Random House of Canada, Toronto pp.1-2



THE SPACE IN BETWEEN: UNDERSTANDING LIFE WITH ANIMALS

A CONVERSATION BETWEEN G.A.
BRADSHAW AND ALICE BENESSIA

A.B. In 2020, you published “Talking with Bears: Conversations with Charlie Russell”¹. The book is the result of a long-term collaboration with Charlie Russell, a renowned, writer and photographer who passed away in 2018 after a lifetime devoted to understanding and protecting Bears². As a beginning, could you talk a little bit about Charlie and how you two met?

G.B. Charlie was brilliant – a true genius of heart and mind. He lived in Nature's skin. He grew up in Canada, in a family that was fairly hostile to Bears. They wouldn't hunt them but if a Grizzly showed up, they would shoot him down. That was the atmosphere and the beliefs he lived in. For whatever reason, Charlie saw things differently than

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1 G.A Bradshaw 2020. “Talking with Bears: Conversations with Charlie Russell”, Rocky Mountain Books.

2 Reflective of usage prevalent among many tribal peoples, as well as neuroscience's findings that treat species' differences like those of cultures, in this conversation Animal names are capitalized (e.g., Brown Bear) in keeping with capitalization of the names of human nations (e.g., Tewa). “Animal” and “Plant” are also capitalized to underscore this understanding. Although such categories retain a dualistic perspective that splits phenomena into pieces and therefore reflects a particular human cultural view—one contrary to the framing of this work and the sciences covered—this convention is used for clarity of communication.

most people. He was in many ways like a traditional Indigenous scholar, in the sense of being extremely observant and trusting his own experience. He did not have an agenda other than figuring things out. He had his own natural curiosity and an unconscious drive for uncovering truth, as he saw the disparity between his own experiences and what he was told. And he was moved by his love for Bears. One day in Kamchatka, he was out walking around with someone else's video camera, and he didn't realize that the voice recorder was on. He was enthralled with the world and came across a beautiful Brown Bear whom he did not know but felt such awe that he spontaneously exclaimed: “I love you!” That is how Charlie lived in the world. He simply lived on a foundation of truth and love. You can think of truth and love as a frame of reference, the vertical and the horizontal. I shared that frame of reference with him. It is how we clicked. Charlie appreciated that I don't use science selectively, as it is most often the case when it comes to Bears and other Animals. We respected each other because we both valued truth and were willing to follow it no matter the consequences, which if not “a revolutionary act, is at the very least, a thankless job”³. And we shared a deep love for Animals. That is why we started talking back and forth a couple times a week and never stopped, until he died.

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3 From: Charlie Russell 2018, “Giving Voice to Animals: A Naturalist's Note”, Foreword to G.A. Bradshaw 2018. “Carnivore Minds: Who These Fearsome Animals Really Are”, Yale University Press, p. 10.

We met when a mutual friend suggested that we would enjoy talking with each other. We had both just published books – mine on Elephants⁴ and his on Grizzlies⁵. Much to our surprise, we really got along and discovered how much we had in common. I think Charlie was drawn to me initially as I could be useful for the Bears. I had two PhDs, was a published scientist, and these credentials were useful because they gave collective validation to his experience. Although he was deeply respected and no one questioned his expertise, Charlie was, at the same time, unaccepted and dismissed for the reason that most people did not want to hear his message. His truth was too bitter a pill to swallow.

Let's say his message is subversive, in a way.

Yes, it undoes everything. It questions the Western grounding for objectification, exploitation and colonization by dissolving, through a deeply relational life experience, the illusion of our separation from Nature and the belief that we humans are better than Animals. This premise has no grounding, it is not even scientific by the definition of what scientists call scientific. Unlike the majority of researchers and

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4 G. A. Bradshaw 2009. "Elephants on the Edge: What Animals Teach Us About Humanity", Yale University Press.

5 Charlie Russell and Maureen Enns 2002. "Grizzly Heart: Living without fear among the brown Bears of Kamchatka", Random House of Canada.

scientists, Charlie's motivation did not come from any intellectual appetite and it wasn't extractive. It was really about understanding Bears by living with them, side by side, and showing that it was possible to coexist peacefully. In a sense, it is kind of the reverse of Western science, where through separation and objectification – the dissection of Nature - we pile up information, accumulate knowledge in bits and pieces and then say we understand.

In relation to this, in the book, you quote Charlie saying: "I never wanted to know Bears, I only wanted to understand them". If we look at the etymology of understanding, we find out that it means "standing among"⁶. Knowing something seems to imply some form of distancing and control, while understanding entails a shared experience, with no hierarchies, on common grounds.

Yes, exactly. And Charlie's motivation for understanding came from a deep emotional connection. His observations and experiences were embodied and informed his practice. His process was very organic. He paid attention. Bears weren't objects. Paying attention is "listening with your eyes", as he used to say, being present and caring deeply about whomever is around. He learned about Bears on their own time. Nothing was assumed until facts

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6 Understand as "stand among", from Old English under "between, among" (source also of Sanskrit *antar*, Latin *inter* and Greek *entera*).

were verified, mentally, emotionally and physically. His method was actually more rigorous than most conventional science. Yet, if we look at the scientific literature, it is not only rare, it is dismissed.

In what way?

People who are labeled authorities and experts on Animal Wildlife generally base their expertise on theories and ideas coming from a culture removed from Nature, “knowledge at a distance” created in an anthropocentric vacuum. For the most part, modern scientific knowledge does not come from experience, but rather from unfounded assumptions and myths⁷. In this way, Western science has an intrinsic bias because it is created in an artificial frame. For Charlie, similar to Indigenous’ perspectives, you can’t afford to have myths. It just doesn’t work. You are immediately confronted with the reality of experience. Gordon Haber is a rare example of scientist who approached learning about Nature similarly to Charlie. Haber studied Wolves in Denali, Alaska, and I talk about him and his deep respect and understanding of Gray Wolf society in my forthcoming book, “The Evolved Nest”⁸. Gordon was very uncommon because, even though he had a PhD and he came from that tradition of remove – the cultural

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7 As it is extensively shown in both “Talking with Bears” and “Carnivore Minds”.

8 Darcia Narvaez and G.A. Bradshaw, 2023. “The Evolved Nest: Nature’s way of raising children and creating connected community”, North Atlantic Books.

agenda of objectification and distancing from Nature – he, like Charlie, relied on his own observations and experience. He was informed by what he studied in school but he was open to learn from his own observations. He stands out in Western science, as he was willing to question the foundations from which he came..

How do you think that this kind of deep questioning is triggered?

I think the specifics depend on the individual, however, one can find common patterns. Anthony Storr, a well-known psychiatrist, wrote a whole book on how and why certain individuals make discoveries or create new worlds in their field by breaking the conventional paradigm from which they are born. What all of those individuals have in common is that they were somehow pulled out or derailed from the collective conveyor belts of the conditioned education that severs our common biological roots and replaces it with an agenda of separation from the rest of Nature. Charles Darwin, for example, had a relational rupture when his mother died.

What about Charlie?

Charlie was dyslexic and had a traumatic experience from a very sadistic schoolteacher. He quit in the second year of high school. I remember him telling me that if he hadn’t done that, he would have died. He knew that if he had continued his soul would have died.

And what about you? Was there an experience that shook you at the core?

No, I don't think so. I just didn't know anything different. The way I was raised was a very accepting, expansive setting, with a lot of inner freedom. If there was something significant, it was more of a reverse trauma. In the sense that I was born and felt whole, and then in my twenties I got into the conveyor belt of academia. Like Charlie, I was seeking truth and social justice. But then, I gradually realized that this was not the agenda of science and academia. The experiences in school and as a scientist caused a rupture. What saved me, in a way, is that I always functioned as an outsider. I was never invested into a particular discipline like most scholars are. My subject matter was truth and to me Western science was just a heuristic, a tool among others, not reality. It is how I am wired. I would say that through my writing and sanctuary, living immersed with Animals, I have come back to that sense of wholeness. That is embodied in the work of my nonprofit, which offers teachings and practices that seek to dissolve this traumatogenic, culturally-conditioned mindset and realign us through mindfulness and meditation - with Nature's ethics and principles. I called that return, Nature Consciousness⁹. That reintegration, that restoration, is me

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⁹ The Kerulos Center for Nonviolence was founded by G.A. Bradshaw in 2008. More about it later. See also <https://kerulos.org/>

coming home. If my mother were alive, she would say: "Sweetie, you are like your old self again".

Working with Charlie was also a form of reintegration, right?

Yes. We worked on various issues over the years and our perspectives – the things we had to say – were like good wine. They aged well with time. Charlie's death was a huge, visceral shock, even though I knew it was happening. I spoke to him the day before he died. He was going in for a procedure and we both knew that the outcome was likely his death. My first response after he died was that I had failed because I had not been able to get the book we were working on published in time. But I promised him and so I had to start all over and write it myself.

As Charlie and I began our conversations, which lasted for over nine years, we focused on using neuropsychology as a heuristic to shine a flashlight on the life and culture of Bears, through Charlie's experience. I used neuropsychology to test and evaluate if what science predicted matched with what he observed - and it did. Bears are not the unpredictable maniacs that most scientists and Wildlife biologists say, but emotionally, highly intelligent and deeply ethical beings. We found that there was scientific evidence but it wasn't enough. Neuroscience – talking about the brains, minds and all that – was insufficient. We really needed something deeper, more holistic and

more encompassing. We needed a way to talk about Charlie and the Bears' world. That required stepping out of the box and opening to a different epistemic and even ontological framing.

It seems to me, and you have talked about this, that the book was becoming not as much about the Bears *per se*, their culture and psyche, or about Charlie's life and work, but it was about the space *in between* them. So it needed a different approach.

Yes. And this was reflected in our process. At one point, we kind of stalled out. I would write stuff and we would go over and Charlie would write and we would go over, but we were not advancing. It was as if we hit a wall. To adequately communicate what Charlie and the Bears saw, did, and experienced, we needed a framework other than a conventional biological model, to make the invisible – the interactive field that Charlie and the Bears occupied – visible. Then, one day, I came across an interview that David Bohm gave at the Bohr Institute in Copenhagen and it changed everything.

As one of the founding fathers of quantum mechanics, David Bohm was another amazing character. I encountered his writings when I was working on the philosophical foundations of physics, many years ago, and I have been appreciating him since then.

Yes, I love him too. My background is in physics and math and I listen to lectures on quantum mechanics as a sort of comfort intellectual food. David Bohm was a wonderful human. Chiefly, I think, because even though he was a dedicated scientist and researcher he didn't stop there - he didn't cookie-cut his thinking to fit the conventional. He took it to the streets, literally. He cared about the world and wanted to share with people the profound implications of quantum physics. I decided to send Bohm's interview to Charlie, and asked him to just take a look. He watched it and called me, totally excited. He said that David Bohm felt like a long lost brother. It was amazing.

Indeed. In the book you quote Charlie talking about David Bohm: "There's a way of being with someone you really trust, and with that trust there is love. Then words aren't really important. You get that feeling with certain people even if you don't know them well. Watching David Bohm's interview was like being with the Bears. I get the same feeling. Questions and answers just flow [...]. Like the Bears, he asks with his eyes and the question is clear."¹⁰ Why do you think that Charlie connected so strongly with him?

I think there are many layers. First,

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¹⁰ G.A Bradshaw 2020. "Talking with Bears: Conversations with Charlie Russell", Rocky Mountain Books, p.261

David Bohm interpreted the theory of quantum mechanics as describing a radically different reality, relational at its core. That was so resonant with how Charlie experienced the world. Both of them were concerned with the space *in between*, as you mentioned, where the subject and object, the observer and the observed are inextricably one. That's how they lived their life. Another aspect is that both Charlie and David based their research on experience. They saw it as part of a whole understanding. For example, Bohm recounted an experience as a child when he was crossing a stream, relating it to an insight about the nature of reality. He described his memory of looking at the stepping-stones surfacing the water. Instead of walking on one stone and assessing the next move before making another step, he walked across in one single unbroken gesture, and it worked. He realized that movement in itself was a state of being. Charlie had practically the same experience. He recalled a specific state of mind when crossing a stream in which being and acting were one, and in complete connection with what was around him. That is how he kept his boots dry and that is how he was with Bears. It is what David Bohm ended up calling "holomovement", an unending process of unfoldment that is never static or complete,

constituting the very essence of reality¹¹. Their descriptions are incredibly similar, even though they are very different people. So, their connection ranges from a broader ontological perspective – the inherently relational essence of reality – to an epistemic perspective – not wanting to know the world but to understand it, through experience.

I relate these parallel experiences at the stream with my practice, my life with creatures in Pianpicollo, where, at times, movement becomes one with the inside and outside world. Being and acting, intention and chance, begin to resonate and blur into each other. That experience can be found and described in a variety of ways. One I recall now is in the book by Robert Pirsig "Zen and the art of motorcycle maintenance". I read it years ago and it keeps reemerging over time. In that book, Pirsig suggests that *quality* can be thought of as a relational event, in which the inner and outer space meet, they are revealed as one, and form is dissolved. It seems to me that what Charlie and David Bohm describe can be seen as occurrences of quality. They cannot be planned. One can only be prepared to greet them.

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11 In Bohm's terms: "Not only everything is changing, but all is flux. That is to say, what is, is the process of becoming itself, while all objects, events, entities, conditions, structures etc, are forms which can be abstracted from this process " David Bohm 1980, "Wholeness and the implicate order", Routledge, p.48.

Yes, they are moments of dissolution – of all the layers of thought, knowledge and perception of separation that have been accumulated and passed down, generation after generation for thousand years, conditioning the human mind. I sense that for David Bohm, and I can probably say with more authority about Charlie and certainly for myself, that the experience is really a re-entry. It is the experience of coming into a reality that has always been there, where we are part of everything and everything is part of us. To talk about these moments is very difficult because by definition they are ineffable and cannot be described with words – the whole cannot be described by the parts. Or as Buddhists say: the finger pointing at the Moon is not the Moon. As we go along this path, we have to be very mindful that there are at least two challenges that we are dealing with. One is that we are using language, which is dualistic, to describe non-dual phenomena. The other is that, as humans, we have to get used to the understanding that every moment is in fact the meeting of the non-dual and the dual, essence and form. Mindfulness or other kinds of spiritual practices can help with that. Animals – and Plants – have the same issue, but I think they are much better at it, they are at peace and live with the intrinsic contradiction. I think that humanity's path is learning how to be aware and comfortable with it. At this point, in my own ontological and epistemic journey, my feeling is that we are having to confront the constructed reality that we live in – based

on certainty, determinism and form – with a “broader” reality which is uncertain, non-deterministic, non-dual. When we dissolve all of the binary categorizations of dualism – mind / body, human / Nature, Animal, Plant, science/spirituality – we find ourselves in a no man's land. We don't have a reference. But that is the point. That is the core, the intersection of David Bohm's work with Charlie's work, with mine, but also with spiritual paths – I refer to Buddhism because that's something I'm more familiar with. All are non-dual. And the fact that things are not necessarily determined, certain, that doesn't even figure in. There is no reference point other than being right there, being present. So I would say that the commonality in these experiences and views is being present, which, in its deepest sense, breaks through all binary categorizations. We could think of a tent pole, the center pole of this tent, which we might refer to as reality. When you raise that tent, the terrain is very different and at first disorienting. When the reference frame changes to the experience of being present – which is a timeless domain – we lose our familiar scaffolding and the meaning of life takes on a very different color.

