



HYPERORGANICS

VOL. 4

VEGETAL COSMOGONIES AND ART

Carl Hayden Smith and Roseanne
Wakely / Edward Shanken / Jeremy
Narby / Luis Eduardo Luna / Olga
Kisseleva / Roy Ascott



Carlos Augusto M.
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PRESENTATION

Hyperorganics events and published collection are actions supported by the Graduate Program in Visual Arts of the School of Fine Arts, from the Federal University of Rio de Janeiro, organized by the Research Group Nucleus of Art and New Organisms (Núcleo de Arte e Novos Organismos) – NANO, under the coordination of professors Guto Nóbrega and Malu Fragoso, from the Interdisciplinary Poetics line of research. Centered on the relationship between different technologies, art and the context in which human actions unfold and give meaning to life, Hyperorganics is characterized by a vertical approach, bringing together undergraduate and graduate students, and at the same time a horizontal one, by connecting university and society, nature and culture, art and the world, blurring the boundaries between the universe of so-called new technologies and that of traditional practices. Thus, it seeks to promote integration between knowledge legitimized by science, in the conventional sense, and knowledge of indigenous peoples, whether visible or invisible, verbal or non-verbal.

The fourth volume of the Hyperorganics collection brings together thoughts around the theme “Vegetable Cosmogonies and Art”. In it, we find essays by researchers translated into Portuguese, reinforcing transnational dialogues. Among the multiple guidelines of contemporary debates, the one that focuses on the Anthropocene and the sustainability of the planet has gained greater visibility and interest in artistic production and the resulting reflection, both in propositions that are specifically dedicated to the universe and the presence of plants in its propositions, as well as in the knowledge and transcultural practices that unfold from the knowledge that derives from this plant world. Thus, the publication reinforces, from a reflective and integrative perspective, the criticism of a *modus operandi* in

which different views of the world and ways of life, rather than in opposition, need to be seen in constant interchange.

If plant cosmogonies are presented as an area of transdisciplinary interest, it is from poetic experimentation that they are approached in this publication, reinforcing the production of contemporary art beyond the technical universe and an autonomous thought turned in on itself. In this key, from a perspective of the now, disciplinary and cultural territories, as well as dilated and transversal temporalities, point to a reflection and production committed to an ethical and aesthetic dimension in transformation, since it is no longer possible to sustain practices not connected with multiple dimensions and diverse knowledge, unilateral and supposedly universal conceptions of the world. In this sense, we are experiencing a process of reframing the concept of “art”, still in progress, of which we do not fully understand, and such initiatives allow us to envision some of the possibilities for this other understanding.

Ivair Reinaldim

Coordinator of the

Graduate Program in Visual

Arts PPGAV-EBA/UFRJ.

PREFACE

The theme of this volume of the Hyperorganics collection is "Plant Cosmogonies and Art", a subject that guides an incursion into the universe of plants from a poetic perspective. It takes as its starting point ideas that seek to reconcile scientific, technological and ancestral knowledge in an integrative, hybrid and transcultural way, in order to think about art in its relationship with nature. Taking into account domains such as plant entheogenic reality, plant intelligence, visionary art, shamanism, biotelematics and traditional knowledge about nature, rooted in the tradition of native peoples and their practices, this edition of Hyperorganics seeks to give light to ideas that allow us, beyond an anthropocentric vision, to consolidate and maintain a listening place for plant cosmogonies, their myths and magic. Is it possible to take a look at the world we live in that is not hegemonic? One that is not based on a predominantly human-centered vision, or that at least considers other ways of feeling and existing in its deliberate construction of reality? By proposing the theme of Plant Cosmogonies and Art, we open ourselves up to investigating the reality that surrounds us from other senses, practices, rituals and methods, embracing systemic shifts and their immense challenges.

In their text, Carl Smith and Roseanne Wakely speculate on the possibility of hacking the Umwelt of other beings and lead us to reflect on how such resignification can affect our knowledge or the awareness that we human beings have of the world. When we realize that we are limited to the Umwelt that surrounds us as a human species, when we become aware that we can only look at the world from this perspective, even more so, when we become aware that this is just one of infinite perspectives of being in the world, we recognize our smallness in the face of the wealth of possible universes to explore. In this

sense, Smith and Wakely propose experiments that venture into the way of touching the reality that surrounds us through the creation of sensory interfaces, with which it would be possible to try to understand, or perhaps feel, the strategies that other beings develop to communicate and connect with each other.

Hacking into knowledge, exploring, bringing it out into the open, dialoguing or even collaborating with other species is perhaps a way of fostering methods and technologies that will benefit the planet and life as a whole, as well as prioritizing the comfort of the human species. In her own way, Olga Kisseleva set out to create apparatuses, or devices, that serve as an interface for communication between plants, specifically trees. When installing her devices, the role of the artist-scientist, as Olga calls him, is to enable a data transmission network, which interconnects the transit of information between individuals and trees, like an old-fashioned telephone operator. With her devices, Olga not only wants to offer humans a system of cognition or communication that enables a broader perception of plants, but above all, that this communication can be established from tree to tree. Therefore, as well as hacking the plant's Umwelt, Olga places herself in the position of an agent who seeks ways of collaborating with these living beings through technology and art.

In "Emergent Mind: Art in the Technoetic Dimension" Roy Ascott deals with some concepts, namely moistmedia, technoetics, cyberperception, to draw parallels between states of double consciousness, experienced both in the telematic use of information networks and through plant technologies, which he calls "Vegetal Reality". In an analogy to the shamanic experience, Ascott invites us to perceive interactive art away from a certain voyeuristic and dichotomous scenario between interactive scene and audience, and proposes that we think of interactivity as an instrument of spiritual action whose use

implies the structuring or restructuring of first-person psychic forces in the systemic context of the artwork. Still considering the theme of consciousness, but under the aspect of a dual experience, Edward Shanken presents us with his first-person journey, an incursion into the universe of shamanism and art, inviting us to reflect on how certain artists adopt an expanded consciousness through the union of ancestral visionary techniques and contemporary techno-scientific tools. Shanken reiterates art as an instrument of planetary healing and, recalling Jack Burnham, invites us to think of art as a "psychic dress rehearsal for the future".

Visionary consciousness is also addressed in Luis Eduardo Luna's article about his fruitful collaboration with Pablo Cesar Amaringo Shuna, a Peruvian shaman artist whose art became notorious for giving visibility to the mystical dimension of *mirações*, known as visions caused by the use of the ayahuasca entheogen. From his first experiences with ayahuasca to his contact with the McKenna brothers, Luna reveals how Terence influenced him in his decision to dedicate part of his life to research into the use of sacred plants and how he came to know Pablo Amaringo, a plant scientist and specialist in the use of ayahuasca, sacred tobacco and other master plants. In his article, Luna introduces us to the visionary dimension of Pablo's images, some of which he comments on in detail.

Finally, in his interview, Jeremy Narby deals with themes such as bicognitivism, bilingualism, to show us that we can navigate multiple systems of knowledge, that there is no single truth but rather different perspectives for accessing the world and that we need to be careful to observe things very well before jumping to conclusions. He warns us, for example, that an experience derived from an indigenous shamanic perspective, instrumented by plants, in this case the combination of

the vine *Banisteriopsis caapi* (jagube) with *Psychotria viridis* (rainha) which results in the tea popularly known as ayahuasca, takes place outside the Western logocentric domain. In this sense, we can be led by such experiences to get closer to other forms of knowledge and their systems, to really put ourselves in the place of the other, outside the domain of language.

Therefore, this volume of *Hyperorganics* contains texts that invite us to reposition our worldview beyond the comfort zone subscribed to in our *Umwelt*. Plant cosmogonies, circumscribed in the ancestral culture of native peoples, their rites and magic, may offer us tools for a necessary realignment of our listening to the natural phenomena of which we are an integral part. We are fragments of a whole, which the systemic experience of art helps us to perceive. We invite our readers to reflect on how to develop ways of navigating the complexity that lies ahead.

Carlos Augusto M.
da Nóbrega and Maria
Luiza P. G. Fragoso

EMERGENT MIND: ART IN THE TECHNOETIC DIMENSION

Roy Ascott

In both art and science now, the matter of consciousness is high on the agenda. Science is trying hard to explain consciousness, with distinctly limited success: it seems to pose the most intractable of problems. For the artist, consciousness is more to be explored than to be explained, more to be transformed than understood, more to be reframed than reported. As for conscious experience in itself, there is nothing we know more closely than our inner sense of being, and there is nothing we can experience with less comprehension than the conscious states of another. It may be that only the profound empathy of mutual attraction, “love”, if you will, can break this barrier, but neither reductionist science nor our current commercialised – one could say “biennialised” – aesthetic could possibly countenance such an assertion. Fortunately there are signs that science is becoming more subjective and the *biennial dominance* is on the wain. There is no doubt that both scientists and artists are curious about the ways that advanced technology can aid in the exploration of mind. And advanced technology itself is calling into question our definitions of what it is to be human, and what might constitute an artificial consciousness in the emergent forms of artificial life.

I introduced the term *technoetics* into my vocabulary because I believe we need to recognize that technology plus mind, “tech-noetics”, can not only enable us to explore consciousness more thoroughly, but may lead to distinctly new forms of consciousness, new qualities of mind, new forms of cognition and perception, and the resetting of art.

It is my contention that not only has the moment arrived in western art for the artist to recognize the primacy of consciousness as both the context and content of art, and the object and subject of study, but that the very provenance of art in the previous century leads, through its psychic, spiritual and conceptual aspirations, towards this technoetic condition.

Perhaps I only need pointing to the examples of Duchamp, Kandinsky, Klee or Boccioni, early in that century, to indicate the roots of this tendency. It is equally clear that the impact on art practice of technology, especially digital and communications technology, has been to reduce art, in many cases, to a form of craft in which polished technique or skilful programming, leading to dazzling special effects, have come to replace the creation of meaning and values. A resonance with William Morris' 19th century Arts and Crafts movement springs to mind. There was then the same process of dumbing down from art to craft, in which the authoring of technique took primacy over the authoring of ideas, a pandering to the luxury market covered by a veneer of social conscience.

A more optimistic view is that our concern in digital art with *whole systems*, that is, systems in which the viewer or observer of the artwork plays an active part in the work's definition and evolution, represents at the very least a yearning to embrace the individual mind by a larger field of consciousness. By this account, the employment of telematic hypermedia is no less than a desire to transcend linear thought by reaching for a free-flowing consciousness of associative structures. It then becomes the artist's imperative to explore every aspect of new technology that might empower the viewer through direct physical interaction to collaborate in the production of meaning and the creation of authentic artistic experience. I shall return to the theme of interactivity in art at a later stage, since I see it as both emblematic of the desire for shared consciousness and problematic in its assumed resolution of the object/process and observer/participant dichotomies.

But first, I address the notion of double consciousness and its relationship to art. By double consciousness I mean the state of being which gives access, at one and the same time, to two distinctly different fields of experience. In classical

anthropological terms, it is describing the shamanic “trance” in which the shaman is, both in the everyday world and at the same time navigating the outermost limits of other worlds, psychic spaces to which only those prepared by physical ritual and mental discipline, aided often by plant technology, are granted access. In post-biological terms, this is mirrored by our ability, aided by computer technology, to move effortlessly through the infinities of cyberspace while at the same time accommodating ourselves within the structures of the material world, leading the advent of *moistmedia art*.

To research this apparent parallelism between shamanic space and telematic space, and the double consciousness that seems to be a part of both fields of experience, I have spent time immersed in the virtual reality of advanced computer systems and in the traditional reality of a native Indian tribe – that is to say, under the influence of the computer and of the plant, albeit extremely powerful computer systems and a particularly potent brew (ayahuasca, the “vine of the soul”), commonly made of the *banisteriopsis caapi* vine and the *psychotria viridis* shrub. My introduction to the psychic world was in the very heart of Brazil, with the Kuikuru pajés (shamans) from the Xingu River region of Mato Grosso, and through my initiation into the ritual of the Santo Daime community in Brasília.

The shaman is one who “cares” for consciousness, for whom the navigation of consciousness for purposes of spiritual and physical wholeness is the subject and object of living. Consciousness occupies many domains. The pajé is able to pass through many layers of reality, through different realities. In his altered states of awareness he engages with disembodied entities, avatars and the phenomena of other worlds. He sees the world through different eyes, navigates the world with different bodies. In parallel with technologically aided cyberception, this could be called psi-perception. In both cases it is a

matter of the double gaze, seeing at once both inward realities and the outward surfaces of the world.

The double gaze and double consciousness are related. In my experience of ingesting the ayahuasca I entered a state of double consciousness, aware both of my own familiar sense of self, and of a totally separate state of being. I could move more or less freely between these two states. Similarly with my body: I was at one and the same time conscious of inhabiting two bodies, the familiar phenomenology of my own body sheathed, as it were, in a second body which was made up of a mass of multi-colored particles, a million molecular points of light. My visual field, my double gaze, alternated, at choice, between the coherent space of everyday reality and a fractal universe comprising a thousand repetitions of the same image, or else forming a tunnel in space through which I could voluntarily pass with urgent acceleration. I could at any point stop and review these states, moving in and out of them more or less at will.

Many shamanic tribes not only enhance their psi perception by drinking the ayahuasca on a regular basis, but their culture, by adoption, has given rise to a ritualized practice known as Santo Daime, which has spread to most parts of Brazil, not least in its urban and metropolitan areas. In addition to the ritual drinking of the ayahuasca, Santo Daime has precise architectural and social codes. The design of the building that houses the ritual, the ordered placing of participants in that space, the rhythmic structure of the music, the pungency of the incense, the repetitive insistence of intoned phrases, punctuated by extended periods of absolute silence, the recurrent demand to stand or sit, one's own inclination to move into and out of the new field of consciousness that the ceremony and the drink together induce, leads one's awareness to fluctuate between the two realities. It raised the question, of course, of the way in which specific protocols and conditions

control or construct a given reality, and leaves unanswered the question of where or how or indeed if *the* ground of reality might be identified or even be said to exist.

This immersion in a controlled environment, affecting sight, touch, taste, smell, and hearing respectively, conferring on the mind the ability both to induce and create new conceptual and sensory structures (new “qualia”), while at the same time giving the freedom to step aside from the visionary experience, back into the “normal” field of experience, is mirrored to an extent in our artistic aspirations using digital technology, as for example in Virtual Reality, hypermedia, multimedia installations and, with its superimposition of cognitive schemas on real world situations, the fast developing field of Augmented Reality.

In both cases there is a kind of rehearsal of the Sufi injunction to be “both in the world but not of the world”, although the original context of that phrase is more emphatically spiritual than perhaps many artists would want to acknowledge. Here technology plays an important part in the experience of “double consciousness”, just as it is clearly integral to our emergent faculty of cyberception and the double gaze. It is as if, through our bio-telematic art, we are weaving what I would call a shamantic web, combining the sense of shamanic and semantic, the navigation of consciousness and the construction of meaning.

Historically, our command of the material world has been such that we have little option but to keep the worlds of our double consciousness in separate and distinct categories, such as the real, the imagined, the spiritual. The advent of the Artificial Life sciences, in which I include both dry (pixel) and moist (molecular) artificial organisms and the whole prospectus of nanotechnology, points to the possibility of eroding the boundaries between states of mind, between conception and

construction, between the internalization and the realization of our desires, dreams and needs of our everyday existence. Let me give you an example which can be found in our cyberception of matter at the atomic level. The scanning tunneling microscope (STM) enables us not only to view matter at this level, but to view individual, single atoms. However, the real significance of this process does not end there. Not only can we select and focus on individual atoms, but we can, at the same time, manipulate them, one by one, atom by atom, to construct from the bottom up atomic structures of our own choosing.

This means that, in an important sense, the prosthesis of vision can be at one and the same time instrumental in constructing what is envisioned. To see in the mind's eye is to realize in the material world. The worlds of the double consciousness, supervenient as they are on the processes of the double gaze, become less distinctly separate. The immaterial and material lose their categorical distinction. Cyberception is as much active and constructive as it is receptive and reflective. As this kind of double technology develops, and it is doing so at an accelerated rate, artists, no less than the philosophers and neuroscientists, must increasingly turn their attention to what we can call "techo-qualia", a whole new repertoire of senses, and to a new kind of relationship between the tools of seeing and building.

I return, at this point, to the question of interactive art. At the moment, by its structure, placement and presentation (which is generally in a traditional museum or gallery space), the work of interactive art presupposes, in spite of itself, an audience of more or less passive observers, just as much as it proposes a participant in open-ended interaction with at its interface. In this sense, the total system including the participant viewer, however dynamic a process it may be, is actually incarcerated within the very status it despises, that of

pure object – an envelope, bracketed in space and time, to be viewed by a second observer. This creates a dichotomy between the aspiration toward open-ended evolution of meanings and the closure of an autonomous frame of consciousness, a contradiction that necessitates the removal of the second observer and the phantom audience from the cannon of interactive art.

Here, by way of contrast, the shamanic tradition may usefully be invoked. All the activity of the pajé, and of those who interact with him in image making, dancing, chanting, making music, is performative but is not intended as a public performance. It is never played to an audience, actual or implicit. No one is watching or will be expected to watch what is being enacted. This is not a public performance, but a spiritual enactment which entails the structuring or restructuring of psychic forces. To paint the body elaborately, to stamp the ground repeatedly, to shake the rattle, to beat the drum, to circle round, pace back and forth in unison: all of this means invoking these forces, conjuring hidden energies. This is an enactment of psychic power, not a performance or cultural entertainment. This perspective, although seen at a great distance from our current hypermediated culture, may be of value in our consideration of the function of works of interactive art, thereby avoiding the double observer, the phantom audience. Art as an enactment of mind implies an intimate level of human interaction within the system which constitutes the work of art, an art without audience in its inactive mode.

Eschewing the passive voyeur, the traditional gallery viewer, this technoetic aesthetic speaks to a kind of widespread intimacy, closeness on the planetary scale.

So what then is the role of the artist in an art which increasingly sees its content and meaning as created out of the viewer's interaction and negotiation? An art which is unstable, shifting and in flux; an art which parallels life, not through

representation or narrative, but in its processes of emergence, uncertainty and transformation; an art which favors the ontology of becoming, rather than the assertion of being; an art moving towards a post-biological rematerialization; an art of enactment, without audience. An intimate art, the free-flowing outcome of interaction between participant viewers within networks of transformation. An art, in short, which reframes consciousness, articulating a psychic instrumentality, exploring the mysteries of mind.