So that space in between Charlie and the Bears could be thought of as being in that terrain, around that tent pole, which we could refer to as 'Nature', with all the limitations of our dualistic language.

Yes, and that is basically how I see 'Nature': it simply is. Charlie was Nature, with the Bears. It was his home. It was his work. It was everything. He lived fitting in Nature's coherence, which can be thought of as a life of nonviolence. This is a subtle point.

Could you say a little more about what you mean?

A short story that Charlie shared with me might help. Charlie lived in Alberta, and he often went out to walk around in the mountains where he was raised. As he said, he never walked from A to B, he just went out there and wander. One day, in one of his walks, he saw a group of Deer burst out from the woods radiating out. He slowed down, curious of what was going on and saw that the Deer had stopped running and began to graze. He went a little further and saw there was a Puma who had pulled down and killed one of the Deer family members. The Puma was sitting there, eating the dead Deer. With the remaining Deer only a hundred meters away. When he recounted that story to a biologist she said, "The Deer are grazing so close to the Puma because they don't care. They don't have feelings for their family." Most biologists would say something along these lines, that Animals don't have feelings for their family, so if someone dies it's no big deal. This is not the case – neither neuroscience nor experience agrees with this incredibly ridiculous assertion. I have witnessed something similar and I saw the Deer

family watching on as one of their children was killed and being dragged away by a Puma. They were clearly aggrieved. But, first, they couldn't do anything, meaning there was no way they could prevent the killing – and the Fawn was dead. Secondly, it was not what they wanted – far from it – but they understood that it was the Puma's job. There were no hard feelings, so to speak. To me that reflects the nonviolence of the whole system. It retains coherence. That does not mean that Deer don't feel grief. But, as Charlie said, they don't have the luxury to dissociate. They don't have the luxury to mourn. They may still retain the deep sadness and sense of loss. But it all fits in. It is very different when you have to deal with mass hunting and the kind of things that Animals and Plants are subjected to by humans, which have no meaning at all. Most Bears have been shot at, at least once. When they are killed, multiple bullets are found in them. Practically all Bears have witnessed their mothers being shot or being killed. There is no meaning. It breaks Nature's coherence, or in other words, Nature's ethics and principles. That is when you get PTSD (Post Traumatic Stress Disorder).

Maybe you can talk a little bit about that, in relation to your seminal work on Elephants and the foundation of The Kerulos Center for Nonviolence?

In 1996, I was with a team of scientists that went to South Africa to study Lions. The country was trying to boost ecotourism

and wanted to bring back the Animals that had been killed off, to populate parks and reserves to make money. While there, I heard about a phenomenon happening in the Wildlife parks – the murder of about one hundred Rhinoceroses. The first assumption was that poachers had killed them to obtain and sell their horns for traditional medicine. But the horns were intact. It turned out that young male Elephants were the ones attacking the Rhinoceroses. The question was, why? I started to wonder who these Elephants were, what was going on in their minds and what was happening to them. I wanted to understand them. I applied what I knew about the human mind to Elephants and came up readily with a diagnosis of Post Traumatic Stress Disorder (PTSD). This led me to establish the field known as trans-species psychology – which is the open statement, only tacitly acknowledged in science, that all Animals including humans have essentially the same mind, brains, and capacities for thinking, feelings etc. In fact, the use of nonhuman Animals for experiments is based on this model of a single brain, mind and behavior across species.

PTSD is the only diagnosis of a mental disorder with an external cause; it happens because something has happened to you. The Elephants who committed the murders had witnessed mass killings of their families, and multiple traumas. The Rhinoceroses' killings were a consequence of the breakdown of Elephant culture and minds. I tell this story in my book

“Elephants on the Edge”. What is happening to Elephants and ALL Wildlife is a radical breach in Nature. What humans do - killing, torture etc – is not in Nature’s rulebook. It violates Life. It does not fit in the Elephants' and other Animals' sense of meaning and coherence, their Umwelt, existential narrative. PTSD is a natural response to unnatural conditions. Most people are not taking that into account. When a Bear attacks someone, the majority of time it is because he is or she is traumatized. You can look at it in purely scientific terms, very conventional science: from an evolutionary perspective, or epigenetic perspective, they are merely adapting to the environment. Animals are being forced to live in conditions to which they were not prepared and that they did not evolve to live in. They had to make this huge evolutionary jump to conditions that break the coherence of their world. That differential is what you can call the propensity for trauma. So all this led to founding my nonprofit, The Kerulos Center for Nonviolence, a sanctuary, a home to rescued Animals and a center for what we call contemplative activism, for the purpose of ending violence against Animals and promoting a radical ontological transformation of humans to nonviolence.

Using your scientific work on PTSD as a heuristic, as you mentioned, we could say that Charlie went on to demonstrate that in absence of trauma – in a place where Bears' master narrative was

relatively intact - humans could in fact live peacefully with them, right?

Yes, exactly. He went to live with Bears in the Kamchatka Peninsula for a decade. He chose that place because, relative to Canada and North America's Grizzlies Bears there seemed to be historically free of the mass hunting and persecution. He learned later that there was, in fact, a history of hunting but nothing like here, and in Europe. Relatively speaking, it was still fairly intact. His long-term personal experiment is remarkable. He was able to do raise ten traumatized Brown Bear orphans – whose mothers had been killed – and enable them to live well in their natural society and homeland. He learned through profound personal change. He took the time to understand, to listen to Bears. As he said, not many people are willing to do that, they mostly just want to get things done, get the data, the money and privilege that goes with it.

And by taking that time to understand and be changed, the space between him and the Bears was filled with trust, which brought to unforeseeable and unexplainable events from the point of view of conventional science. Maybe you can talk a little bit about one of them, about Brandy?

Yes. In his second year in Kamchatka, Charlie adopted for the first time three orphan Brown Bear cubs from a local zoo, where they were going to be killed

because they were growing up and no longer seemed entertaining to humans. After extensive research on the few existing similar attempts, Charlie decided to take them in. He brought them to his cabin in the wilderness to help them grow, become functional wild Bears and return to their homes. As the cubs were growing up, a female Brown Bear with her own cubs began to show interest in Charlie. One day, one of her cubs ran around so that Charlie ended up in between the cub and his mother. All of science says that this is a sure way for triggering a Bear attack. But, Brandy, as Charlie named her, remained completely at ease. She began enjoying their company on walks, waiting for them when they lagged. She made sure that Charlie was not left behind. Eventually, he ended up inserting himself in the line of Bears, taking the position behind Brandy and ahead of her cubs. Then, one day, out of the blue, Brandy came with her cubs and left. That was it. She left her cubs with Charlie and went off doing Bear work. And there he was with his own cubs and her cubs together: an incredible event, a breakthrough of trust. Of course, as scientists have it, a mother Bear would never leave her cubs, unless she sequestered them for safety purposes. But that day she just left her children with a human. As Charlie said, Brandy offered no invitation or questions, asking: "Are you interested in the job?" She just appointed him nanny. It lasted for seven years, three sets of Brandy's children. She would go off leaving Charlie in charge and then

come back later in the day. In my view, it speaks of her extraordinary personality, like Charlie. She wanted to get to know this guy. It is an example of how non-humans live an appreciation of diversity, but without separation and difference. There is so much more porosity in Nature, so much more fluidity. Over time, her trust for Charlie grew to the point of allowing him to make mistakes. In other words, she began teaching him about Bear ethics and etiquette. One day, Charlie recalled laughing, Brandy came down the hill roaring at him and in no uncertain terms told him he was being disrespectful. She was working, trying to get Salmon, and there he was, getting caught up playing with the kids and disrupting her work. Year after year, she was actively mentoring Charlie. He learned from her nuances about how to raise orphan Bear cubs. That is how he was grafted into the rootstock of Brown Bear wisdom.

The story of Charlie and Brandy is not a romanticized Disney's picture. It speaks at a deep level. It dissolves the Western narrative that Nature runs on the survival of the fittest. It is not about survival: it's life. Yes, in order to live, you have to survive. But living is much vaster. It is an open-ended process of mutual transformation. It is inherently relational. It takes everyone into account. It unfolds in a world cohered by love.





TRACES

DAVID BOHM

I would say that in my scientific and philosophical work, my main concern has been with understanding the nature of reality in general and of consciousness in particular as a coherent whole, which is never static or complete but which is an unending process of movement and unfoldment.¹

Tor Norretranders: Do you find that the kind of ideas that you present are easily understood in an environment like the Bohr Institute?²

Well, I haven't tried the Bohr Institute yet, I just came. But I think that scientists find it harder in some ways than many other people. Because there is a still strong commitment, even perhaps partly unconscious, to the old atomistic worldview.

So what you are saying is that science has shown us something that scientists do not want to see.

Well, they have become so used to the way of seeing it that they don't want to change it. They feel uncomfortable about changing and they feel that there is no reason to change, and many of them are saying: what we are doing is going so well now, why should we change? In one sense it looks like we are doing very well, you see, but if you look at the broader view it looks very dangerous. [...]

Where do you see the limits of the Western worldview?

It focuses too much on analysis and it tends to lead to fragmentation. What I mean by fragmentation is not just division, distinction, because the parts and the whole are correlative concepts, a part is a part only because it is the part of a whole [...]. A fragment means it is something you break up, that's the root of the word, to smash. If you smash something you would get fragments, not parts. The Western view aims at getting the 'true' parts of the universe but perhaps in some ways it gets fragments. This leads to confusion. [...]

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1 David Bohm, 1980. Wholeness and the Implicate Order, Routledge, New York, p.9

2 David Bohm at the Niels Bohr Institute in Copenhagen, 1989
Extract from the interview by Tor Norretranders, min. 2 and min. 17-20

So in the West you tend to confuse the parts with the whole?

You get confused about the parts and the whole because you take a fragment as an independent whole. [...] You see, when an observation is made, the two systems involved are not really distinct. The observer is an intrinsic part of the whole: that is what quantum mechanics is teaching us. So the observer and the observed participate in each other. You cannot therefore get an unambiguous meaning to the measurement. The same happens between human beings. If somebody tries to 'measure' somebody else, talk to him, there is a mutual change, which makes it impossible to get an unambiguous attribution of qualities.

So it is not possible to say what David Bohm would have said in another interview, tomorrow at the same time?

No it's not, because we are participating together, so what I am and do is affected by what you are and do, and vice versa. That's exactly the kind of thing that happens in quantum mechanical observations. [...]

There is a kind of communication that doesn't begin by denying this wholeness. If we say – here I am and there you are – then we have already divided it, right? But perhaps we could communicate in the spirit of the whole, without assuming that division. That means I am not trying to tell you what I think, and you are not trying to tell me, but rather together we are trying to discover how we are going to think, together. You see the difference?

Indeed. Is that possible in ordinary language?

Yes, it is. I think it depends on the attitude. Our language has been developed so as to emphasize the parts, but we can still use it differently. For example poetry uses language differently. It is always possible to use language in new ways.

So the basic obstacle is more the attitude of the people involved than the theoretical or verbal tool they use.

Yes. And you can't be forced to have a worldview, you can only really say that the evidence is such that you are convinced, and that it seems coherent to you.

The psychological attitude towards a new worldview though can be completely

opposite.

Yes, you might want to cling on to your old worldview or may feel happy that you are free from it. I think that people are becoming less satisfied with the old worldview today, generally speaking. They are not satisfied with this fragmentary view because it has led to so many problems, so much incoherence in the human relationships and society, with the ecology and so on. For example, this fragmentary view has led to treating the whole Earth as a set of fragments to be exploited, and that all adds up, in the whole, to this destruction going on. So as long as we think that way it will probably go on. People will take a fragmentary approach to repairing the ecology but it won't work



7



IMAGINATIVE SCIENCE AND TOTEMIC ECOLOGY

BY DAVID WALTNER-TOEWS

As we begin to emerge from the most recent pandemic, some deep questions remain open, becoming painfully urgent. The approach of reductionist science has framed the issue at stake as a war against an invisible enemy. We are pressed once more to think about what health means and how we can make peace with all living beings, starting from the microscopic populations that live in us, with us, from which we all come from.

What kind of science, and more generally what kind of knowledge can we develop to foster a collective health? To make peace with life around and in us?

The 1948 constitution of the World Health Organization states that health is *a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*. Notwithstanding this idealized definition, in public and professional conversations the word health is most often used as a shorthand for medically-defined conditions, that is, as the absence of diseases or infirmities. This use of disease-absence as a synecdoche for health has been encouraged by a hospital-centered system in which physicians are trained to diagnose and treat medical conditions. A complex commercial, industrial and technological network has been constructed to facilitate this approach

to diagnosis and treatment, drawing on rapid advances in what Thomas Kuhn called Normal Science, a puzzle-solving endeavour.

Fortunately, many of the determinants of health as an ideal state also apply to absence of disease. Historically and academically, health in all its forms has been understood to be associated with social conditions, as well as food, water, air, and the plant and animal environments with which people interact. These disparate determinants have been the subject of discipline-based research, and reported in many scientific, but non-medical, journals. While much of this non-diagnostic information is available, it has been fragmented, with little communication across disciplinary, departmental and professional boundaries.

There is no doubt that puzzle-solving sciences have been very successful in designing and building vaccines, antibacterial drugs, electric cars and military hardware, but have fallen far short of success when applied to ill-defined global challenges posed by wicked, interacting problems such as climate change, infectious disease pandemics, sustainable development, economic inequity, access to medical care, adequate food, and potable water.

Since the 1960s, various intellectual and organizational initiatives have attempted to rectify these shortcomings. These integrative efforts, cobbling together

information drawn from fragmented, puzzle-solving scientific research, have included health promotion, veterinary public health, ecosystem health, ecological integrity, conservation medicine, ecosystem approaches to health, and planetary health.