These are the questions which will define the art of this century, and they are questions which artists working at the furthest edge of the technoetic aesthetic are already beginning to ask. One answer may be found in the deep past, in the remotest parts of the planet, or simply within the double consciousness to which we all have access. It may be found in the role of the shaman, recontextualised in the bio-telematic culture but reaffirmed in its capacity for the creation, navigation and distribution of mind. Or it may be found as the conservator of what emerges from the complexity of interactions in the Net or from the self-assembling processes of artificial life. Whatever may be the case, one thing seems certain: the technoetic principle will be at the centre of art as it develops, and consciousness in all its forms will be the field of its unfolding.

TECHNOSHAMANISM: TOWARDS HYBRID TECHNIQUES OF AESTHETICS AND HEALING

Edward Shanken

INTRODUCTION: PERSONAL REFLECTIONS ON EMBRACING VISIONARY CONSCIOUSNESS

While leading a virtual masterclass on telematic art and telematic education in 2020, a member of the audience asked me where I saw art heading in the future.¹ My immediate answer was, “healing.” That response was based on a new direction that my scholarship has taken since 2018. Having dedicated over a quarter of century to writing and teaching about art and technology, which led to the holy grail of academia – tenured professorship – I paused for a moment and looked inward. I realized that I was out of balance. While building my career as a scholar, the left side of my brain – the critical, hyperrational side that academia demands – became highly developed and refined. I had mastered the ability to analyze things, break them down, and logically argue my perspective, supporting it with solid evidence. There is a great deal of right-brain creativity involved in these activities of synthesizing ideas, formulating arguments, and conveying them in a compelling way. However, that kind of creativity is very different than the sort of creativity involved in, for example, playing music or dancing. Such performative practices demand tuning in to the body to allow its knowledge to surface. They demand tuning in to the heart to allow its wisdom to flow. Much to my chagrin, I realized that these abilities were underdeveloped

1 My talk, “The Telematic Embrace of Art Education: Inventing the Future of Crowd-Sourced, Collaborative, Multilingual, Content Creation as Pedagogy” was part of the International Programme of Training “New Media for Teachers,” organized by Delma Rodriquez, Director of the Anilla Cultural Uruguay. The video of my talk with Spanish interpretation voiceover can be found at: https://youtu.be/38vYhy_8n2w.

or were stagnating in me. I wanted to get out of my head and become more centered in my body and in my heart. I wanted to go beyond creating and sharing knowledge – the driving force behind my career – and integrate joy and wisdom. It was time for a change.

So I began to dance, and to study dance, especially ecstatic dance and contact improvisation, and even rehearsed and performed at a local cultural center. I've played the piano my whole life, but only in my living room. Now I approach it with greater intentionality as an improvising musician and performer. After my friend, Brazilian-born musician and sound-healer Poranguí, remarked that my piano mediations were “the best sound healing I've had in a long time,” I came to realize that perhaps I had a responsibility to share my music outside of my home. Inspired by Poranguí, while sheltering in place during the early days of Covid, I did a few performances on Facebook Live, not really expecting anyone to listen. But I was wrong! One of my teachers, choreographer and priestess of Isis, Anandha Ray, loved my music and invited me to collaborate. With the help of technical wizards Andres Salgado and Matthew Galvin, she and I developed a series of four live-streamed, telematic, healing ceremonies for piano and dancers. Directed by Ray, I improvised on piano while the Quimera Ritual Dance group, comprised of dancing priestesses of Isis, performed “shamanic fusion dance”.² I was becoming a technoshaman!

I credit my teenage experiences of LSD and mushrooms with opening the path to my career in the arts. Like many Americans who are discovering or rediscovering the healing powers of plant medicine, my journey of rebalancing led me back to psychedelic (mind opening) or entheogenic (become

2 See, for example, our Blood Moon ceremony honoring the goddess Sekhmet: <https://youtu.be/Q1i0-QZ0BK8>.

divine with) substances. Although these two terms can be used interchangeably, I prefer “entheogenic”, which does not carry the connotations of 60s culture and places greater emphasis on a process of spiritual unity that exceeds the mind. I participated in ayahuasca ceremonies led by a shaman who never calls himself a shaman (which I interpret as a sign of authenticity), trained by Shipibo *mestres* (masters) in the Peruvian Amazon. I participated in a Santo Daime ceremony, in which ayahuasca (Daime) is consumed as a religious sacrament and music and movement play key roles in the ritual.³ I also went on a guided journey with “toad medicine”, extracted from *Bufo alvarius*, known as the Sonoran Desert Toad or Colorado River Toad, which contains 5-MeO-dimethyltryptamine. While related chemically to ayahuasca, for me, the effects of this medicine were like an exorcism and rebirth. I must mention that the poetic psychedelic dictum “set and setting” (one’s mindset and the physical environment) were crucially important factors in these experiences, factors that were sorely lacking in my teenage experiences with psychedelics. As many people who have participated in ayahuasca ceremonies have reported, the *icaros* or prayers that are sung and chanted by the shaman are a crucial part of the experience. Indeed, I have been told that shamans believe that the *icaros* are given to them by the spirit of ayahuasca, that the *icaros* are made up of the same consciousness and amplify each other. Just as the plant medicine itself combines leaves of the chacruna (which contains the psychotropic molecule DMT) and the stalk of the ayahuasca vine (which contains the MAOI-inhibitor harmine) so,

3 Santo Daime is a syncretic religion founded in Brazil in the 1930s by Raimundo Irineu Serra, or Mestre Irineu, and joins together multiple religious and spiritual traditions including Catholicism, African animism, and indigenous South American shamanism.

too, I believe, an ayahuasca ceremony combines a tea made from these plants with a highly evolved ritual, in which the *icaros* play a vital role as part of the overall medicine. In this regard, I must mention that Poranguí, who recorded the soundtrack for the 2017 documentary film *Ayahuasca*,⁴ firmly believes that music can, by itself, offer profound experiences of healing and unity, similar to those offered by plant medicine ceremonies.

Before I sought out plant medicine in 2019, my epiphanies about needing to rebalance, to go deeper into my body and heart, to integrate joy and wisdom had already taken place. These insights were not the result of entheogens but were catalyzed by other practices, including yoga, dance, and playing the piano, combined with cognitive behavioral therapy. This period of self-reflection set the stage for the plant medicine to work its magic. I opened my heart more fully to myself, embracing both the light and the shadow I discovered inside. By opening my heart more fully to myself, I was able to open my heart more fully to others. And opening my heart more fully to others enabled me to open my heart more fully to Earth, to Gaia, to Pachamama, to the love that underlies the unity of all things. I believe that these insights were gifts from Aya, the goddess of the jungle, the beloved personification of the spirit of ayahuasca, affectionately known as “abuelita,” who continues to dwell inside me. I discovered the power of surrender. I discovered the power of compassion. I discovered the power of gratitude. I discovered the power of prayer. In essence, I was making important strides in rebalancing and healing myself, in becoming a more whole and complete person. As I did so, my relationship to others and to the Earth became healthier, became more loving, more deeply

4 *Ayahuasca* (2020); directed by Mitch Schultz; conceived and produced by Aubrey Marcus; soundtrack by Poranguí. Available at: <https://youtu.be/HfM-HhLgDeY>.

connected. These transformations dramatically impacted my research and teaching, although I must admit that integrating these gifts into the framework of academia is a challenging and ongoing process. I share this journey in all humbleness, as a way of conveying the potency of the shamanic transformations I have experienced, as a means of fulfilling the service I have been called upon to perform.

Roots of these tendencies as a part of my professional path appeared in 1993, my first year as a doctoral student in art history. I was hooked when I read Roy Ascott's 1990 essay, "Is There Love in the Telematic Embrace?", which drew together the connectivity of computer networking, expanded consciousness, and love on a global scale. I was fascinated by how the artist's theory, practice, and pedagogy wove together art, science and technology, philosophy, cybernetics and parapsychology, with Native American cultural forms, the *I Ching*, and other divinatory systems. His work has consistently espoused expanded forms of consciousness and love. I interpret these aspects of Ascott's oeuvre as a means of transcending boundaries and creating more intimate forms of relationality through art, of "learning to inhabit the world in a better way" (Bourriaud, 2002). Ascott's work envisions alternative utopian futures and offers us the opportunity to taste them in the present. Although the term "healing" does not appear frequently in his work, I believe that ultimately his work performs a healing function by creating a space of possibilities for expansive forms of consciousness and love, by advocating for a systemic, holistic unity – an entheogenic state of hybrid being in which we become one together. I have come to see Ascott's work as an early (and ongoing) artistic example of technoshamanism, which shall be examined below in the section on Early Shamanisms.

I entitled my first book, which is a collection of Ascott's

essays, *Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness* (2003). When I look at the title now, nearly two decades later, the words that resonate for me are, and they appear in the same order in the title, “embrace... visionary... consciousness”. This phrase, which I take as an imperative call to service, has become a mantra for me. The telematics, the theories, the technology, the art are all very useful and inspiring. But the core of my interest is to embrace visionary consciousness. I believe that embracing visionary consciousness is fundamental to how shamans do what they do. It is a key to the pathway to healing.

SHAMANISM AND TECHNOSHAMANISM

Shamanism has a long, complex, and contested history that spans diverse cultures. The origin of the word can be traced to Siberia. However, limiting shamanism to any particular region or culture fails to recognize the significant parallels that can be identified across them. The title of Mircea Eliade’s classic 1951 account of the subject defines shamanism as “techniques of ecstasy” and acknowledges that shamanism across cultures is fundamentally a technology of healing that is “at once mysticism, magic, and “religion” (Eliade, 2004, p. xvii-xxvii). The shaman is at once revered and feared because of their powers. Often a shaman proves their shamanic potential through a self-healing process. The shaman is both of this world and of the world(s) beyond. They communicate with spirits and ancestors in other dimensions, learn from them, guide members of the community to them, and harnesses their power to heal and protect members of the community and the community as a whole. The shaman can embody the consciousness of other beings, including other animals, and in doing so, gain insight

into how, for example, humans can prey on large animals like panthers and alligators, that are far larger, faster, more powerful, and physically dangerous. They can exorcise evil spirits that have overtaken a member of their community, absorbing that spirit and then purging themselves of it. This can be extremely dangerous, so shamans must be very strong of spirit, capable of self-healing, and very knowledgeable of their craft.

Following the work of anthropologist and shaman Michael Harner, I take shamanism, at its core, to be concerned with healing and with sustaining life. As Harner – who founded the Foundation for Shamanic Studies – claims, shamanic traditions around the world have developed a broad range of technologies – from sonic drivers (drums) to plant medicine rituals – in order to achieve trance-states that offer insights beyond those available to typical waking consciousness (Harner, 2012). These insights have healing properties at many scales, from the individual to the global. I take technoshamanism to join together a combination of traditional shamanic technologies with emerging technologies – based in silicon (dry), biology (wet) and hybrid (moist) media, all in the service of healing and sustaining life.⁵ Emphasizing the technological aspect of shamanism, Brazilian scholar Fabiane Borges notes that,

It is important to view shamanism as a methodology, as a technology for the production of knowledge. It is also very important for technoshamanism: The realization that apart from any possible encounter between technology and shamanism, shamanism is itself a technology. It is not just about ecstasy, but about transhuman communication (Borges, c. 2014).

5 This triad of dry, wet, and moist reality was configured by Roy Ascott (1999) in “The Future is Moist”. In: *Art Inquiry: Recherches Sur les Arts* 1. Łódź: Łódzkie Towarzystwo Naukowe.

If, as Eliade and Borges claim, shamanism is itself a technical or technological method, then is the term “technoshamanism” redundant? What could such a term mean? My research on the topic is concerned with how artists embrace visionary consciousness and becoming divine together by joining ancient shamanic techniques with contemporary technoscientific tools. This hybrid technoshamanic aesthetic strategy promotes ecstatic trance states and can enable communication that transcends the human and stretches across all beings.

EARLY TECHNOSHAMANS

In 1997, Ascott participated in ayahuasca ceremonies with Kuikuru pajés of the Xingu River region, in the state of Mato Grosso, Brazil. In his 1998 essay, “Weaving the Shamantic Web...”,⁶ he described the shaman as “the one who ‘cares’ for consciousness, for whom the navigation of consciousness for purposes of spiritual and physical wholeness is the subject and object of living”. He witnessed the pajé “passing through

6 ASCOTT, Roy. “Weaving the Shamantic Web: Art and Technoetics in the Bio-Telematic Domain”. In: SHANKEN, Edward (ed.) (2004). *Telematic Embrace*. Berkeley: University of California Press, p. 356-362. Subsequent numbered quotations in this paragraph are from this source. Ascott uses the term “double-consciousness”, which I have modified to “dual-consciousness” to differentiate it from W.E.B. Du Bois’ use of the term “double-consciousness” in his social philosophy of African American identity around 1900. By hyphenating the term “dual-consciousness,” I intend to differentiate it from the controversial theory of “dual consciousness” in neuroscience regarding split-brain patients.

different layers of reality, through different realities...” engaging with “disembodied entities, avatars, and the phenomena of other worlds”. The shaman, according to the artist, inhabits a state of “dual-consciousness” of “seeing at once both inward realities and the outward surfaces of the world” (p. 358). Ascott theorized parallels between the dual-consciousness that emerges in shamanic ceremonies and the dual-consciousness afforded by emerging technologies. “In many respects,” he wrote, “this ancient ritual mirrors our contemporary artistic aspirations using digital technologies” (p. 359). Writing about the spiritual in art, he stated that shamanism and other archaic traditions “implicitly locate the human within a field of consciousness, rather than seeing consciousness as an epiphenomenon of the brain, as western materialist orthodoxies would argue”.⁷ This distinction is crucial for the technoshaman, who must walk a tightrope between the shamanic conception of consciousness as a ubiquitous field and the materialism of technoscience, which understands consciousness as a bi-product of grey matter, thereby sustaining another level of dual-consciousness. Brazilian-American artist/scholar Claudia Jacques claims that the visionary state of dual-consciousness that Ascott experienced with the pajés allows entry to a state of awareness that can only be suggested through “indirection, shared participation and metaphor. This is the realm that visionary thinkers, creative artists, and shamans alike aspire to experience and explore” (Jacques, 2018).

7 ASCOTT, Roy (2006). “Technoetic Pathways Toward the Spiritual in Art: A Transdisciplinary Perspective on Connectedness, Coherence and Consciousness”. In: Leonardo v. 39, n. 1, p. 66. Ascott notes that emerging scientific research in biophotonics and other fields may unsettle these “western materialist orthodoxies.

Ascott was on already headed in this direction before participating in shamanic plant medicine ceremonies. His 1989 telematic artwork, *Aspects of Gaia: Digital Pathways Across the Whole Earth*, incorporates a technoshamanic integration of digital technologies together with a shamanic emphasis on expanding consciousness and on healing individuals and the Earth as part of a unity. Created for the prestigious Ars Electronica festival, in Austria, this multimedia project took its inspiration from atmospheric scientist James Lovelock's holistic Gaia Hypothesis (1979), which posits that the Earth (Gaia) is a living organism, a self-regulating, complex system that maintains the conditions for life on the planet. The artwork explored "many aspects of the earth, Gaia, seen from a multiplicity of spiritual, scientific, cultural, and mythological perspectives" (Ascott, 1990, p. 244).

Invitations to participate were sent via email, fax, or airmail to artists, scientists, shamans, musicians, visionaries, and indigenous artists of the Americas and Australia. The installation was comprised of two main components: "information bars" inside the venue and a trolley running underneath the building. At the information bars, viewers could engage with, add to, and interact in real time with streams of digital images, texts, and sounds shared by participants around the world. Through "indirection, shared participation and metaphor" (to quote Jacques, above), the information bars suggested, for Ascott, a telematic "noosphere," a computer-networked version of Teilhard de Chardin's mid-twentieth conception of an evolved field of consciousness that emerges from individual consciousnesses and that "might contribute to the harmonisation of the planet" (Ascott, 1990, p. 244). Ascott likened the participants to healers who access the meridians of the earth's nodes and creatively interact with the flow of data to perform a type of "global acupuncture". The cerebral ephemerality of the

information bar was joined with the highly embodied somatic engagement of riding in the open-air trolley underneath the venue. Travelling in the trolley in a supine position through a darkened acoustic space, members of the audience passed by LED screens scrolling texts about Gaia that had been submitted by a global network of contributors. Ascott described this dark, womb-like environment as a telematic, neolithic passageway (Ascott, 1990, p. 245). The two main elements of information bars and the sonic and textual trolley, suggest a technoshamanic integration of the Earth's organic biosphere, with its telematic layer, the digital noosphere. In *Aspects of Gaia*, audience members become participants of an individual and collective process that engages the mind and the body with Gaia within a unified matrix of planetary consciousness and healing.⁸

For American composer and electronic music pioneer Pauline Oliveros, cultivating expanded forms of consciousness was the primary focus of her career.⁹ I see her as an early technoshaman. For Oliveros, the wisdom of the body is crucial to accessing expanded states of consciousness. "I have progressed through many changes in music technology from the end of the 1950s to the present," she wrote. "Along the way I developed a bodily relation to machines for making music. It has always been necessary... because of the essential knowledge of the body that is preconscious and nonverbal" (Oliveros, c. 2012). Her experience of performing improvised music parallels shamanic

8 Elements of this description of *Aspects of Gaia*... are drawn from an entry on Roy Ascott in the forthcoming *Encyclopaedia of New Media Art*, co-authored by Lila Moore and myself.

9 Parts of this section are drawn from SHANKEN, Edward and HARRIS, Yolande (2017), "A Sounding Happens: Pauline Oliveros, Expanded Consciousness, and Healing". In: *Sound-scape*, v. 16, p. 4-14.

dual-consciousness: Oliveros became a channel through which spirits from other dimensions could communicate with and heal us: “This altered state of consciousness in performance is exhilarating and inspiring,” she explained. “The music comes through as if I have nothing to do with it but allow it to emerge through my instrument and voice” (Oliveros, 2005, p. xix).