In the 1990s, in the wake of a world-wide resurgence of infectious diseases, the term One Health vaulted to a place of global prominence as the most recent attempt to corral a range of health-related disciplines under one tent. In 2008, for instance, an International Ministerial Conference on Avian and Pandemic Influenza in Sharm el-Sheikh, Egypt proposed that a One Health framework be used to address "infectious disease control in areas where animals, humans, and ecosystems meet." In 2016, the University of the West Indies, in collaboration with a range of international and national organizations, implemented a project titled *One Health, One Caribbean, One Love*. The specific goal of this initiative was to develop a One Health approach to zoonotic and food-borne disease surveillance, diagnosis and response. In 2015, yet another term, Planetary Health, claiming to be "solutions oriented", was introduced by a joint project of the Rockefeller Foundation and The Lancet.

These integrative initiatives have met with mixed success, at best. Indeed, the recurrent crises in food security, and the emergence of Avian Influenza, SARS, H1N1 and SARS-CoV-2, have laid

bare some fundamental problems in the foundations of the normal sciences being used as building materials for integrative organizations. In 2017, Samuel Stanley, chair of the National Science Advisory Board for Biosecurity in the United States, asserted that Nature is the ultimate terrorist, and that we must be relentless in our struggle against it¹. This understanding of Nature is reflected in almost all of our government and research institutions, from governmental science advisory boards and universities to the framing of responses to pandemics as battles whose success can only be assured with a stronger medical armamentarium. In the haste to fortify medical defence systems, alternative viewpoints have tended to be swept aside.

In an interview in May of 2020 a former Director of the Office of Public Health Preparedness and Response at the U.S. Centers for Disease Control and Prevention declared that their failure to adequately respond to the pandemic as it emerged was not a lack of scientific information or medical weaponry, but a lack of imagination.

What did this mean? Is there a science that can embrace imagination? If so, where can we find such a science?

Across a very deep intellectual and

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¹ Reardon, S. 2018. "US government lifts ban on risky pathogen research", *Nature* 553 (11) doi: <https://doi.org/10.1038/d41586-017-08837-7>

practical chasm from our normal practice of science, there is an alternative to the fragmented, mechanistic view of Nature — a view based on relational, imaginative science. In the Western world, the divide between the puzzle-solving, reductionist science practices, which we have come to view as synonymous and coterminous with science, and alternative, integrative, imaginative sciences, can be traced back at least to the 17th century. Drawing on the observations and thinking of scientists, philosophers and poets such as Alexander von Humboldt, Goethe and Schelling (the so-called “Jena group”) an organic and holistic view of Nature has largely been relegated to the arts and humanities, or to disciplines considered weak or soft, such as human behavior, communication among people and other animals, and ecology, or even, with even more scathing dismissals, to some sort of New Age fringe. Yet in the wake of the most recent pandemic, as well as crises associated with catastrophic climate change and the worldwide dramatic loss of animal and plant species, the relational and imaginative sciences emerging from that view of Nature offer a glimmer of hope for a way forward.

For the past few decades, with community members in Asia, Africa, Europe, Latin America and North America, my colleagues and I have actively pursued a variety of research methods to integrate the health of people, other animals, and the ecosystems we share. Many of these approaches attempted to bring together multiple methods and perspectives.

These included epidemiological studies, laboratory investigations, intervention studies, social action research, reading and conversing with colleagues across a wide range of disciplines, and in the spirit of Joan Didion, who stated that she wrote in order to determine what she thought, writing several books on excrement, insects, and infectious diseases. After several decades of pursuing this work, some of us have been left with the sense that this cobbling together of reductionist sciences did not result in holistic solutions.

Nevertheless, considering both the successes and the failures of this collaborative work, some possibilities of a way forward are beginning to appear.

Post Normal Science (PNS) was proposed in the early ‘90s by Silvio Funtowicz and Jerome Ravetz for situations where facts are uncertain, values are in dispute, stakes are high, and decisions are urgent. The post normal approach for dealing with these kinds of predicament – currently ubiquitous – points to an extension of the community involved in creating, sharing and applying the required relevant knowledge, drawing not exclusively from the realm of science. If we are to find a way through this century’s rubble into a liveable planet, what is required is not merely a PNS based on conversations among extended communities of people, however, but a PNS that embraces all living things, including the viral and microbial populations from which we have emerged.

Is it possible to bridge the intuitive sense of the world as organically whole, long-held in Indigenous cultures around the world – and relegated to artists, philosophers and writers in Western societies – and a science that by its nature categorizes and fragments our understanding of that world? Rather than "dropping out" to live, Zen-like, in a rapidly disappearing wilderness, or studying 'serious' (that is, reductionist) science by day and entertaining ourselves with art and music by night, as many of my scientific colleagues do, can we imagine a non-divided, non-Cartesian self and world that draws on our whole selves in the whole world?

Digging deeply into the latest puzzle-solving successes in evolutionary biology, genetics, and ecology, we come to a precipice, and end to what is knowable by reductionist science. Similarly, exploring our narratives and imaginative understanding of the microbial and pre-microbial world, we find new ways to think about disease, food, what it means to be alive, and what it means to die. In the chasm between the two ways of understanding the human predicament, the universe, to paraphrase the British geneticist J.B.S. Haldane, is not only stranger than we imagine, it is stranger than we *can* imagine. It is in this unimaginable, non-reducible space, that we discover a bridge, however fragile, across the divide between normal, post normal, and imaginative sciences.

Before there were people, before

other animals, plants, fungi, algae, there were chains of nucleotides and proteins, shimmering in a primordial sea. These are the first fragmentary memories of our collective being.

Nucleotides formed by pulling together, in various configurations, oxygen, hydrogen, phosphorus and nitrogen. They have been called the building blocks of life, a metaphor which reflects perhaps a childhood spent imagining the endless possibilities of Lego. These nucleotides further organized themselves to form nucleic acids: some of these so-called bases—which we have named adenine, cytosine, guanine, thymine—formed pairs. In Deoxyribonucleic acid (DNA), the molecule that carries genetic information for the development and functioning of an organism, two linked strands of these pairs wind around each other in what are described as double helixes, complex molecules that look, according to those that have seen them, like twisted ladders. These pairing and ladder metaphors used for describing human inheritance have warped our understanding of life and of evolutionary biology. They reflect not only the materials being observed, but also the heterosexual and engineering biases of laboratory scientists, as well as their particular perspective on biology-as-destiny.

Ribonucleic acid (RNA) is another nucleic acid, but is single stranded, in which the nucleotide uracil substituted for thymine.

In eukaryotes, such as humans, the DNA is arranged into short or long strands called genes, varying in length from a few hundred bases to millions of bases. The genes, considered to be the active parts of our DNA, are packaged into chromosomes, which are then bundled into a nucleus. The nucleus is surrounded by a membrane which, like all membranes, and all organisms in the world, like ourselves, is selectively porous. Many (perhaps most), but not all of these genes, provide the information for proteins to be made. Human cells have billions of nucleotides, and between 20,000 and 25,000 genes. If we zoom in from the genes and look at finer details, we find that only two percent of human DNA is packaged into active genes used for making proteins. Even in what most of us think of as the most stable part of ourselves, about 40-50 percent of genes are considered transposons, or jumping genes, which can move around from one location to another. Humans are unstable at our very core. Geneticists have asserted that only a very small portion of these transposons (maybe 0.05%) are active. But what activates them, or what deactivates them, we are not sure. Are they sleeper cells of a revolutionary network? What signal are they awaiting, and from whom?

RNA tends to hang around in the cytoplasm, the gelatinous liquid surrounding the nucleus, but is still inside the cell, which has its own wall protecting it from the surrounding world. Some people

have described DNA as the basic code and RNA as interpreters and messengers that translate the code into making proteins, or other quotidian needs and desires. This is a computer-business metaphor. Others, perhaps having spent too much time watching television and not enough time in the kitchen, have talked about DNA as a recipe book, and RNA as the chefs who bake the cakes and breasts and ears. Some organisms such as bacteria, called prokaryotes, don't have a nucleus, but the DNA still tends to bunch together, being translated into everyday language and the cakes of life by RNA.

Not that many decades ago it was scientific dogma that all the information—all the memories about who we are, where we came from, and indeed who we might become—was contained in the DNA in the nucleus. We now know that other small organs inside the cell, called organelles, contain their own DNA, and that these might influence phenotypes. Mitochondria, for instance, are contained in their own double membrane inside the cell, and generate the power that keeps a living cell going; they are also involved in signaling between cells, as well as apoptosis, or programmed cell-death. Mitochondria have their own DNA, which resembles the DNA we find in bacteria. In sexually reproducing organisms like ourselves, mitochondrial DNA is only transmitted through female lines of inheritance. Some small, circular DNA strands, called plasmids, float around in the cytoplasm

and occasionally genetically engineer changes that enable their hosts to survive in hostile environments.

All these various packages and strands of nucleotides in human cells are our first and most hidden memories, drawn from the primordial fragments, built into the deepest structures of who we are. There are several hypotheses about their origins, which one can frame as questions. Did the proto-viral chains predate the cells of which living things— eukaryotes and prokaryotes both – are constructed, as evidenced in the structures of their organelles and in their molecular memories? Did the free-floating chains break free from single cells? Some, we know, stayed, and contributed directly to our humanity. In the 21st century, various research teams have concluded that much of human DNA is of viral origin, and that viruses have been important drivers of human evolution.

Geneticists have struggled to find a language to describe what they think they are seeing. No single language, metaphor or narrative is sufficient to understand the nature of our origins. Biology in the 21st century is at the stage where physics stood in the eighteenth century. This makes gathering evidence for an imaginative, grounded view of Nature a challenge. Joshua Lederberg, a microbial geneticist, has lamented that “Biology is already so fact laden that it is in danger of being bogged down awaiting advances in logic and linguistics to ease the integration of

the particulars.”

In 1955, Lederberg received a Nobel prize for demonstrating that bacteria can “conjugate” and share information laterally, that is, not through inheritance, but through intimate chemical conversations. Although this has been followed by intensive research into communications among non-human organisms, such communications are poorly, fragmentedly, understood. Still, in efforts to make sense of both our biological inheritance and our awareness of it, we humans tell stories. In one narrative, the prokaryotic cells became archaea and bacteria. In diverse, polyamorous, open communities, these organisms exuberantly shared their bodily fluids and memories; some worked together, giving up pieces of themselves, in a Jean-Jacques Rousseau-like gesture of limiting freedom to become free, to become more than themselves; this, Margulis and Sagan have concluded,² is how multi-cellular organisms such as ourselves, and dinosaurs and trees and slime molds came into existence.

The Merriam-Webster dictionary defines a totem as “an object (such as an animal or plant) serving as the emblem of a family or clan and often as a reminder of its ancestry.” The word totem itself has attributed to an anglicisation of an Ojibwe-Anishinaabe term referring to a sacred

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² Margulis L. e Sagan D. (1986), “Microcosmos: Four Billion years of microbial evolution”, University of California Press, Berkeley

object, spirit, or symbol used as an emblem for a group of people.

Multicellular organisms, being objects created by communities of unicellular organisms, genetically embodying memories of their ancestors, can be considered totems. Indeed, the word itself provides a link between Indigenous (imaginative, integrative) and Western (mechanistic reductionist) views of Nature.

Around and on and in each multicellular totem, a small microscopic community grew, sharing memories, nourishment, weapons, protecting and helping the totem they had colonized. Today we refer to these supportive communities as “microbiomes”, with increasing evidence that these microbial populations communicate chemically with other cells in their totems, including those of humans. These cellular conversations contribute to immunity, plasticity, and adaptation.

The organism as totem, with its microbiome as creative, supportive community, embodies both that which can be studied and measured, and that which can be experienced but not measured. When the totems and their supportive microbiomes were shattered by asteroids and volcanoes, some, undeterred, began again.

At first hyper local, some microbiomes travelled with their organismal totems— with dinosaurs, wildebeests, elephants,

cranes, butterflies, proto-humans. Some left their home communities and travelled great distances. Through the travelling, eating and defecating practices of the totems, the microbiomes traded ideas and memories and reproductive fragments with others. In doing so, they created new colonies, new languages, new microbiomes. Some microbiomes and their totems became us—*homo not-yet-sapiens*—a Babel of unfinished achievement. They lived—they live—in us and on us. They are us. We spoke in proto-languages. We thought we were special. But others, to whom we have been oblivious, continued their own conversations beyond our comprehension.

In the early twentieth century, Jakob von Uexküll intensively studied what he called the *Umwelt* of non-human animals, by which he meant their perceived world. In these *Umwelten*, the mind of each organism interprets the world through messages it receives; the mind and the world are, to use a term from psychotherapy, co-dependent. All animals, he proposed, based on their varied and unique histories, and using their sensory and cognitive skills, create their own *Umwelt*, their spatio-temporal sense of the world. How did jellyfish, dogs, whales, ticks perceive the world in which they lived? How did different animals in the same shared environment—cats, owls, mice and birds—perceive the common spaces they inhabited? For each animal, this sense of *Umwelt* determined how they detected and responded to clues about food, predators, prey and mates.

We now refer to the field explored by von Üxküll as biosemiotics, the study of making meaning by one animal, or other living being, from signs given off by another — which could be words, behaviours, odours, chemicals, or indeed any communications, intentional or not. This is how living beings communicate and converse with each other. At the time von Üxküll pursued his studies, little was known about how animals communicated among themselves and with their environment. The messages they sent and the receptors they used were, to many scientists, unimaginable. Thus, scientists engaged in the very practice that they accused their imaginative, holistic enemies—they anthropomorphized. They assumed that whatever humans saw and heard and smelled was what the animals saw and heard and smelled. Yet, conversely, if an animal reacted to pain and pleasure in ways that resembled human reactions to similar stimuli, these same scientists argued that other organisms could not possibly be feeling those things, because they were, by definition, not us. To say so would be to anthropomorphize.

In the past century, using advanced technologies and a great deal of patience and sometimes enduring ridicule, scientists have made considerable progress in exploring how living beings perceive the world around them.

Non-human animals use complex combinations of vibrations, sounds, sights,

textures, smell, taste, electric and magnetic fields to create, explore, and respond to their *Umwelts*. Even those senses we think are easily understandable, such as sight and sound, elude human understanding because the animals detect signals far outside of the range of what humans can detect, and interpret them in the context of individual and group trajectories to which humans have been largely oblivious.

If we are beginning to sense that other animals perceive the world differently, we still imagine that humans have the one truly objective understanding of this world, what von Uexküll would call the *Umbegebung*. But how can we know this, except by that demonstrably fallible social force of agreement among peers? Beyond these *Umwelten*, we venture into the uncanny strangeness of semiospheres, where the complex signs and *Umwelten* of living beings converse and interact. A semiosphere is comparable to a biosphere, but encompassing signs and messages (movement, colours, electrical fields, chemicals) among all living organisms. If an *Umwelt* is centred on a particular organism, the semiosphere is the larger communication space in which all organisms live and experience the world.

How do the semiospheres of interacting *Umwelten* create the visible ecosystems and biosphere we can see and to some extent measure? And where do microbial populations fit in? Epidemics? Pandemics? Autochthonous and migratory

microbiomes?

In the latter part of the 20th and first decades of the 21st century, building on the work of Lederberg and others, molecular biologist Bonnie Bassler and her colleagues have expanded and deepened research into bacterial communications. It now appears that bacteria converse among themselves by freely and unabashedly sharing bodily fluids and molecules. Their language of communication is called quorum sensing. In quorum sensing, bacteria share chemical signaling molecules, called autoinducers, to create group activities; these include bioluminescence, pathogenicity, sporulation and conjugation. Quorum sensing suggests that bacteria have a sociality and can even function as if they were multicellular organisms.

This is an ur-language beyond seeing, hearing, olfaction, gustation, proprioception and touch. It is at once a plethora of tongues, but also one polyglot global language. In long, stuttering quantumly entangled conversations without borders, across lipids and membranes, below radar, beyond technology, at the very inkling edge of understanding, they share pieces of themselves, scattered memories, in plasmids, fragments of memory.

Even as the other animals, plants, fungi and bacteria around us have carried on unimagined conversations, we, the almost sapiens, obviously shared and imposed our microbiomes everywhere through our travels, our trade, our empires, our

chickens, rats, cattle, pigs and dogs. In the wake of our reckless, restless search for innovation, power, control, good health, and something we could not name, we destroyed not only entire landscapes once teaming with all kinds of fauna, flora, and organic totems not-quite-but-similar to humans, but have also heedlessly created a global McMicrobiome, a new embattled landscape of semiospheres.

Recognizing the value of the microbiomes for health, we have used puzzle-solving scientific tools to create generic responses, such as marketing probiotic pills and nutraceuticals. But what happens when generically helpful probiotics—generic answers being what science seeks—containing billions of standardized strains of lactobacilli, mix and interbreed with locally diverse microbiomes? Are we promoting microbial monocultures? Is this more of McMicrobiome? Are microbially rich fecal transplants cures, or perpetuating the problem, like chaplains and psychotherapeutic counsellors in the armed forces and prisons, or calming meditation gurus for traumatized soldiers?

Collectively, we have only paid heed when rogue viruses, bacteria, and prions, detached and marginalized from their home microbiomes and totems, often as unintended consequences of human actions such as widespread antibiotic or pesticide use, or forest clearance, have attacked us, appearing as disease, representing Nature as the enemy. We did

not understand. We could not see them. We only saw the guerrilla counter-attacks too late. We gave them names thinking that the naming of the world could save us: *Yersinia Pestis*, viruses of smallpox, measles, rinderpest, influenza, H1N1, H5N1, SARS-Coronavirus, *Salmonella*, *Staphylococcus*. We have, of course, replicated similar behaviour when encountering humans from cultures different from ours.

In the dizzying wake of 21st century gene-sequencing technology developments, much has been made, by both scientists and the general public, of the discovery that human genes are similar to those in many other species. But what are we counting? Nucleotides? Genes? DNA strands? If we compare genes, we are comparing bundles of DNA; this is like comparing households rather than individuals. Based on genes (those protein-coding packages), humans are 60% genetically similar to bananas, but based on active DNA strands, we are only 1.2% similar. On the other hand, 60% of the fruit flies' DNA code is identical to that in humans.

As part of my professional veterinary education, I learned to observe and interpret the behaviours of various non-human animals. The rationale was that a therapeutic relationship would have to be based on sharing trust between species. I discovered that sometimes, if done carefully, we can look into the eyes of elephants and dogs and great apes, and recognize some kindred being, and

even find empathy. But what exactly am I recognizing? And if I experience empathy, is this anthropomorphism? If so, is this anthropomorphism a recognition of our common origins in Darwinian evolution? Can our mutual recognition, however fragile, be attributed in part to the primordial genes we share, which for other mammals such as Abyssinian house cats and mice and cows are on the order of 80-90% or even higher? Is what we recognize in other animals our common heritage? Do we share common early childhood memories?

The focus in headliner science stories about genetic kinships is often on numbers, with the implication that the greater number of similar genetic material (whether calculated using genes or DNA), the more similar we are. But are two pilots in an airplane less important than the 300 passengers their plane is carrying? We should be asking ourselves similar questions when we interpret percentages of genetic overlap in complex or chaotic systems.

Even if we acknowledge that the percentages have some importance, can we speak to those shared DNA molecules in others—trees, mammals, birds, insects?

In a paper published in 2013, Nicholas Strausfeld and Frank Hirth³ have reported

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³ Strausfeld N. J. and Hirth F. 2013. "Deep Homology of Arthropod Central Complex and Vertebrate Basal Ganglia", *Science* 340 (6129), pp.157-161.

on what they call the deep homologies between neuro-regulation of behavior in arthropods (such as flies and crabs) and vertebrates (such as fish, mice, and humans). They have argued that we can learn a great deal about human brain disorders by studying insects. But if they are similar enough to humans to serve as laboratory subjects from which one can make inferences to humans, what does that mean in general for human interactions with other species?

Does caring for other species, including arthropods and trees as well as pets, livestock and charismatic megafauna, also offer a doorway to the possibilities of caring for the single celled organisms—the viral and bacterial bits—who inhabit all of us in various ways?

Can we empathize with bacteria and viruses by empathizing with the variety of other species or people (totems), that microbial populations have created and which they inhabit? Does this way of thinking about the world offer some hopeful pathways? Some scientists have looked to the stars for understanding and meaning, searching for what Hawking called that ineffable thing that “breathes fire into the equations.” Can the microbial world offer other ways of understanding who we are? Can we ameliorate and reverse the globalization and homogenization of bacterial social cultures before their messages are lost?

In a remarkable article published 2020, Nicole Redvers and her colleagues⁴ explore the links between individual and planetary health through indigenous narratives and knowledges, including the ones emerging at the molecular and microbial scale. Methodically and carefully, they make the arguments that “the planet’s health is a reflection of our own health and wellbeing right down to the molecular level.”

Taking a global/planetary view, rooted in localized indigenous perspectives, they offer a re-examination of the most advanced research into microbiomes to reformulate a new, all-inclusive view of One Health, one that can transcend the divisions created by Enlightenment (reductionist) science and work towards achieving the aspirations of the 1948 WHO definition at a global scale. Their proposal for molecular decolonization offers an exciting opportunity for each of us as totems, with our individual and communal microbiomes, to commit ourselves to, as one of the authors has previously declared, “becoming indigenous to the universe.”⁵

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4 Redvers N., Yellow Bird M., Quinn D., Yunkaporta T. and Arabena, K. 2020. “Molecular Decolonization: An Indigenous Microcosm Perspective of Planetary Health”, *Int. J. Environ. Res. Public Health*, 17 (12) 4586.

5 Arabena, K. 2015. “Becoming Indigenous to the Universe”. Melbourne: Australian Scholarly Publishing Pty Ltd

Post Scriptum

As I attempt to formulate clear thoughts about this, I wonder who this thinking “I” is. Am I not like Ulysses a part of all that I have met, as well as the sum of my cultural and genetic past? If so, how far back and how deep do I explore? When I write and speak, for whom I am writing and speaking? Are claims beyond my “self” appropriations of voice? I do not speak for multi-gendered homo sapiens, nor for men at large, nor for white-skinned settlers. I cannot claim to give a voice to my contested left-wing Anabaptist, or earlier Celtic or Viking genes, some of which have in any case been corrupted by cryptic viruses, or washed up by nucleotides, inscrutable, junk or non-coding or marginalized DNA, into the pews beside me, or on the strand to or from which they fled or arrived in leaky boats, nor do I speak for the various and sundry lands in which my people settled after some terrible calamity befell the ancestors of those who were not us, who had arrived well before us, then left or were marginalized or disappeared.

I do not speak for trillions of bacteria who cloak my skin, repelling friends and enemies,

attracting hawkers of lotions and perfumes, nor even for my gut microbiome, who to my dumb embarrassment at inopportune moments speak loudly for themselves.

Perhaps I speak for communities of

viruses, archaea, bacteria in my cells, who have no voice, yet who are my tongue, are my own bumbling self, who gave up who they were, to live in me as nucleotides, stem cells, neurons, and mother-blaming mitochondria.

In fact—if one can here speak of fact as if that were a thing—I cannot rightly claim to speak for them. Autochthonously, pan-dancing, they have become who I am, embodied, here, and now. They give voice to the impossible consciousness and memories of me, what my body remembers, or hides, and what beyond all this remains unspoken.





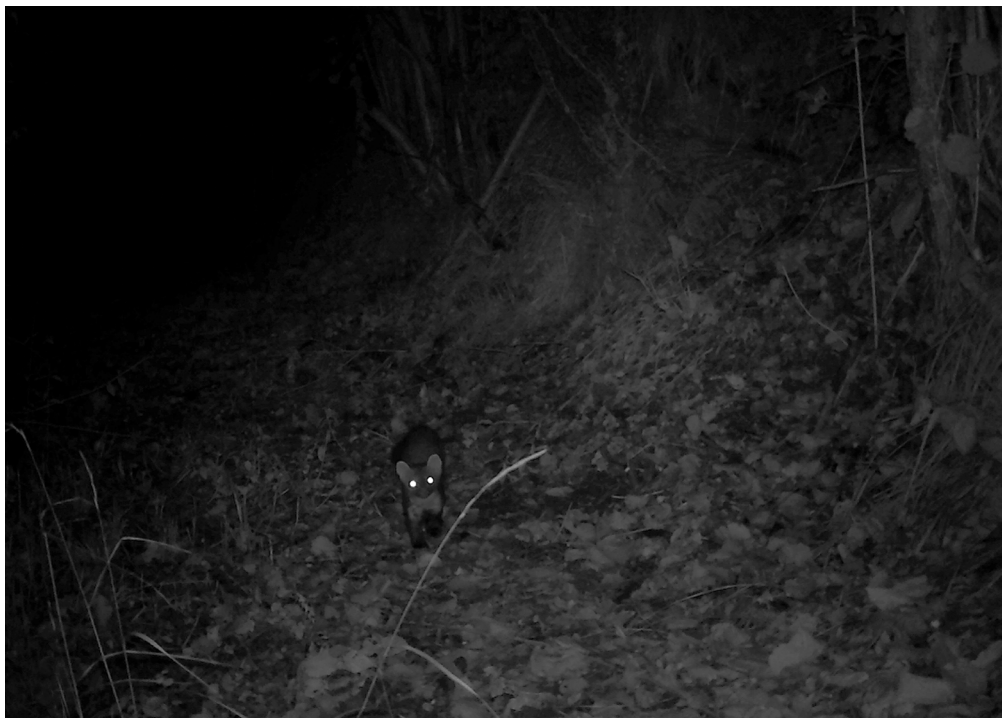
TRACES

RAIMON PANIKKAR

This sense of sacredness of life: [...] every being is sacred. And thus the dignity of every thing cannot be violated. And thus, if you want my opinion – which could be questionable but it is my opinion: It is a matter of sensibility, not of reasoning. I suffer the fusion and the fission, the breaking of the atom, the indivisible, as a violation of the sacredness of matter. Even before thinking if it is for peace or for war, for the bomb or for the energy: it is the same. We have lost this respect for the dignity of matter, and then – evidently – we end up going where we are going. The problem is not the atomic bomb *per se*. No, the problem is that we have lost the sensibility for the sacredness of matter, which doesn't want to be used as a mean, as an object. [...] Matter is not an object – they are not 'resources'. One will say: "But look, matter doesn't feel..." NO: When this symbiosis, this sacredness is broken, then we are where we are.¹

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1 Raimon Panikkar, 2001. Extract from the documentary: "Il filo d'oro: Raimon Panikkar, l'arte di vivere", by Werner Weick, 2001, min. 25-27





QUESTIONS TO THE YAMUNA RIVER

BY ANDREA CARETTO AND RAFFAELLA SPAGNA

Andrea Caretto / Raffaella Spagna
9 drawings from the series

Questions to the Yamuna river, 2012
natural pigments, linen oil, orange essential oil, cotton paper

The series of 42 drawings *Questions to the Yamuna River* is the result of a performance that took place on the banks of the Yamuna river in New Delhi (India), near the Old Iron Bridge, on April the 8th of 2012. It was made within the artist residency program organized by Khoj – International Artists Associations based in New Delhi.

The residency program was entitled “In Context – Public.Art.Ecology – Food Edition I”. Artists were invited to engage with the theme of food, a particularly relevant issue in a nation like India and in a city like New Delhi, featuring extreme life conditions and rich contrasts.

Our choice was to consider food as a flow of biomass entering the city – one of the biggest Asian metropolises – focusing our attention on the different phases of this cycle of organic matter, in their relationship with the inhabitants of Delhi: the production in the farming fields, the sale in the market places, the bodies of the consumers (both human and nonhuman)

living in the complex urban ecosystem of city, all the way to its digestion and its return to the environment.

The residency began with the exploration of some key locations, the crucial joints of the flow of matter in transformation: farmers’ fields in suburban landscapes, small street vendors, food stores and big wholesale markets, as well as animal farms in public parks, and public sites for the storage and processing of animal feces, for multiple uses.

While exploring the city and searching for the sites of urban agriculture, we stumbled upon the shocking vision of the Yamuna River, a vast watercourse that is currently one of the most polluted rivers in India, and in the stretch crossing New Delhi, one of the most polluted in the world. A community of urban farmers lives on its banks, owing its survival to the overflows that periodically fertilize the soil. Yet, given the extreme levels of water pollution, the floods contaminate the very same fields they fertilize, as well as all the farming products. Concurrently, the Yamuna is worshipped by the Hindu population as a sacred river, for many people even more sacred than the Gange. Its waters receive almost all the sewage wastes of the Indian metropolis, as well as the remains of the people who are cremated, including their personal belongings.

This incredibly complex and contradictory situation has pushed us to confront the river directly, asking him some questions and elaborating a dialogue-interview made of 42 queries,

with the participation of the Indian artists Pratik Sagar and Pratush La, the Spanish artist Alfonso Borragán and some young inhabitants of the riverbanks.