In accord with Ascott’s descriptions of shamans above, the “navigation of consciousness for purposes of spiritual and physical wholeness” was “the subject and object” of Oliveros’ life’s work. Her compositions develop attentional strategies – that may be likened to shamanic techniques – to enable performers and audience to, again borrowing Ascott’s description of the shaman, “pass through many layers of reality, through different realities”. Oliveros embraces emerging technology and is especially interested in applying it in ways that are intuitive or not purely functional. In “Quantum Improvisation” (1999), she lists the ideal attributes for a future artificial intelligence “chip” with which she could make music. They include the imaginable technical ability to calculate at speed and complexity beyond the human brain, as well as more abstract psychic abilities, that seem to parallel shamanic intentions of achieving unity and healing on a cosmic level. These include:

the ability to understand the relational wisdom that comprehends the nature of musical energy; the ability to perceive and comprehend the spiritual connection and interdependence of all beings and all creation as the basis and privilege of music making; the ability to create community and healing through music making; the ability to sound and perceive the far reaches of the universe much as whales sound and perceive the vastness of the oceans. This could set the stage for interdimensional galactic improvisations with yet unknown beings (Oliveros, 2010, p. 53).

For Oliveros, expanded consciousness on a galactic scale was the foundation of healing, a form of service that she performed within the frame of a feminist ethics of care.

Chilean artist Juan Downey is another early technoshaman.¹⁰ His artwork deployed video as a shamanic device to expand consciousness and reveal alternative realities. Traveling throughout North and South America with his Sony Portapak in tow, he lived with indigenous people in their own conditions. Downey spread the gospel of video, enabling members of his host tribes to record themselves and their traditions, and also documenting them himself. He then spread those videos across cultures, offering a scathing and ironic critique of Western bigotry and prejudice wherever he encountered it. His 1979 video, *The Laughing Alligator*, is one extraordinary outcome from the many months he and his family lived with the Yanomami people in southern Venezuela, on the border of Brazil. In his first appearance, Downey is bare-chested as he undergoes a shamanic ritual at the *shabono* (communal dwelling). He participated with his Yanomami hosts in rituals using yopo, a plant medicine derived from the seeds of the yopo tree (*Anadenanthera*), which contains a combination of 5-HO DMT (bufotenine), DMT, and 5-MeO DMT.

As documented in *The Laughing Alligator*, yopo rituals involve having a helper blow the medicinal snuff through a straw, deep into one's nasal cavity, a technique that quickly and powerfully releases its entheogenic effects. The artist came to regard shamanism as one of the most powerful elements in

10 Parts of this section on Downey are drawn from SHANKEN, Edward, "Pushing the Limits. Surrealism, Possession, and the Multiple Self: Juan Downey and *The Laughing Alligator*". In: HERRERA, Maricris (ed.) (2019). *Juan Downey: 1940-1993*. Mexico City: Ediciones MP, p. 527-542.

the bond that linked the Yanomami to their surroundings, to the earth, and to each other as part of a larger unity. Although he began his stay determined to focus on video and to avoid drawing, he soon found that drawing spirals was the only way to access his visions after meditating each morning. As he wrote, “A white and round place opens up in the front of my brain. Excretions of light that vaguely align into circles, the intensity of a spiral or the infinite peace of a mauve color. [...] I want to enter into the white space of my empty consciousness” (Downey, 1977).



Figure 1.
 Juan Downey,
Laughing Alligator,
 1979. Screenshot
 of Yanomami men in
 a yopo ceremony.
[https://youtu.be/
 uylbwsSn1lM](https://youtu.be/uylbwsSn1lM)



Figure 2.
 Juan Downey,
Laughing Alligator,
 1979. Screenshot of
 Yanomami man re-
 ceiving yopo. Video
 colorized by the
 artist. [https://you-
 tu.be/uylbwsSn1lM](https://youtu.be/uylbwsSn1lM)

Downey’s drawings of spirals are deeply meditative and demonstrate, moreover, the healing power of mind over matter.

According to his widow, the artist had a visible tremor but the tremor went away completely when he was drawing (Downey, 2017). Drawing was, for Downey, a form of meditation, a shamanic technique, that drew him into trance-like states and allowed him to access forms of knowledge and wisdom that lay outside of rational, analytic thought. Drawing enabled him to overcome his tremor and to create fluid lines that channeled cosmic energy. From spending a lifetime in trance-like states, the artist expanded his consciousness. He tuned into the consciousness of others. And he helped others do the same. As a result, Downey's work plays an important role in stimulating new ways of thinking that are the prerequisite to healing society's pathologies and to recreating the world in a more sensitive, inclusive, and caring way.

CONTEMPORARY TECHNOSHAMANS

The term "technoshamanism" has been used to refer to a broad range of social and cultural manifestations, including healing modalities and spiritual rituals, rave culture and electronic dance music (EDM), and various digital arts practices involving installation, performance, and VR. Given the vibrant shamanic cultures of the Amazon basin, it is not surprising that Brazil has been a hotbed of technoshamanic research. Indeed, I have learned a great deal from the work of Brazilian artists and scholars who have made art, produced events, and published papers about technoshamanism.¹¹ Their work has deeply informed my understanding of the term and I hope to share

11 These include Diana Domingues, Fabiane M. Borges, Adriano Belisário Feitosa da Costa, Pedro P. Ferreira, and the Tecnoxamanismo network. There are undoubtedly many others.

ideas and learn more from them and others, face-to-face, in Brazil and other parts of Latin America.

I began investigating this vague and ephemeral topic as a possible theme for an undergraduate seminar at University of California, Santa Cruz. I posted a query on Facebook asking for suggested writings and artworks related to Technoshamanism. I was delightfully surprised by the response: I received over one hundred comments! This convinced me that the concept was very relevant, that there is, as we say in English, a “there” there; in other words, there was something about the term that was sufficiently substantial that it resonated with many people. I am particularly concerned with how contemporary artists pursue expanded forms of shamanic consciousness through the use of technoscientific tools, creating mixed realities that constitute hybrid technoshamanic aesthetic experiences. As this area of artistic practice is nebulous and undefined, I have begun to identify some key artistic and theoretical monuments in order to help demarcate this amorphous field. My approach is not to begin from theory and find examples to illustrate it, but rather to allow a field to emerge by bouncing theory and practice off of each other in dialog with artists, shamans, medical professionals, engineers, and other interested parties. I would like to give two contemporary examples of Technoshamanism: Native American artist Anandha Ray’s *Covenant VR* and Korean artist Kim Jeong Han’s *BirdMan*. Although these works are not well known, they are, for me, two of the best examples of Technoshamanism that I have encountered.

Dancer and choreographer Anandha Ray is based in the San Francisco area. As a teacher, she developed the Shamanic Fusion Dance method, with which she trains members of her company, Quimera Ritual Dance, as mentioned in the introduction. She is also an ordained priestess of the ancient Egyptian goddess Isis, and has guided many initiates into the

priesthood. I became aware of her work in July 2019 at the San Francisco Movement Arts Festival (SFMAF). While there, someone came running up to me, “Edhi! Edhi! Have you seen the virtual reality dance piece?” It was a new friend that I’d met – not surprisingly – at an ayahuasca ritual a few months earlier. Given my “shift” and new focus on dance and embodiment along with my ongoing fascination with art and technology, this sounded captivating to me.



Figures 3 and 4. Anandha Ray and Gary Yost, *CovenantVR*, 2019. Screenshot of two perspectives of the same moment in the 3D virtual reality experience. https://youtu.be/Y-B_KqbrS4w



My friend walked with me to an adjacent building at Grace Cathedral, the venue hosting SFMAF. A beautiful young woman wearing all white greeted us and led me inside to a nondescript room with many computers and thirty high-definition VR headsets. After Yost gave a brief explanation of the work, we

were instructed to put on our headsets. The next thing I knew, Bam! I was suddenly transported to a dance rehearsal studio, at a virtual distance no more than a meter from a striking, dark-skinned dancer (Linda Steele II.) Ray is coaching her, asking her to reveal her innermost self. In the VR environment it feels as though we are right there in the action, far closer than front row seats, inhabiting a perspective and proximity typically seen only by other dancers. Our view is not limited to a frontal perspective, as we may explore all 360 degrees up, down, front, and back. Ray implores the dancer: “Who are you? What do you have to reveal to us? Show us your secrets! Let us see you...” The dancer lets out a deafeningly silent scream and we are transported into a small temple. She is now dressed in a white feather cape over a black lingerie with garters, a white chimera line painted down the middle of her face. Ray appears in a white robe as a priestess of the goddess Isis and performs a sacred incantation as other priestesses, also dressed in white, circle the dancer and perform a serpent ceremony, laying ball pythons on her. The scene changes to the inside of Grace Cathedral, in San Francisco, where the dancer appears in the nave. Her dark upper-arms yield to light-skinned forearms and hands. We have a sudden recognition that the virtual environment we are inhabiting is the same one that our physical bodies are inhabiting – that this is a site-specific VR artwork. Another set of light-skinned forearms and hands appear and begin touching and groping the dancer’s upper body, overwhelming her. This extended scene explores the relationship between the main dancer and the other two dancers (Treestar Tinkerbella and Lael Marie), which might be interpreted as shadow aspects of herself. If we shift the direction of our gaze, animated specters appear in the wings. Sometimes the three aspects dance in harmony, while at other times there is a struggle between the lead dancer and the shadows, who physically restrain the dancer, suggesting a psychological or