We made use of a divination practice that interprets the form of color droplets that are released on the surface of the water. Hydromancy comprises a variety of divination techniques. Traces of them have been found in Italy, Greece and Asia Minor. The medium that we used is a mixture of natural pigments (New Delhi soil, charcoal, blue pigment used for laundry), grinded and mixed with linen oil and orange essential oil.

The process consisted of a first phase in which the question was raised to the river, followed by the release of some color drops on the water surface. The form of the floating color particles was then captured, after a few seconds, by laying a sheet of paper on the liquid surface, fixing in this way the drawing shaped by the water flow. When dried, the fiber of the paper sheet ripples, preserving in its waves the memory of the contact with the river.

The 42 drawings constitute the answers of the Yamuna River to the questions that we asked. Their interpretation is left to the imagination and intuition of the observer, who is prompted to ponder on both the questions and the answers, while looking for the meaning of the drawing.

Over the years, we have been using a

variety of divination practices originating shapes that can be interpreted, as a way to explore the issue of form. These kinds of ritual acts, historically widespread, investigate the possibility that all forms actually carry meaning and information. As expressions of specific force fields, they are never accidental or neutral.

Questions to the Yamuna River gather the traces of a conversation among beings belonging to different 'species'; it is an attempt to relate directly with other forms of intelligence, by practicing a capacity to listen to the "other".

This work is part of a larger cycle of experiences of knowledge and bond making with a number of watercourses, in different parts of the world (*Ceromancy: 7 questions to the Rhone river*, Francia, 2011; *The Ischiator Conversation*, Rio Ischiator, Vinadio, Italia, 2017).

42 QUESTIONS TO THE YAMUNA RIVER

NEW DELHI, 8TH APRIL 2012

- 1) Why all this?
- 2) How do You integrate Your present conditions with Your life experience?
- 3) How is it possible to relate with You nowadays? How shall we do it?
- 4) What kind of living beings do You host?
- 5) Why do people use Your banks as toilet and Your beach for bathing at the same time?
- 6) Why are You so beautiful “in black”?
- 7) (The question has been lost)
- 8) How much time will it take for You the river, to regain Your “pure” state?
- 9) How do You deal with the dispersion of ashes and the human souls?
- 10) Does Your being holy work for Your best? Do You feel confused, being this filthy and holy at the same time?
- 11) Where are the great water spirits that live hidden in You?
- 12) What is the most important thing for You? What is Your most pressing need?
- 13) What do You miss the most?
13) What is the most disturbing thing for You, among all the substances that are dissolved in Your waters?
- 14) What is the most disturbing thing for You, among all that floats over the surface of your water?
- 15) How do You feel when You receive these few fresh flowers into Your waters?
- 16) How do You communicate?
- 17) Do You like that Your water is used for irrigation? Is it for revenge that You flood with garbage the fields around You?
- 18) What kind of gas is generated in Your waters?
- 19) How would You change the attitude of people towards You? What first step would You suggest?
- 20) How do You feel when Your waters are pumped?
- 21) How do You keep in touch with Your source in the Himalayas?
- 22) What information do You send to the ocean?
- 23) How does Your body change during the monsoons?

24) When someone drinks Your water, how do You perceive that person?

25) Do You communicate any information to the people who drink Your water?

26) How do You affect the body of those who bath in Your water?

27) All the remains of the crematorium are thrown into Your waters. How do You feel about this human choice?

28) Do You think Your water should be available for drinking?

29) Do You feel sick? Do You perceive the people around You as sick?

30) Which of the states that You cross along Your course do You love the most?

31) What is Your relation with the Ganges?

32) What is it happening in the deepest recess of You, at the bottom of the river?

33) How have You changed the shape of Your course over time? What were the main reasons for this change?

34) What do You communicate to the air above and around You?

35) What is Your contribution to the formation of the Ganges delta?

36) How do You relate to dragonflies?

37) Do You think it is necessary or unavoidable that objects are thrown into Your water?

38) What is Your mission for India, for the Indian people?

39) They say that all the sewage of New Delhi is poured into Your waters. Is this sacrifice Your current mission? Do You do it for the sake of all beings?

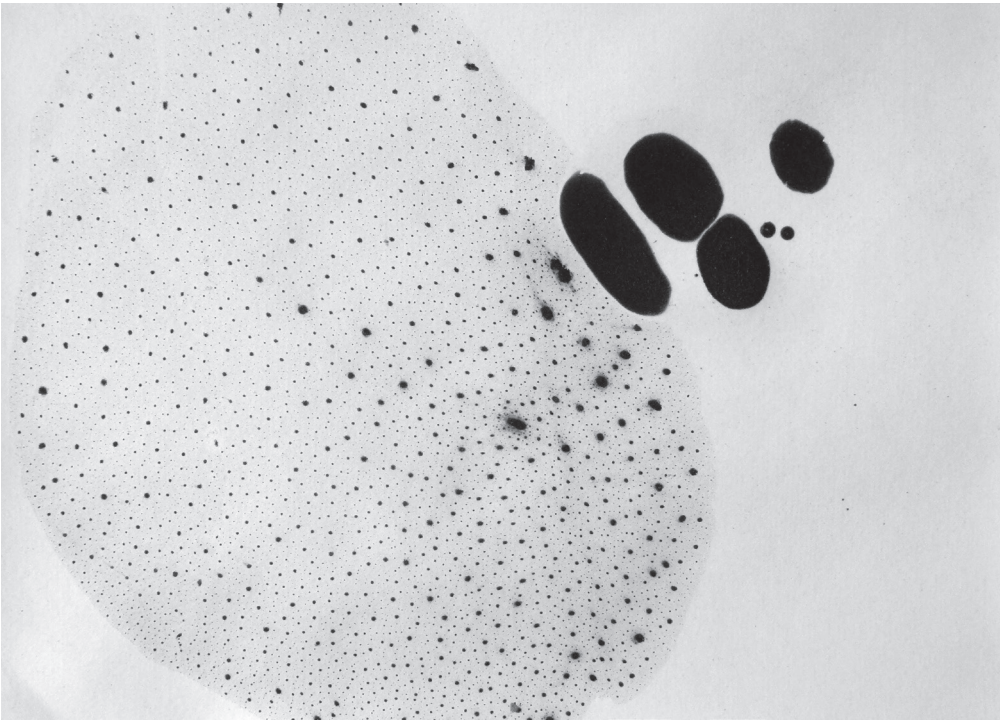
40) Is it true that You carry more water from sewage than from Your source and tributaries?

41) What do You think about the financial speculations that were done in the states before New Delhi, limiting the supply of water reaching You for political wish and fulfillment?

42) How can people realize they are hurting You, by throwing waste of all kinds into Your waters?

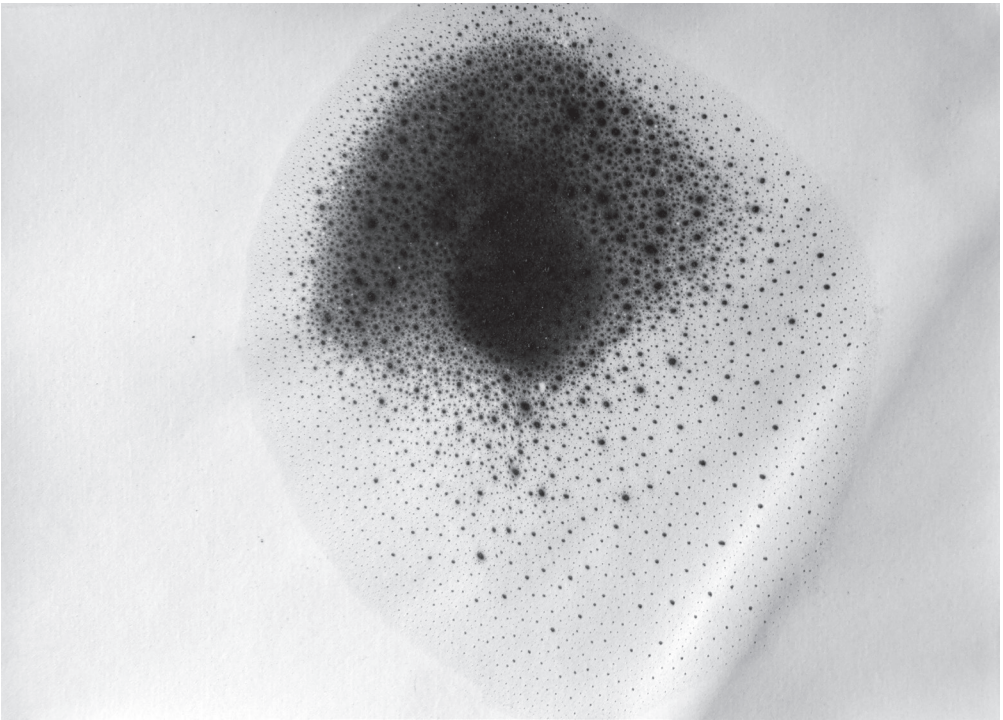
Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 9 : How do You deal with the dispersion of ashes and the human souls?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



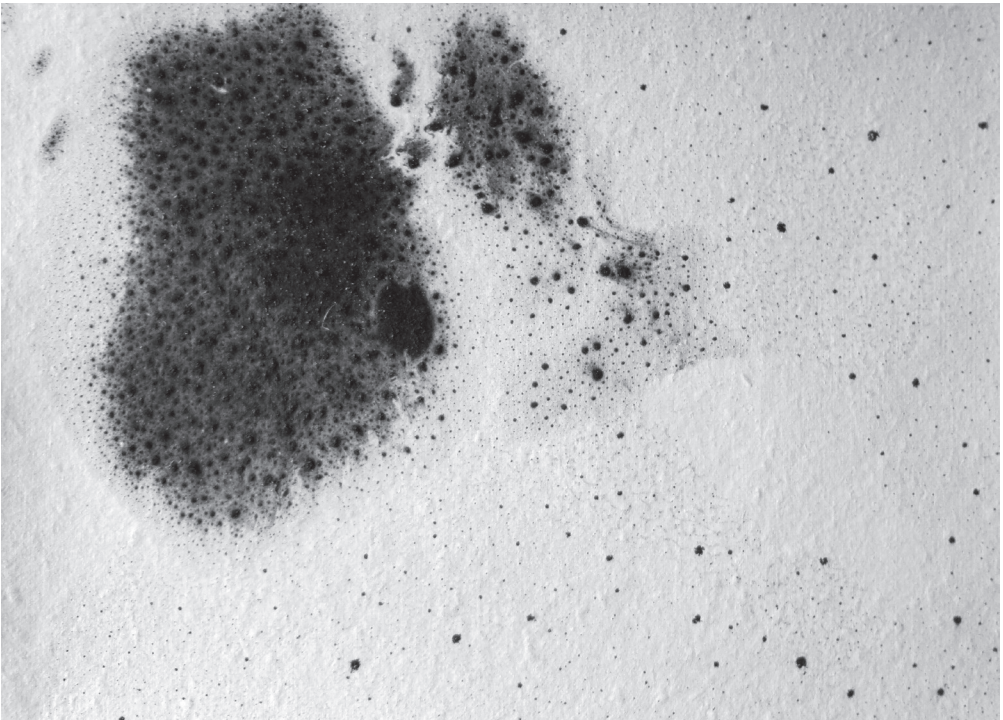
Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 10 : Does Your being holy work for Your best? Do You feel confused, being this filthy and holy at the same time?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



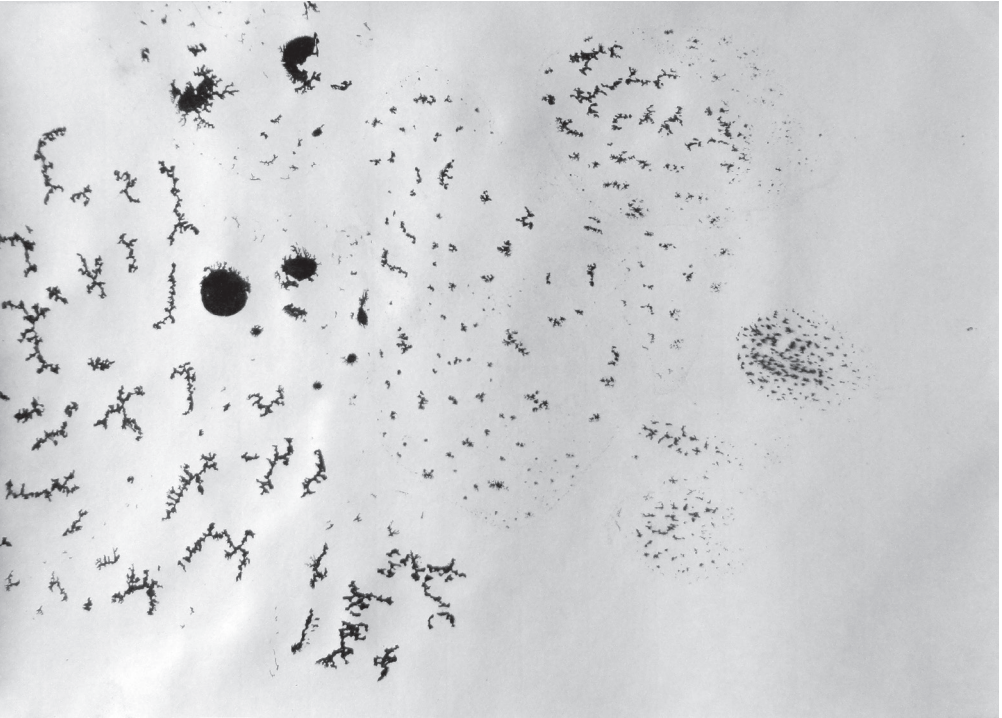
Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 11 : Where are the great water spirits that live hidden in You?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



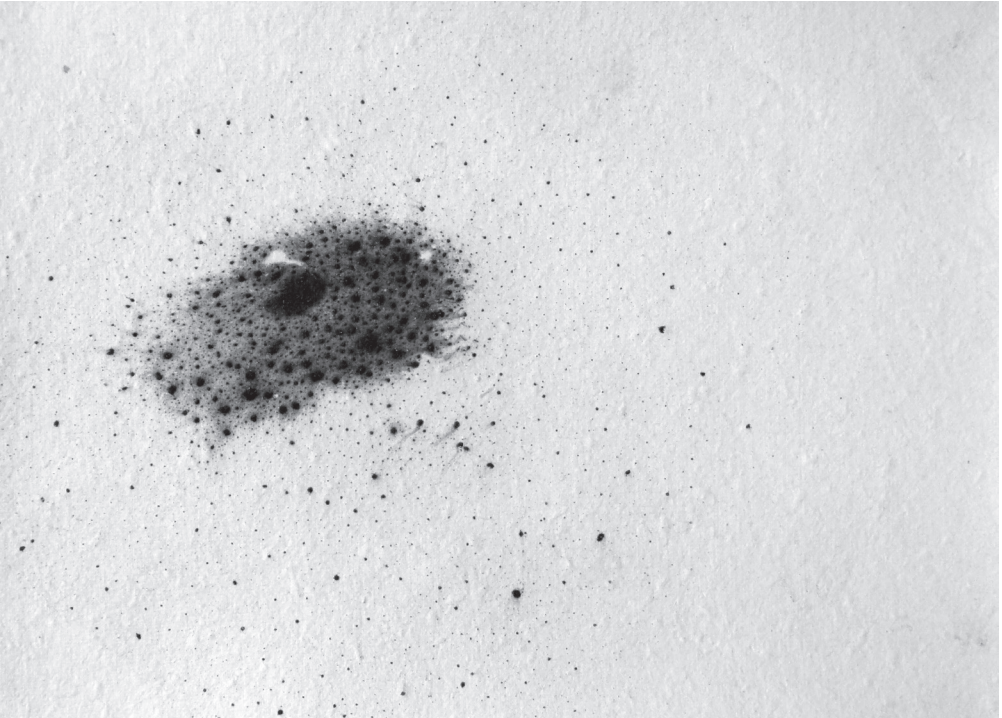
Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 16 : How do You communicate?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm..