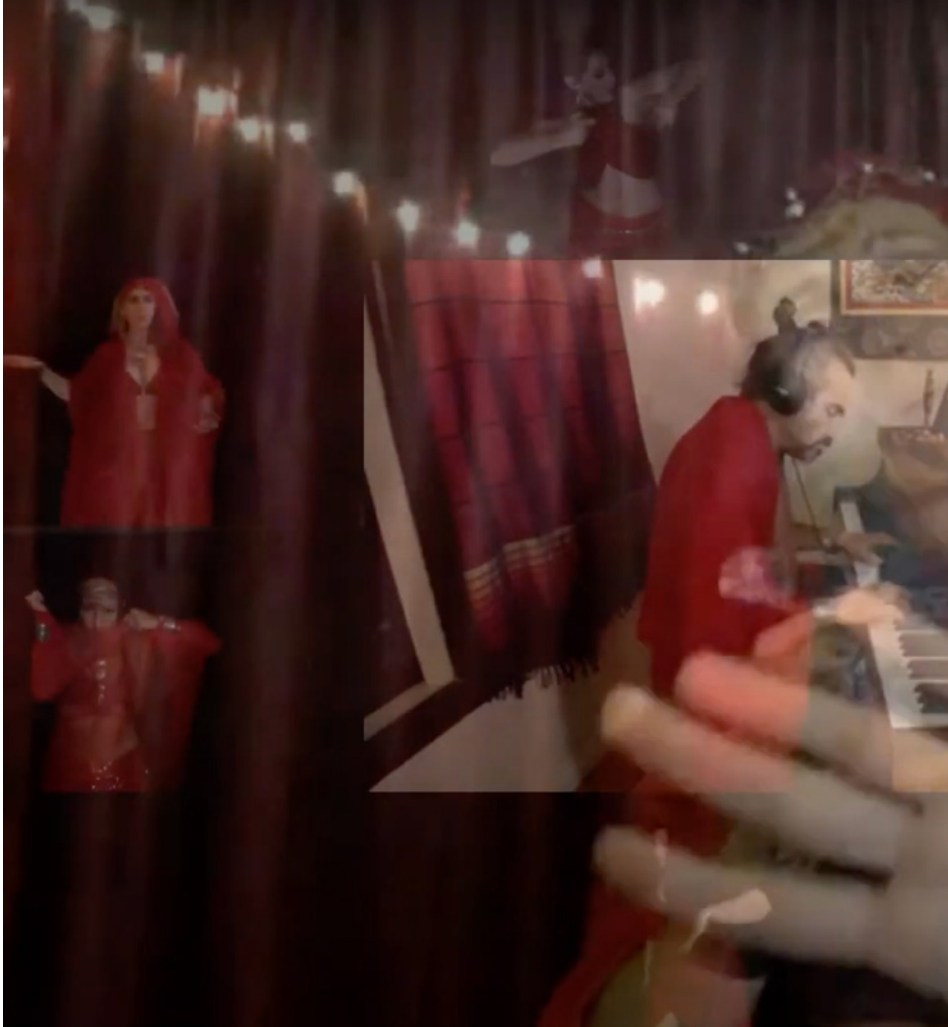




Figure 5.

Anandha Ray, Edhi Shanken, Andres Salgado, Matthew Galvin, and Quimera Ritual Dance, with priestess Ayah Buonaugurio, "Remembering the Ancient Future: Blood Moon", Nov 30, 2020. Screenshot of video of live-streamed webcast. <https://youtu.be/Q1iO-QZ0BK8>

spiritual constraint that she ultimately overcomes in an emotionally charged moment, an exorcism resulting in catharsis, release and rebirth. As viewers enmeshed in the VR experience, we witness the shamanic ceremony from a privileged perspective, so close that we can virtually touch the protagonist, a proximity that heightens our sense of being there, of witnessing the shamanic healing that transpires. Yost's cinematographic wizardry is the ideal match for Ray's shamanic approach to dance, which she has developed over more than two decades to "allow movement to open portals of inquiry to better understand the state of being human."¹² In *Covenant VR*, an extraordinarily compelling dance performance, exquisitely filmed in 360 degree 3D, and integrated with a responsive, immersive virtual reality platform result in an enthralling experience. This *tour-de-force* of technoshamanism literally took my breath away.

Korea has a rich, living tradition of shamanism that continues to inspire artists, including Jeong Han Kim, whom I consider to be a technoshaman. Inspired by Korea's shamanic and Buddhist traditions, he created *The BirdMan* (2005), a multimedia art installation. As mentioned above, shamans can embody the consciousness of other beings, including other animals. In this vein, *The BirdMan* asks some fundamental questions: How do human beings conceptualize the world? How do birds conceptualize it? Can a hybrid world that joins human and nonhuman qualia (the internal, subjective physiological component of sense perceptions) transform perception beyond the limits of human physiology? If new perceptions create new metaphors, can the experience of another species' perceptual reality help create hybrid perspectives, marked by greater empathy and ecological sensitivity?

12 Available at: <https://www.wisdomvr.org/phase01/2019/12/13/covenantvr>.

The concept of a hybrid bird-man appeared to Kim in a dream. Due to a traumatic childhood experience, even as an adult Kim's fear of birds prevented him from helping a one-winged bird that was suffering and dying. The guilt-ridden artist dreamed that he learned bird language from a monster with a bird head and only one wing. The dream and the artwork can thus be interpreted as an effort by the artist to attain catharsis and heal a trauma through aesthetic and shamanic means.

In Korean tradition, some shamans can share their own bodies with the deceased soul. Whenever a shaman is possessed by the spirit of the dead, s/he acts, speaks and senses like another person, as if borrowing the perception of the deceased. This moment looks like a coexistent state of the living body and the dead in which perception and identity of the two is hybridised (Kim; Kim; Lee, 2015, p. 56-64).

The Buddhist idea that “the ‘Self’” is not different than the “Other” is another prevailing concept in *BirdMan*. The work offers the audience an opportunity to experience a form of hybrid perception that joins human and avian “qualia”. Kim's work does not explicitly represent accoutrements or scenes of shamanic healing. As a result, the audience is not likely to identify the shamanic elements simply by looking at it. Rather, *BirdMan* is driven implicitly by a shamanic perspective. Kim leads his own ritual of self-healing through his artistic practice. By enabling us to metaphorically becoming one with bird, by offering us an experience of hybrid avian-human perception, his work enables us to expand our consciousness beyond the limits of our embodied human minds by joining self and other. It enables us to create new identities in between humans and non-humans. And, as a result of this, it enables us to create new metaphors to live by and to live *with*.

Such ideas echo Donna Haraway's ecofeminist theories of multispecies worlds. She advocates a concept of kinship or "making kin" that joins all beings: "all earthlings are kin in the deepest sense [...]. All critters share a common 'flesh,' laterally, semiotically, and genealogically." She applies the term "sym-poietic" to emphasize the collective process of poetic emergence in which all beings are collaborators in the process of the Earth's becoming. "Who and whatever we are, we need to make-with—become-with, compose-with [...]." Taking care of the Earth, for Haraway, demands caring for the diversity of beings, and "multispecies ecojustice" must be not only a goal but a means to living well, together, as kin. By "staying with the trouble," she proposes, "[m]aybe, but only maybe, and only with intense commitment and collaborative work and play with other terrans [inhabitants of Earth], flourishing for rich multispecies assemblages that include people will be possible" (Haraway, 2015, p. 159-165; 2016).

Buddhist luminary Thich Naht Hanh wrote in his beautiful book, *Love Letter to the Earth*, "Our own awakened consciousness is what can heal the Earth" (Hahn, 2013, p. 56). Indeed, the pressing and enduring concerns of global warming and the abuses of technology demand that we expand our perceptual domain in order to heal ourselves, our kin, and our planet. To do so, we must expand our metaphors and our means and channels of communication. We must summon the full power of art and technology, while we equally harness ancient shamanic technologies and other modes of entering trance, expanding consciousness, experiencing ecstatic states, fostering communication among all beings. If we want to have a future, the artists of the future must serve as beacons of hope and as active participants in healing the world and our relationship to it. Art, as a "psychic dress-rehearsal for the future", to quote Jack Burnham, must embrace kinship and harmonious

coemergence with all beings. We must become divine together. Today there is no greater artistic calling, no greater aesthetic necessity than helping to heal and preserve Earth/Gaia's biodiversity for posterity. Technoshamanism, I propose, is a potent strategy to move in that direction.

I dedicate this paper to my grandfather, Aaron Edward Fishman, MD. A musical prodigy who became a dedicated healer, making house-calls well into his 70s, his spirit continues to inspire and guide me.

Note: An earlier version of this paper was delivered as a keynote talk at the 10th International Meeting of Research Groups "Art, Science, Technologies Convergences and Mixed Realities", 6th-8th October, 2021.

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**UMWELT HACKING:
HOW DO WE BUILD
SENSORY BRIDGES
BETWEEN THE
FOREST KINGDOM,
A MYCELIUM
NETWORK AND AN
OCTOPUS?**

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INTRODUCTION

An Umwelt is the world as it is experienced by a particular organism, it is a “closed unit” consisting of all an organism can sense and act on. Our research asks if that private world is the only world it can know and experience.

Umwelt Hacking is not new: in 1974 a paper by Thomas Nagel, asked “What is it Like to be a Bat?” (Nagel, 1974), and in 1934 a theoretical biologist, Jakob von Uexküll, asked what it is like to be a tick (Von Uexkull, 1934).