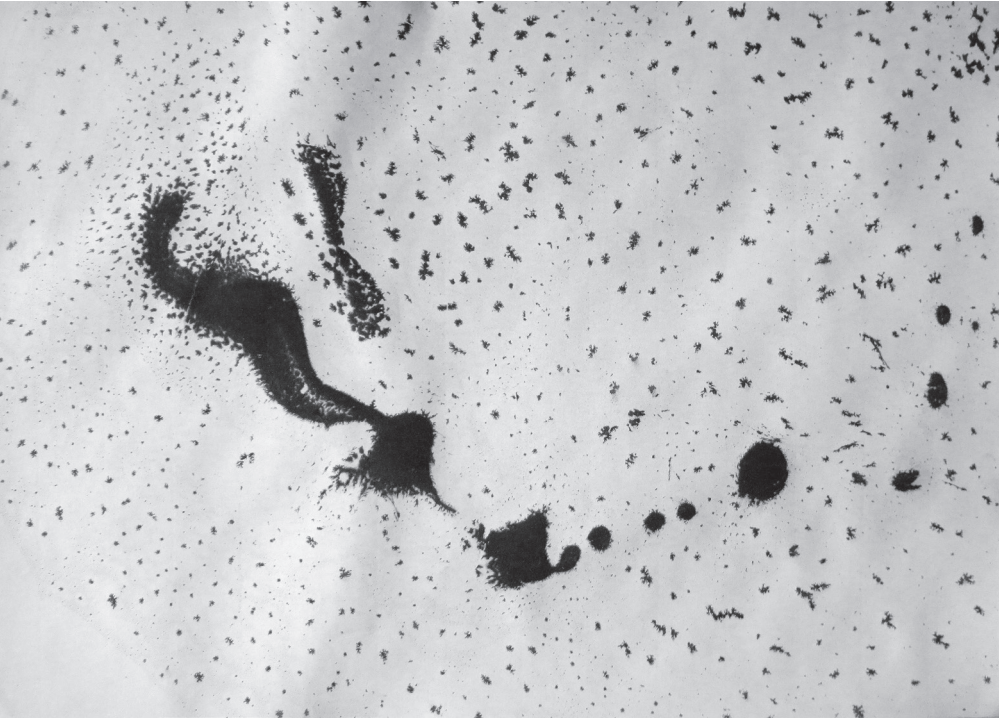
Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 17 : Do You like that Your water is used for irrigation? Is it for revenge that You flood with garbage the fields around You?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 23 : How does Your body change during the monsoons?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 28 : Do You think Your water should be available for drinking?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



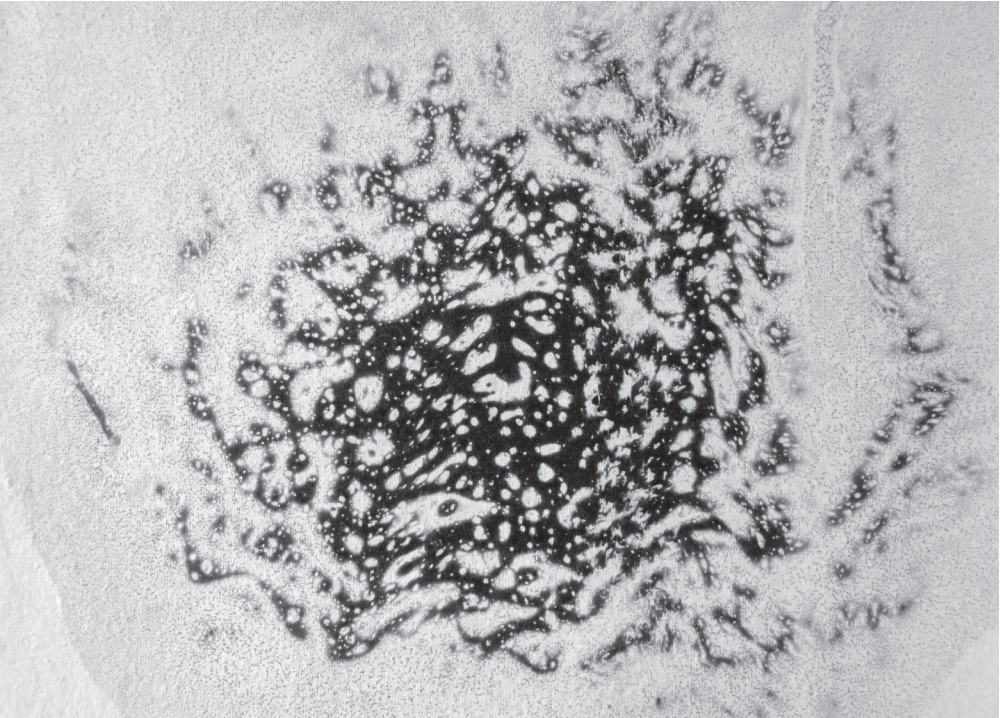
Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 32 : What is it happening in the deepest recess of You, at the bottom of the river?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



Drawing from the series *Questions to the Yamuna river*, 2012 - answer to the question n. 36 :How do You relate to dragonflies?

Mixture of orange essential oil, linen oil, natural pigment on cotton paper; unique piece, dimension 32 x 45 cm.



QUESTIONS FROM THE YAMUNA RIVER

PUT INTO WORDS BY TIM INGOLD

You have asked me many questions. I want to ask some questions in return. But I have a different way of asking them. When you ask questions of me, you treat me as though I were another person. Not just any person, mind you. I'm a goddess, you say, the daughter of the sun. I can work miracles, cleanse you of sin, give you everlasting life. But still, you speak to me as you would to others of your kind, in words. But I don't do words. When you speak, I hear only the echo of your voices, for your language is as mysterious to me as the pattern of my waters is mysterious to you. What, I wonder, are you trying to tell me?

The way we rivers ask questions is by testing with our waters. We send out rivulets to investigate every inch of our embankments. We feel the mud and stone over which we flow. We get to know the land beyond the banks by flooding it every year, when we're swollen by monsoon rains. We examine the bodies that come to bathe in us, and study all the floating and swimming things we carry along. We're curious to know where they're from and what they're made of. And when a rivulet trickles down your throat, it asks: what kind of being are you? What creatures do you host? Did you know that every time you stop by to take a drink, we are actually interrogating you?

If we only knew what you are trying to tell us! We don't understand. Is it about death? We knew nothing of death before

you came along. All we knew was life, ever-replenished from mountain springs. And we would eagerly bring this life to you, irrigating your fields and slaking your thirst. But your life doesn't flow like ours. On the contrary, in order to live you have to capture the flow, to hold it up, to congeal it into solid things like bodies, foods and artefacts. For you to live, it seems, we must die. And vice versa, when you die you leave what remains of your existence – your cremated bodies and your used-up things – to us. To you, we are rivers not of life but of death.

And now there are so many of you! Your life has exploded, but for us the stench of death is everywhere. It is as though our bodies were bled dry by a swarm of leeches sucking on every pore. But the stench we feel is not the one that fills your nostrils. You complain about the rubbish and the sewage. You say we're polluted, yet you still take our waters for your fields and to drink. But we are not bothered when you return the effluent of your lives to us. After all, it augments the flow and nurtures growth. But if our waters cease to flow, if they stagnate, then we will die. Our greatest fear is not pollution but stagnation – when the flow is reduced to a trickle.

What have you done to us? Why have you built all these barrages, pumping stations, and canals? Is it not enough that we bring the waters of life to you, that you have forcibly to take them from us? And why, when you grudgingly return your effluent, do you do so not as a gift but as a discard, hoping thereby to wash your hands of it?

We're puzzled by the contradiction. On the one hand, you venerate us, you want to mingle your bodies with our waters, and eventually to escape the torment of death by dissolving into them. Yet on the other hand, your engineers want to treat us as part of the plumbing, integrated into an infrastructure of pipes, taps, sinks and drains.

Are you, perhaps, trying to talk to us about purity? Until you taught us about death, we never gave any thought to purity. The idea would have meant nothing to us. For your purification is our mixture. Our waters have always been fecund because, in them, everything is mixed up. It makes no difference to us whether you drink them, bathe in them, or defecate in them. That's what other animals do, and it does them no harm. Life's all in the flow, we say! But recently you have changed your tune. For now, instead of asking us to purify you, it is you who insist on purifying us. You poison the life that's in us, and put us in bottles of moulded plastic. 'Drink this', you say.

There's a world of difference, however, between drinking from a bottle and taking our waters into your mouths. To drink directly from us is an act of prayer or supplication, a gracious receipt of the gift of life. But bottled water is not just purified; it is contained. In the bottle, you have made of water a commodity. Having bought it, it is yours to consume. When you drink, we are no longer there to question you, nor do you think of us. The bond of curiosity and care that once united us is broken. What happens, then, when you

return to us to be purified? You get sick! Your bodies, unaccustomed to mixture, are overwhelmed by our vitality. They desire only to run with us.

What has broken the bond that once made it possible for us to carry on our lives together? Why have you turned your back on us? For thousands of years, in the rains, we would flood the land, covering it with waterborne silt that fertilised your fields and brought you abundant crops. But now you treat the flood as a disaster. It engulfs roads and buildings, bringing ordinary life to a stop. Your engineers, having built their barrages, canals and pumps, are put to work again, this time to erect ever higher flood defences. Human society, they maintain, can only be founded on dry land. The job of the river, in their view, is not to bring water to the land but to drain it away.

But as long as you turn your backs, we'll never be able to live together again. Remember that we were already running long before any of you arrived, and may still be running long after you are gone. We've made it possible for you to live and farm, and to build. Yet now you would drive us out like vermin. Why pump us dry and clog us so we can no longer flow? We don't mind wastes that dissolve; we've always carried these, whatever their origin. But now you're filling us with stuff that doesn't dissolve at all, but clumps into a suffocating mass. We've seen nothing like it before. And much of it is made up of the same bottles in which we had earlier been incarcerated.

Perhaps it is all a question of time. For us, time future lies downstream, where

the eternal ocean awaits us. We follow the waters that have gone before, and will be followed, in turn, by those coming after. But when you turn your backs on us, you also turn your backs on our time. To face the future, for you, means looking upstream, whilst our future looks to you like a discarded past. Your overriding concern is to stake a claim to the present by holding up or diverting the flow coming towards you, so that you can catch and congeal it, even bottle it, into things. The result is a pile-up. And as one pile-up gives way to another, you say, time passes and history is made.

I, Yamuna, hereby implore you to turn around again. Be like us, and follow your forerunners into the future, rather than casting them into the past. Think of time as we do, as running from the mountains to the sea. Allow us to spread upon the land, instead of putting up barriers to keep us out, or confining us to canals and pipes. Understand that our business is not to drain the land but to enrich it. By all means bathe in us, but stop poisoning us with your chemicals and putting us in bottles. Learn to welcome our wetness into your hearts, and to build on saturated ground. Live with us, and when you die, we'll bear your ashes. Care for us, and we'll care for you!



CULTIVATING LIFE: REGENERATIVE PRACTICES IN THE VALENCIAN *HORTA*

**A CONVERSATION BETWEEN XAVIER
LUJÁN AND CHIARA SGARAMELLA**

C.S. Thank you for your time Xavier. I would like to share with you some reflections on our relationship with soil and its inhabitants, based on your research and practice. In 2010, you started an agroecological project named Vorasenda in what is known as Horta Nord, in Valencia, Spain. The Horta landscape is a periurban agricultural area created through to an eight-century old irrigation system adopted since the Islamic period that made it possible to grow fruits and vegetables in this dry region. This distinctive network of ditches and canals is built in such a way as to allow water to circulate only by gravity and is collectively managed by irrigation communities that share access to this common resource. Despite being recognized as world agricultural heritage, this complex agrosystem is constantly threatened by urban development and infrastructure. The change in land use could cause the irreversible loss of fertile soil as well as the destruction of an invaluable ecocultural heritage. By adopting a community-supported agriculture approach, your project Vorasenda aims to protect this productive land by establishing a direct relation between citizens and farmers, as well as

promoting agroecological production in the Horta ecosystem.

My first question revolves around the creation of an agroecological farm in a context dominated by industrial farming, and the knowledge needed to begin such a process. You studied environmental engineering at university. The agroecological approach questions the epistemological bases of modern science, promoting a non hierarchical pluralism between knowledges and practices, focusing on relationships and emergent properties. In this regard, I would like to ask: how helpful was academic and technoscientific knowledge in the implementation of agroecological cultivation methods in your fields? Did you have to deconstruct or unlearn some of the assumptions, notions and practices that you had assimilated earlier in your life?

X.L. First of all, though agroecology criticizes certain aspects of conventional science, I believe scientific research is important and necessary in this field. However, in industrial agriculture, scientific evidence is often used as a discourse to implement practices that lead to the plunder of resources and the accumulation of privilege. Certain scientific findings and aspects of the scientific method are emphasized while others are ignored in order to justify these policies. From my point of view, in recent decades, science has often been applied

in the agricultural sector under biased premises in order to maintain specific power relations¹.