Von Uexküll even did early Umwelt hacking experiments using a variety of media:

Von Uexkül does not just tell us what these umwelts are like. He shows us — or tries, anyway, using inventive illustrations and sometimes photographic gimmickry. In one series of his figures, a first photograph shows a village scene as we might experience it ourselves; the next shows the same scene photographed through a screen, to simulate the cruder visual resolution that others species experience. He then goes another step, photographing the photograph through a screen, rendering the village that much as coarser. As a fly might see it, or a mollusk (Cooperrider, 2020).

Humans have a habit of believing that they are separate and above nature. There is a prevalent culture based on an assumption that humans have the ultimate intelligence and that anything other than human intelligence is less than. These two factors have a major impact on how humans mistreat their environment. This also impacts upon the neurodiverse community, creating a feeling of being inadequate. We have a hypothesis that more empathy (and compassion) between people and nature could help close this gap. We have chosen to explore 3 entities from 3 kingdoms: Forest / Mycelium network / Octopus.

The goal is to make playful physical prosthetics that could create a bridge between what these entities experience and what humans experience.

It is very hard to think outside our own Umwelt. This is why we are creating prosthetics and using the body as a tangible interface: to create a transformational experience that allows people to experience a tangible liminal space outside of their Umwelt and make genuine conceptual changes. Not just talking about plants and animals being intelligent, but feeling it. Not just considering the intellectual point of view, but the point of view of the body.

For each kingdom we ask:

- Can we sense like a forest?
- Can we sense like a mycelium network?
- Can we sense like an octopus?

All three have a unique way of being in the world and experience life very differently.

NEURODIVERSITY

How do we recognise what is forest, when we don't even recognise what is human? We clear the understory in the same way we scrub our outer biome – removing essential elements and leaving areas barren and vulnerable.

Jay Cousins

Before considering the intelligence of plants and animals we considered valuing the diversity of different types of intelligence in our own species. We think there is a connection between

radically different sensing systems and intelligence within our own species. We see a value in neurodiversity, in brains working slightly differently. We are trying to explore understanding radically different sensing systems in the hopes that it will uncover a new understanding of different forms of intelligence.

One problem with our definition of intelligence is that we compare it narrowly to human abilities. We are, therefore, by default, very limited in our ability to understand these very different sorts of intelligence. Which is why we have created embodied wearable prosthetics, to allow people to comprehend different forms of intelligence in a more visceral way.

First, we sense, then we respond to those senses. The combination of that builds intelligence. There is actually one theory for how we built the ability to speak and think. That we made sounds, then heard them, then compared what we heard with what we had planned to sound like. And this circular series of events of sensing and acting led to the ability to speak and think.

In considering how differently a human senses from an octopus, it's important to consider how differently we sense from each other. To celebrate and value neurodiversity we sent a tool kit of hackable whisker packs (embodied wearable prosthetics) to several groups of people, including visually impaired performers, dyspraxics and makers, believing they would have a unique perspective on tactility. We left out how they should use or modify the whiskers open ended as we wanted to encourage user led ambiguous play and co-design.

DESIGN PROCESS

We have been developing methods and systems to hack the Umwelt of different kingdoms. It is important that our

prosthetics are based in knowledge that we base a solid understanding of the kingdom we are trying to experience. The overall intention is this process can be repeated to create a bridge between any Umwelt.

The design process is built from gathering insights from Umwelt experts. This includes scientists and researchers who are looking at mycelium networks, octopus and forests. As well as people who spend a lot of time caring for or around these beings and believe that they have got to 'know' the lived experience through observing them.

We have also gathered insights from our own observations and secondary research. We then perform a design synthesis phase where we collect together these insights in order to create prosthetics that can potentially map onto the human body.

We then build prosthetics in order to pinpoint key aspects of each kingdom, questioning: what is the central aspect of how this kingdom exchanges or communicates or senses? Choosing one aspect, we explore how that can be experienced on the human body.

We then test these prosthetics. From the testing phase, we then reflect and iterate the prototypes. Finally, we discuss our findings back with the experts in order to maximise the benefits of the iteration process.

The purpose of the prototypes is to produce a physical manifestation of the research. Some prosthetics become science communication tools or at least manifestations of a philosophical idea, when we can only make something that allows us to imagine the other world of the creature. Part of our research is playing with this line between science and philosophy. This is a way to tangibly explore what more we can know about these worlds through prosthetics and our limited senses.

METHODOLOGY

Our methodology consists of the following component parts:

- **Interviews:** We gathered a group of Umwelt experts, including: Jay Cousins, Sue Thomas and David Satori.
- **Literature review:** A literature review of existing Umwelt Hacking attempts was conducted including the work of David Abrams – *Becoming Animal* (Abrams, 2011), Charles Foster – *Being a Beast*, where he lives as a badger, a deer, an otter, an urban fox and attempts even to become a swift (Foster, 2016), *Marshmallow Laser Feast's: In the Eyes of the Animal*, which is an artistic interpretation of the sensory perspectives of three British species (2017).
- **Design synthesis:** Bringing together insights gathered from research and observations of Forests, mycelium and octopus to design prototypes.
- **Design matrix's:** Mapping out insights together to find similarities and differences.
- **Kingdom centred design:** Considering our designs from that kingdom's perspective: What is important to that kingdom, what are the kingdom's struggles and joys. Mapping out the wider reality of the Create prototype prosthetics to experiment with finding ways of sensing more like the Forest / mycelium or octopus.
- **Testing:** Test prosthetics with a variety of users (including the neurodiverse).

It is important for us to hack and test with a variety of people as there is no one way to experience 'like a different kingdom'. As we value neurodiversity, we value that everyone has different sensory needs. We value alternative perspectives.

- **Iterative design:** Iterative cycle of user testing, reflecting on experience and creating new prototypes.

PLAY AND AMBIGUOUS GOALS

During our sessions we take into consideration the core insights gathered and use them as a theme (e.g. = octopus are very tactile, so tactility becomes a theme of exploration) but we allow play to be the method in which that theme is explored. By having ambiguous goals, we can be open to more radical outcomes.

DESIGN PROVOCATION

Design provocation involves using prototypes, visuals and concepts to stimulate discussion. This is not about validating final concepts but about provoking new insights and sparking new conversations. In a workshop context it also allows for different thinking styles to engage with content in a new way which can open up new ideas and discussions.

SAMPLE QUESTIONS FOR GUIDING OUR DISCUSSIONS WITH THE UMWELT EXPERTS

- When a slime mould does a maze, how does it make those decisions?
 - What can trees sense? (we assume they know where water is, and where light is, is there something else?)
 - Do trees sense each other?
 - Do trees sense through their roots?

- Do trees have other senses?
- Is it always an individual tree, or can a group of trees sense as one?
 - Can trees communicate? (this can be in an abstract way, separate from how we consider communication)
 - Are trees intelligent? (can be in an alternative way from what we consider human intelligence)
 - Mycelium and Octopus' – Same questions, but we are also interested in knowing when it is one organism or a group – or are the individual and a group the same thing?

THE OCTOPUS

One of the most interesting things we discovered is that they are the only creatures to develop a radically different brain from our own. Octopus have a central brain, and a brain in each tentacle. This means they have top down and localised control. So, they tell each tentacle to do something, but also watch it go. Each tentacle also has chemical control; it emits a chemical that repels their other tentacles to avoid tangling. Their skin can also feel, taste, sense light and change colour (Figure 1). This research made us realise that sensation and tactility is paramount to an octopus, which led to the design of the whisker's prosthesis.

The octopus's brain and nervous system is a very unique expression of evolution. All other creatures who we consider intelligent, and have a complex brain are very close on the evolutionary tree, where our closest ancestors to an octopus are a tiny flat worm.

Camouflage is also a big theme. They are so aware of the colours and textures in their environment that they can, for example, easily become a piece of seaweed. Mischief and craft

are another big theme. There are tons of examples of octopus mischief. Also creating their own tools for hiding.

Another thing that is interesting to consider is why they are not more intelligent. One thing to take into account is that the octopus cannot exactly reflect on how they change. Humans improve their speech by hearing what they say and reflecting on what their plan was. We believe that an octopus doesn't have the ability to do this. They do not grow very old, which also stops them from developing more. They do learn from others, but they are often solo creatures with no parents.

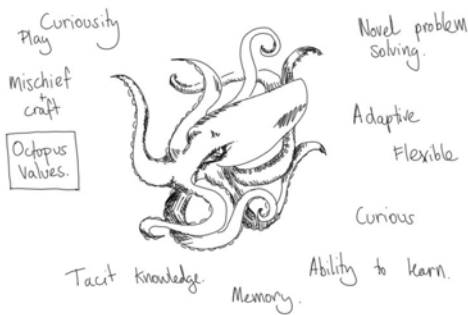


Figure 1.
Parameters of octopus intelligence.

INTERVIEWS WITH UMWELT EXPERTS

David Satori I think that feeling what it's like to be a tree or a fungus actually requires us to first learn to feel more human by conscientiously putting ourselves in our natural evolutionary context (nature). When we learn about cultures across the world that live a lot closer to nature, we see an extraordinary capacity to empathise and 'know' what it means to be other creatures, and that's especially true of people who hunt for a living.

That's why the art of tracking is now starting to become a popular practice in bushcraft and mindfulness courses. When you can read nature and decipher the stories of why things

look the way they do, you can slip into the memory trace of the animals that left the tracks. The same is true for intuitive herbalists, and probably true for indigenous mycologists (but I've never heard of such a person!).