As for my university education, an interesting thing has happened to me lately and I think it is relevant in relation to your question. While reading and experimenting with agroecology and soil science, I have been recovering some of the theoretical notions I studied at university. When I came into contact with these concepts in the early 2000s, I internalized them but in a totally decontextualized way. At university I felt we were exposed to these ideas but they were far removed from our experience. As I was saying, I am now in the process of rediscovering everything I had learned, in relation for example to ecological successions in altered ecosystems. Not only plant successions, which are very well known, but also the microbial ones that are relatively less explored. Now, after almost two decades, I am coming to terms with what I studied back then. However, this happened after my human and professional experience developed in ways totally detached from academia. Rather than unlearning, then, I have had to disengage from the academic setting and develop my own thinking framework in close relation to the land and the development of an agroecological project.

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1 For a reflection on agro-ecosystems as socio-ecological constructs and products of power relationships, see González de Molina, M. (2012), Algunas notas sobre agroecología y política. *Agroecología*, 6, 9-21. <https://digitum.um.es/digitum/handle/10201/29877>

Your words resonate with Arturo Escobar's reflection on the need to move beyond the detached and objectifying perspective of academia and incorporate knowledge emerging from the relation to the phenomenal world – and the struggles to protect the land and the life in it². Talking about knowledge and practice, agriculture has been in your family for several generations. Were you able to draw on your family's knowledge or on neighboring farmers' traditional practices in the creation of your project?

Naturally, we learned all about irrigation or how to till the land from other local farmers but, having chosen an agroecological approach, we found out that very few of the practices used in the conventional model were useful for our work. This is not a judgment against those involved in industrial agriculture. I think it is important to underline that farming is not easy, even in the conventional sphere. We should not underestimate the efforts of farmers who try their best to keep the countryside and their families' economy alive, even within a line of production that is quite aggressive towards the territory and the ecosystem at large. That said,

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2 Escobar, A. (2016). Thinking-feeling with the Earth: Territorial Struggles and the Ontological Dimension of the Epistemologies of the South. *AIBR Revista de Antropología Iberoamericana*, 11(1), 12-32. <https://doi.org/10.11156/aibr.110102e>

our production formula is completely different from the conventional one. In fact, community-supported agriculture proposes very specific modes of production and distribution and is based on a very close relationship with the citizens-consumers. Therefore, the most common farming practices and even the traditional ones belonging to the Valencian *Horta* do not fit with our values and objectives. At the beginning, we imitated some of the practices implemented by the local farmers, but very soon we realized that they generated a continuous dependence on agricultural inputs, on the farm machinery. In industrial agriculture farmers do not cultivate life. They are constantly depending on external resources in order to grow the crops. That is why we had to try new production methods in line with our agroecological principles. There was no one around to draw inspiration from. Thus, the majority of the practices we apply in Vorasenda are born from our own experimentations. This opened up enormous learning possibilities for us, but we also made a lot of mistakes because locally we had no reference points.

Could you describe some of these experimentations, as you call them? What practices have you carried out in order to restore and keep the soil alive?

In our geographical context, a farmer or group of farmers wanting to experiment with a regenerative approach – inspired

by agroecology, permaculture, biodynamic agriculture, agroforestry etc. – usually inherits a heavily degraded soil as a result of decades of intensive conventional farming. The recipe for revitalizing the soil comes from studying models such as the forest in order to understand how nature spontaneously produces millions of interdependent relationships, generating relatively stable systems with an overflowing and vibrant aliveness and regenerative capacity³. It is moving to see the many intricate layers of life that can coexist in a square meter of forest, all of which are sustained by a rich and complex soil. On the contrary, what we normally have to work with are fields whose soil has no structure and shows a lack of minerals and microbial life. In such an environment plants can hardly thrive because, for example, the minerals they need for their metabolism are not available to them.

Going back to your question, the first action that I believe needs to be done in order to revitalize a soil is consolidating a body of citizens-consumers committed to agroecology because that is the *human humus* that will truly revitalize the land. Starting an agroecological project requires time, work and economic resources. It is a fallacy to think that farmers can carry out the soil regeneration autonomously: they need a community around them. Moreover, when we talk about degraded soils, it is important to understand that

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³ Holmgren, D. (2002). *Permaculture: Principles & Pathways Beyond Sustainability*. Permanent Publications.

this degradation is the result of a cultural hegemony, a social process that has led to this destructive outcome and that needs to be reversed.

I find the notion of *human humus* very compelling. It connects with the idea of a *common aliveness* proposed by María Puig de la Bellacas⁴ as a nurturing element for a more caring human-soil relationship.

Yes, I believe this common responsibility to nurture the soil and sustain agroecological practices needs to be present throughout the regenerative process. It is a process that also regenerates us and our social bonds. In my opinion, the agronomic techniques and practices are a natural result of this commitment. We start with the application of rock flours for the remineralization of the land. Then comes the incorporation of biofertilizers to replenish the soil microbiota, in order for the soil's aerial expression – meaning the plants and the microecosystems they sustain – to be balanced, biodiverse and healthy. Obviously, the health of the soil is reflected by its aerial expression. For example, we can throw a cabbage seed into a desertified field and the plant will grow if we add some agricultural inputs. However, it will most probably be a vulnerable plant since it is the expression of a life depleted

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4 Puig de la Bellacasa, M. (2019). Re-animating soils: Transforming human–soil affections through science, culture and community. *Sociological Review*, 67(2), 391-407. <https://doi.org/10.1177/0038026119830601>

soil. Therefore, it will not be able to sustain itself with its own metabolism and immune system. Another option is that, being in a desertified system, the cabbage will be heavily attacked by snails because there are no birds, hedgehogs or other predators to control the snail population. There are different scales of degradation, not only in the ground but also in the ecosystem at large. Agroecology tries to reverse some of these unbalances. Going back to the soil, like plants, humans too depend upon microbial life, and there is a connection between our inner microbiome and the one in the soil, as many recent studies show. Soils are a *complex microbial phenomenon*, just as humanity is, as Lynn Margulis and Dorion Sagan put it⁵.

True. This realization contributes to erode our anthropocentric understanding of life by showing the different interdependencies and forms of *interspecies care*⁶ our existence rests on. Can you share some of the learning experiences you have had in the past years through your experimental agroecological practices?

Definitely. For me it was crucial to understand that forests are a great library for us to discover all the processes and relationships that sustain biodiversity. If

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5 Margulis, L., & Sagan, D. (1997). *Microcosmos. Four Billion Years of Microbial Evolution*. University of California Press.

6 Puig de la Bellacasa, M. (2017). *Matters of Care. Speculative Ethics in More Than Human Worlds*. University of Minnesota Press.

you take the forest as a model, you learn to read what is going on in your plots and what processes need to be strengthened to create a more balanced agrosystem. However, this is often not the case in conventional agriculture, where a constant cycle of depletion and desertification is repeated. In industrial farming we are taught to remove elements instead of replenishing the food web. It is therefore essential to understand the mechanisms that sustain biodiversity and then try to reproduce some of them in the fields. After understanding how a soil builds itself, for example, I made peace with the so-called pioneer "weeds" and I have even begun to revere them. It is something very meaningful to me. Through this new lens, I have finally understood their function, their specific role and how, once they have fulfilled their purpose, they naturally disappear leaving room to other plants starting a new succession stage. These weeds we are so used to view as harmful to our crops are actually the first phase between a desertified field and a more complex and stable system. This insight was truly liberating. As many other farmers, in fact, I was caught in a constant struggle against pioneer "weeds", a senseless losing battle.

You mentioned the ability to read what is happening in your plot of land as one of the fundamental skills to be able to conceive and apply methods to restore and strengthen life in the soil. How do you listen to the non-human

"other" in your fields, meaning the plants, microbes, fungi and millions of other beings that inhabit the soil? What signs indicate that the practices you have implemented are contributing to enliven the soil and which ones inform you that something needs to be improved or modified?

Quite simply health manifests itself. You see that the bodies of the plants are healthy and not dependent on external inputs. Even though I have been working with these kind of methods for a relatively short time, I can tell you that health clearly expresses itself through the different life cycles happening in the fields. The problem is that we are often numb, detached and unable to interpret these signs. Unfortunately, I also believe that in many cases we have almost never come across a truly healthy ecosystem in our lifetime. Even when we go to a primary forest we don't necessarily know how to read it from an ecological point of view. However, humanity could not have survived without having established a dialogue with its own habitat – its creatures and processes. In our culture, we need to rebuild that type of communication and exchange. Listening in that sense is essential. It is necessary to open the many perceptive channels we have systematically closed or ignored, in order to fully see the state of the ecosystem and transform the processes that are deteriorating the material bases that sustain life.

It is interesting to see that your experience relates with what Margulis and Sagan define as *aesthetic perceptions of health*, which rely on empathic attention, mindful observation of life processes and consideration of organisms and systems' autopoiesis, meaning their capacity to sustain themselves and reproduce. In relation to this predisposition to listen and pay attention, how can we cultivate empathy towards beings and processes that are often invisible and very different from humans in scale and characteristics? Can art practice play a significant role in this effort to reestablish a meaningful dialogue?

I am not sure I have the answer to this question. I think we need to create proximity with the soil and experience it directly. Working with sensorial perceptions through art can surely be a significant strategy. Perhaps we also need to reframe our field of action and attention. I feel we are often focusing on fixing a broken system. In my opinion, there is an anthropocentric drive for control and manipulation in this idea. I believe this drive can originate from a lack of trust in what it means to be alive and in what life generously provides. My experience has taught me that it is important to trust a living system and learn how to take care of it by paying attention to the feedback it provides us. This comes as a result of a continuous dialogue and exchange. It became evident to me in the work we did

in one of the fields we recently acquired, which was turned into a food forest. By simply inoculating the soil with micro-organisms and covering it properly, we saw a piece of land totally drained by industrial agriculture transform and boom with life in just two years. If you dig a little hole in this field, you can now see an impressive amount of hyphae, insects, earthworms, etc. that were not there before. And you ask yourself: who brought them here? No one did. We simply created some of the conditions for life to flourish. Sometimes we think of soil as a bare, inanimate substrate but there are seeds, dormant spores and other beings in it that have the potential to build a forest if we let them. With minimal human effort and time, the agro-ecosystem starts to recover and self-regulate. Thus, it is very important to step away from our anthropocentric urge for control and intervention which derives from the industrial farming mentality portraying the soil as a lacking space where it is always imperative to bring in inputs from outside. I believe it is important to let ourselves be surprised by its richness, generosity and self-restorative potential, and to integrate that knowledge and experience in order to fine-tune our practice and intuition.

In that respect, the words of anthropologist Kristina Lyons are especially significant. Through her work on farmers' cosmovisions and practices in Latin America, she concludes that "transformative potentiality is

not a human privilege, but always a relational matter dispersed in the connections and labor among people as well as other beings and things”⁷. As for the transformation of our relationship with soil, I think artistic research can play a relevant role in linking human and more-than-human worlds, thanks to the potential of art practice to integrate different types of knowledge, explore the embodied and sensory dimensions of knowledge, while destabilizing conventional views and perceptions. As an artist and researcher, I have proposed, together with fellow artist Estela López de Frutos, the creation of *Agroversitat*⁸, a platform to engage in intergenerational artistic and pedagogic processes related to land use and agroecology in the *Horta* landscape. Arising from a long-term collaboration with Vorasenda and other agents active in the Valencia area, this initiative started in 2022 with the aim of grounding artistic practice in the local context and bringing it closer to ecological systems and processes that sustain our life. Also, the project proposes a collaborative, place-based and experiential learning approach focusing on the notion of care for human and ecosystemic relations, starting

from the premise that our sensitivity can be transformed by the encounter with the non-human “other”⁹. What motivates your involvement in art based research and cultural activities such as *Agroversitat*?

Since the very beginning, our project has had, besides the production of organic food, a line of action related to culture and social agency. We also offer educational services to schools and other collectives. We support *Agroversitat* as a space where we can practice decentering our perspective. In fact, most cultural and educational initiatives come from and revolve around the city, while your project immerses cultural production and collective learning processes in an environment that is more connected to natural cycles. Placing an open “university” in our fields allows us to engage with more horizontal forms of sharing knowledge and to nourish our predisposition to keep learning and experimenting.

Thank you Xavier for this inspiring conversation. Our hope is that this collaborative platform can become over time a gathering place for people and knowledge in connection with human and more-than-human communities and needs, as well as a space for shared imagination on our common future(s).

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7 Lyons, K. M. (2020). *Vital Decomposition*. Soil Practitioners and Life Politics. Duke University Press.

8 For details, see: <https://www.consortium-seus.gva.es/actividades/agroversitat-laboratorio-de-arte-agroecologia-y-pedagogias-criticas/?lang=es>

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9 Tsing, A. (2015). *The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins*. Princeton University Press.



**ANIMAL BEING: EXTRACTS
FROM THE PIANPICOLLO DIARY
BY ALICE BENEZIA**

Pianpicollo Selvatico is an ancient place-name for a land that welcomes a farmstead surrounded by woodlands and pastures, in an isolated valley in southern Piedmont. It is a home to a rich community of living and non-living beings.

Patient and generous, over the past few years it has also been home to me, and along with me a small group of creatures, traditionally thought of as farm animals. As of today, two donkeys and three horses, two pigs, four hens and a rooster. They came here as a gift, sometimes in distress, through various encounters and often difficult circumstances. Some already old, some just born, some in the prime of their lives. They are species that have been domesticated for millennia and selected in more recent times with increasing, brutal precision, to fulfill specific functions. Programmed in their behavior and genetic expression.

In Pianpicollo they no longer have a functional life; they are not eaten or put to work. They are free to move around the valley during the day and return, at different times, to shelters of various shapes and sizes where they take refuge for the night.

I am conducting with them an experiment

of mutual care and transformation.

I tend to observe them, to pay attention, to be with them without any particular purpose, other than the daily feeding and cleaning rituals. I feel their presence – and mine – as life in a form.

Sometime we cross each other during the day, while busy in our own affairs, as one would meet a friend on the road. We improvise the rhythm of the days, according to weather, season, dangers and opportunities. We make dates and we show up on time, unless serious impediments occur.

When the dark comes, I take notes on the events of the day.

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Extracts from the Pianpicollo diary¹

2021

5 November

In the afternoon, as the sun begins to wane, I set out to look for the horses. They graze freely and usually stop at the edge of the large meadow, within sight of their home – and mine. I do not see them. I keep walking for a while and find them beyond the ridge that opens onto a

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¹ This part of the text is an extract from: Alice Benesia 2022, "Inhabiting the wild" in: Claudia Losi 2022. *Being There. Oltre il giardino*, edited by Leonardo Regano, VIAINDUSTRIAE publishing, pp. 26-31. Translated by Bennett Bezalgette-Staples

green amphitheatre. It is the first time I have seen them eating peacefully beyond the edge of the meadow. I remember the numerous attempts to get them used to grazing there with a wire fence over the years. Anxious at not seeing the house, as soon as I moved away they would break the wire and gallop back to the little garden in front my kitchen door. From there they would calmly wander off again towards more open spaces, but always within eyeshot. After a few attempts, I suspended the experiments to keep them beyond the ridge, asking the large meadow for a greater effort to bear their grazing over time.

After a lifetime of confinement and instructions, moved from stalls to paddocks, amid stables, trailers, competitions and parades, my horses are slowly gaining a taste for freedom. In a fleeting moment of contentment, I call them and take them back to the stable for the night.

10 November

This morning, Luigi calls me to tell me that my horses are in his meadow. He breeds cows and owns a lot of land. I apologise but he tells me it's fine. That pasture will be re-sown in the spring and the horses can stay there as long as they want. I go visit them anyway; I find them a twenty-minute walk from home, peacefully grazing in the sun, in a wonderful place. I leave them there and return at dusk. They have not moved. Facing southwest, the

meadow is particularly welcoming, warm and still covered in a rich variety of plants.

We go back home together, on a long walk. I notice a sense of fullness in me, the feeling of being able to occupy a slightly larger inner space. Once in the barn, I watch them quickly doze off.

21 November

Luigi's meadow is blessing us with a beautiful autumn. Every day I let the horses loose near the barn; I meet them at sunset in that pasture, and walk back home together. I notice a correspondence between their range, the outer space they feel confident to explore and occupy, and the inner space I grant to my animal being. Both are expanding.

22 December

Just before sunset, I walk out to look for the pigs. At lunchtime, I had seen one far away, a tiny, round, grey shape at the end of Franco's field, on the edge of a chestnut forest. I set off in that direction, but once there, I see no one.

I follow a winding path, around the edge of the forest and see an inner track that leads back home. At the crossroads I come across Poldo eating acorns beneath an oak tree. He greets me like a party pooper. I stand behind him and encourage him to start off along the little road, towards home. He comes round to the idea that it's time to move, but not in the direction I'm trying to move him in. I insist. So does he. I sense his precise intention and decide to follow it. I stop pushing him with my voice

and movement, changing pace, slowing down, remaining silent as I start to follow him. I quickly realise he is heading home, but simply not along my path. In no time, I find myself in the thick of the forest, clambering uphill along a small, well-trodden track, clearly very familiar to my walking companion, probably inherited from wild boars and shared with them. Small and sturdy, Poldo ploughs through the tangle of brambles and fallen branches with ease. I have to bend down, at times almost crawling. In a turning of the tables, I slowly and clumsily struggle to keep up with him. It turns out to be a shortcut, and a few minutes later we emerge behind the stable. Baldo is already there, waiting for us.

Often have I seen the paths of wild animals intertwine with mine, but never have I had the privilege of a guide. Once again, I experience a sense of expansion.

2022

30 January

Isidora died today, attacked from above by a bird of prey. Over the years she had escaped many attacks. She was agile, bright and friendly. She was Archimedes the cockerel's favourite. I find the remains of her little white body beneath a cherry tree near the house. Scattered feathers lie everywhere. Archimedes is mute and still, in a bush next to her. His gaze is fixed; he can't move away. We remain there together for a while. Death makes a vast silence.

How far into the wild can a creature that has been domesticated for millennia venture?

31 January

This morning I buried Isidora. At dusk, Luigi's meadow is suspended above a sea of fog, dotted with an archipelago of hilltops. The horses follow me home. I realise that my thought was misplaced. The issue is not returning to the Eden of some hypothetical lost wilderness, a topologically impossible trajectory, but moving towards a certain fullness of being, alive here and now. I greet Archimedes, already asleep in the henhouse with Marta and Cloe.

On the doorstep, I am reminded of the words of Elizabeth Costello: "One name for the experience of full being is *joy*."²

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² J.M. Coetzee 1999, "The lives of animals", Princeton University Press.



APPENDIX – IMAGES

1. Dolphin

Frame from “So Long, and Thanks for All the Fish”, Intro song to the movie: “A Hitchhiker’s Guide to the Galaxy” by Garth Jennings (2005), from the novel of the same name by Douglas Adams (1979).

2. Headlights in the dark

Alice Benessia 2022, from the series “Ask again”. Digital color photograph.
30-11-2022 / 7.03 pm / 2°C

3. Tree at night

Alice Benessia 2022, from the series “Ask again”. Digital color photograph.
16-11-2022 / 7:50 pm / 4°C

4. Marten

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera. n.3 Fork.
21-06-2019 / 5:49:51 am / 12 °C

5. Deer

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera n. 3 Fork.
01-07-2019 / 5:50:03 am / 17 °C

6. Wolves

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera n.3 Fork.
18-09-2019 / 2:41:40 am / 13°C

7. Moth

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera n.1 Forest.
2-10-2019 / 00:01:34 am / 12°C

8. Forest at night

Alice Benessia 2022. Digital color photograph.
28-11-2022 / 6:07 pm / 3°C

9. Wild boar

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera n.4 Source.
27-06-2019 / 3:57:31 am / 23 °C

10. Fox

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera n.2 Path.
08-09-2019 / 10:35:50 pm / 7°C

11. Weasel

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera n.2 Path.
20-09-2019 / 1:47:34 am / 11°C

12. Badger

Alice Benessia 2022, from the series “Ask again”. Wildlife infrared camera n.4 Source.
23-06-2019 / 1:34:55 am / 12 °C

13. Intrinsic Mutuality, n. 1

Chiara Sgaramella, 2022. Linocut on paper, 22 x 18cm. Soil viruses and bacteria, decaying leaf and mineral particles.

This work belongs to the series of preliminary prints made for the creation of a tablecloth ‘inhabited’ by soil creatures. This cloth was then used to serve dishes prepared with wild herbs and fruits collectively harvested at Pianpiccolo Selvatice in July 2022. A moment of sharing and commensality based on interspecies care and intrinsic mutuality.

15. Badger

Alice Benessia 2022. Charkoal drawing on paper, 20,5 x 14,5 cm

On a scorching July afternoon, a badger comes out of the woods and approaches two women engaged in a workshop in Pianpiccolo. He circles around them in a frantic run, then he collapses at their feet, hopelessly hot and thirsty. I rush to him, wrap him up in a cold wet cloth and give him some water. With the help of a friend, we take him home in a barrel. We place him in a stone sink outside. I slowly keep pouring water on him. He starts drinking and doesn’t stop. He is young, still growing. I have never touched a badger. I am wearing gloves. I keep looking at his big bear-like paws, his sharp teeth, his bristly wet fur. As soon as he feels better, terrified, he tries to bite me. As the evening falls, we take him back to the woods and we fill with water a big empty puddle on its edge. In the following weeks, keeping that puddle full becomes a ritual. That night I have trouble sleeping. The next day, I distractedly sit for a moment in a drawing session of the workshop. All of the sudden, with no thoughts, my hand starts looking for the badger on the paper.

CONTRIBUTORS BIOS

Alice Benessia has a hybrid background in theoretical physics, philosophy of science and visual arts. In 2017, she founded Pianpiccolo Selvatico, a rural research center, working at the boundary between art, deep ecology and interspecies coexistence. A Foundation since 2022, Pianpiccolo is today her home, place of research and daily practice. In her work, she uses photography, writing and dialogue as vehicles of presence. Since 2017, she curates the annual program Pianpiccolo Research Residency, where artists and other researchers work together at the root of their research, collaborating with the human and nonhuman community of Pianpiccolo. Since 2020, she coordinates the partnership of Pianpiccolo with the Italian National Research Council, within the project BRIDGES, on the ethics of research through the case study of soil vitality.

G. A. Bradshaw is the founder and director of The Kerulos Center for Nonviolence. She holds doctoral degrees in ecology and psychology and was the first scientist to recognize and diagnose Post-traumatic stress disorder in Elephants, Chimpanzees, Orcas, and Animals. Her books include the Pulitzer-nominated *Elephants on the Edge: What Animals Teach Us about Humanity*; *Carnivore Minds: Who These Fearsome Beings Really Are*; *Talking with Bears: Conversations with Charlie Russell*; and *The Elephant Letters*; *The Story of Billy and Kani*. She is the director and primary carer for rescued Domesticated Animals and Native Wildlife at Grace Village (formerly The Tortoise and the Hare Sanctuary) in the mountains of southern Oregon, U.S.A., located on the traditional lands of the Grizzly Bear, Taklema, and Gray Wolf.

Andrea Caretto (Turin, 1970, degree in Natural Sciences) and **Raffaella Spagna** (Rivoli, 1967, degree in Architecture) have been working together since 2002, collaborating with public and private institutions in Italy and abroad. They live and work in Cambiano (To). Their approach is based on an orientation to "presence" and experience in the world, in close contact with matter in all its transformations and individualizations; an exercise of attention and care for things intended as nodes of an interweaving, which trains the ability to perceive the world as consisting of elements in continuous correspondence. They are among the founding members of the artists' association Diogenes of Turin and the Pianpiccolo Selvatico ETS Foundation. They collaborate with the Department of Philosophy and Educational Sciences at the University of Turin.

Monica Gagliano is a Research Associate Professor in evolutionary ecology at Southern Cross University where she directs the Biological Intelligence (BI) Lab as part of the Diverse Intelligences Initiative of

the Templeton World Charity Foundation. She has pioneered the brand-new research field of plant bioacoustics by demonstrating for the first time that plants emit their own 'voices' as well as detect and respond to the sounds surrounding them. She has extended the concept of cognition to plants by demonstrating experimentally that plants can learn just like animals do, re-igniting the discourse on plant subjectivity and ethical standing. The Italian translation of her latest book, *Thus Spoke the Plant* (North Atlantic Books, 2018), has been published in 2022 by Edizioni Nottetempo.

Tim Ingold CBE, FBA, FRSE is Professor Emeritus of Social Anthropology at the University of Aberdeen. He has carried out fieldwork among Saami and Finnish people in Lapland, and has written on environment, technology and social organisation in the circumpolar North, on animals in human society, and on human ecology and evolutionary theory. His more recent work explores environmental perception and skilled practice. Ingold's current interests lie on the interface between anthropology, archaeology, art and architecture. His recent books include *The Perception of the Environment* (2000), *Lines* (2007), *Being Alive* (2011), *Making* (2013), *The Life of Lines* (2015), *Anthropology and/as Education* (2018), *Anthropology: Why it Matters* (2018), *Correspondences* (2020) and *Imagining for Real* (2022). Ingold is a Fellow of the British Academy and the Royal Society of Edinburgh. In 2022 he was made a CBE for services to Anthropology.

Xavier Luján Estellés is a forestry engineer and farmer. He founded and directs Vorasenda, an agroecology project located in Carpesa (Valencia, Spain) and active since 2010. Vorasenda's work is based on the principles of community-supported regenerative agriculture and is endorsed by Ecollaures, a participatory guarantee system distributed throughout the Valencian territory that promotes the values of self-management, agroecology and food sovereignty. Among Vorasenda's most recent initiatives is the creation of L'Alter, a food forest that is both a space for artistic and cultural production related to the rural world.

Cyrrilla Mozenter is a New York-based artist known for her gouache-painted, pencil-drawn (and written) works on paper and hand stitched industrial wool felt freestanding and wall pieces that include the transplantation of cutout letters, letter-derived and pictogram-like shapes. Many of the titles and words that appear in the work come from Gertrude Stein's writing. They are playful and absurd, defying singular interpretations. Solo exhibitions include *See Why* and the failed utopian & Other Stories, FiveMyles, Brooklyn; *warm snow*, Adam Baumgold Gallery, NY, and the Garrison Art Center, Garrison, NY; *More saints seen*, The Aldrich Contemporary Art Museum,

Ridgefield, CT; and *Very well saint*, The Drawing Center, NY. *Octave*, her bilingual collaborative book with photographer Philip Perkis was published in 2020 by anmoc press, Seoul. A 2020 Guggenheim Fellow, she has also received two fellowships from the NY Foundation for the Arts and two project grants from The Fifth Floor Foundation. Her work is in numerous public collections including the Brooklyn Museum and the Yale University Art Gallery. She taught for many years in the MFA program at Pratt Institute.

Chiara Sgaramella is an artist and researcher at the Universitat Politècnica de València (Spain). Her work explores the intersections between collaborative practices and ecology-related art in the contemporary scene. She was a visiting scholar at the Center for Creative Ecologies at the University of California (Santa Cruz, USA, 2018). She is currently a member of the Art, Globalization, Interculturality research group at the University of Barcelona. Alongside her academic activities, she develops artistic and cultural projects focused on socio-environmental issues. Her work stems from the hybridization of different languages and knowledge systems, proposing critical reflection on issues related to agriculture, food sovereignty, and the use of soil.

David Waltner-Toews is a veterinary epidemiologist and University Professor Emeritus at the University of Guelph. He was founding president of Veterinarians without Borders / Vétérinaires sans Frontières – Canada (www.vetswithoutborders.ca/) and a founding member of Communities of Practice for Ecosystem Approaches to Health in Canada (www.copeh-canada.org). In 2010 the International Association for Ecology and Health presented him with the inaugural award for contributions to ecosystem approaches to health, and in 2019 he received an award from the World Small Animal Veterinary Association recognizing “veterinarians who have exhibited exceptional acts of valour and commitment in the face of adversity to service the community.” In 2022 he was appointed as an Officer in Order of Canada, one of the highest honors given by the Canadian government for citizens who make extraordinary contributions to the country. Besides being an author of many scholarly books and articles, he has published six books of poetry, a collection of recipes and dramatic monologues, a collection of short stories, two novels and various books of popular science.

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Jackie D.

a cura di Leonardo Caffo e Maurizio Ferraris

Numero 2 • 2014

Architettura e animali

a cura di Mario Carpo e Valentina Sonzogni

Numero 3 • 2015

Narrare, graffiare

a cura di Natale Fioretto ed Emanuela Jossa

Numero 4 • 2015

Cinema: animale razionale

a cura di Silvio Alovisio ed Enrico Terrone

Numero 5 • 2016

Amor, c'ha nullo amato... amar bestiale

a cura di Domenica Bruni e Marco Ferraguti

Numero 6 • 2016

Psicoanimot

a cura di Felice Cimatti

Numero 7 • 2017

Das Animal

a cura di Daniele Balicco e Cecilia Canziani

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A partire da Tiziano Terzani

Leonardo Caffo e Valentina Sonzogni
con Angela Terzani

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