It's like becoming familiar with a friend – you have to spend a lot of time with them to 'really' know who they are, and it could take years before you know the developmental situations that shaped them to be who they are, and only then you can put yourself in their shoes.

I think we really need to spend more time with organisms that aren't just humans, and more time in the woods just thinking about the lives of all the plants and fungi around you. I spent some time in the Yorkshire Moors when I came across a St George's mushroom growing from the root system of an old oak. At once it reminded me of my childhood when I'd go searching for mushrooms and the feelings that brought up in me when I found them. So I sat next to it and just observed it and imagined all the complex nutrient exchange that are happening between the mushroom's mycelium and the root tips of the tree, what it feels like to have a thirst for glucose, nitrogen, phosphorus, water, and after a few minutes I was like 'ah, I get it'.

But that aha moment quickly disappears once you're back at home. Our nature-disconnected society makes us feel like we're unable to understand trees or fungi, but just like an unused muscle withers away, our senses do too if we don't train them. Technologies can be really useful for bringing us closer to nature (like, a thermos is an amazing tool for helping me to stay outside for longer in the winter), but we can only use it if we have a good foundational nature connection, otherwise prosthetics can risk alienating us even more.

Sue Thomas David Abrams wrote: "A genuinely ecological approach does not work to attain a mentally envisioned future,

but strives to enter, ever more deeply, into the sensorial present” (Abram, 2011).

I’m not sure how far I agree with the first part, but the second part certainly strikes a chord because, sadly, this is often what I do not do when I’m in nature. I still find it hard just to ‘be’ without slipping into intellectualising, and in terms of the question of this paper, I wonder whether any deliberate attempt to sense like a Forest or Mycelium network is doomed to failure simply because it is deliberate and therefore the antithesis of the purpose.

Of course, we don’t know how ‘deliberate’ a tree’s life might be, if at all. I live near the New Forest and often go there, but David Abram’s observation has made me realise that I spend too much time being active there and not enough time simply standing or sitting still quietly while what is above and below me goes about its business.

UMWELT PROSTHETICS

We explored ways of amplifying the sensation of the skin. We imagined that by giving our human body parts amplified tactility and more sensation through whiskers each arm becomes more kinaesthetically intelligent, sentient, and curious and can experience the world more like an octopus.

WIND WHISKERS

These leaf-like whiskers augment the body with whiskers that move and pull at the skin with the movement of the wind. This allows the wearer to have a new experience of sensing the wind and allows observers to see the flow of wind around them.



Figure 2.

Whisker whiskers.

WHISKER WHISKERS

This suit gives the body amplified tactility and sensation through whiskers. This experiment is about becoming more somatic and valuing the kinaesthetic understanding of the forest. By giving our human body parts amplified tactility and more sensation through whiskers, it suggests ways that humans may become more kinaesthetically intelligent, sentient, and curious. It considers ways we can manipulate and rewire our sense of spatial navigation by amplifying what our skin feels.

Our favourite hack was someone who connected all the whiskers together to make the sensation travel up her body; as she played with a whisker on her hand, she would feel it up her arm:

- I had to really focus, creating quite a mindful experience. I found myself rediscovering common objects in a new way. Felt like a whole new sensation.
- I noticed textures on things I had never noticed before, the whiskers heighten my sense of when something was near.
- The whiskers could illustrate to an audience what I'm sensing and feeling, and how I am perceiving my space.

- It forced me to make time for exploring how my body felt. A mindful time where I felt new sensations.

UMWELT HACKING FRAMEWORK

Another part of the research is to create an Umwelt Hacking Framework where we generate guidelines for other Umwelt hackers which they can then apply to their own investigations. A sample of these guidelines include:

- Observe what are the forests paying attention to – what are the fungi paying attention to?;
- Sit and observe and imagine all the complex nutrient exchanges (engage the imagination – like an unused muscle it withers away, our senses do too if we don't train and activate them);
- Mushrooms can't move and neither can trees – maybe we need to bury ourselves?;
- Use prosthetics to disable the human (so you can't pick up your phone, disable time).

We can only achieve Umwelt hacking if we have a good foundational nature connection; otherwise, prosthetics can risk alienating us even more. I try and use my hands before the spade. We have a different awareness of fibre when we have to rip, tear, chomp and chew. So, perhaps it's about tool reduction before augmentation.

Jay Cousins

When you can read nature and decipher the stories of why things look the way they do, you can slip into the memory trace of the animals that left the tracks. The same is true for intuitive herbalists, and probably true for indigenous mycologists.

David Satori





Figure 3.
Wind whiskers.



Figure 4.
Neurodiverse creativity revealed whilst applying the Whiskers.

FUTURE WORK

We are designing our next round of prosthetics. First, we are considering mapping onto the body the response plants have to being nibbled. Some plants will actually send a chemical signal through their leaves to make themselves toxic; this signal can also be passed on to other plants. This prosthetic (Figure 5) will see two to eight people wearing gloves with long extended fingers which will connect to the next person. Signals will be passed from person to person along the gloves by light, sound or vibration.

Another prosthetic (Figure 6) considers what it would be like to be a tree within the mycelium network. In this design each person would put their hand into a ground embedded prosthetic.

When both people have their hand inside the prosthetic it will simulate a mycelium network by sending and receiving signals potentially in the form of vibrations. We will experiment sending different sorts of signals through the prosthetic to represent different nutrients. The research and testing will reveal what signals we end up using.

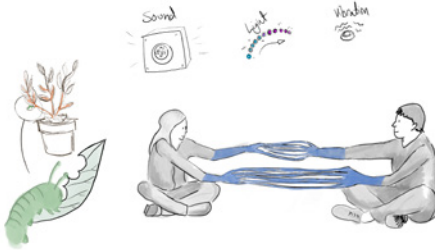


Figure 5.
Future prosthetic design based on plant responding to danger.

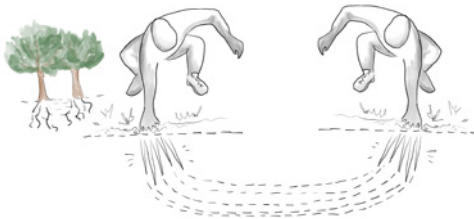


Figure 6.
Future prosthetic design based on experiencing being a forest in a mycelium network.

SUMMARY

We understand that we cannot claim through our prosthetics that we are sensing ‘like them’, but we hope we are one step closer to sensing a new form of intelligence.

In future iterations we will focus on considering the human at different scales, e.g., one human being as one fungus, or a group of human beings as a whole mycelium network. We would like to consider what it would be like to be one cell in the human body.

We are also considering what prosthetics we can give to plants, animals and fungus. Can a forest sense like an octopus or a human? Can an octopus sense like a forest? The process we have developed can be repeated and be applied between any kingdom.

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DOUBLE GAZE: INTERVIEW WITH JEREMY NARBY

Guto Nóbrega
(interviewer)

Guto Nóbrega Nowadays one hears about the intelligence of plants, or, in general, of nature, just as we also hear about teaching plants (Maestro plants). Are we talking about the same thing? Or are there two different points of view; the first investigated by science and the other by spirituality?

Jeremy Narby In my opinion, we are talking about using two knowledge systems. When someone uses two systems of knowledge and tries to go from one system to another, to go back and forth, it is extremely important to pay attention to each word because the words do not necessarily mean the same thing on one side and on the other. Knowledge systems have, let's say, different rules, like two different planets, with different gravitations, so that "walking" doesn't mean the same thing on Earth and on the Moon, for example. So, it is true that science is one of the knowledge systems. The other I call, for simplicity, "indigenous knowledge", "the knowledge of the indigenous peoples of the Amazon" (clearly, this is a generalization, but we can understand it), to use another word than "shamanism". I don't use the word "spirituality", either, and I'll tell you why later. But to begin, let's start with the first part.

So, thirty or forty years ago, in science, there was no talk about the intelligence of plants. There are even scientists right now who do not like the word "intelligence" to talk about plants; some do, some do not. It is important to say why: "intelligence" is a European concept, a word of Latin origin ("interlegere"), [meaning] "to choose between" and has been thought of by Western thinkers as a human specificity. It has been thought since at least three hundred years of philosophy and science that only human beings have intelligence, and therefore there has been much struggle to define this human specificity – our treasure, one of our treasures. So there are something like seventy definitions of "intelligence", almost all in uniquely human terms. It is a concept that is very difficult to use for

other species, and especially for species that do not have a brain, such as plants and single-celled organisms. So far, there are scientists who, when talking about the intelligence of plants, do not like it; they resist the term. They say intelligence without a brain is not possible. The truth is that we have problems with our concepts. Our concepts are not very intelligent, really. So, to speak of the intelligence of plants, science still has some resistance for the reason I have just stated. In addition, when talking with the Amazonian peoples, they say with confidence that there are clearly intelligent plants. They say that, just like people, some plants are very talkative, some are teachers. If you talk about teacher plants to a scientist, the vast majority will tell you that this is not a scientific concept. We can imagine that a plant has an intelligence, but we would have to debate what that means. However, to consider that a plant can be a teacher and that it can give us teachings, would be the equivalent of making an anthropocentric, or rather an anthropomorphic projection about plants. So, at this point, the indigenous concept of a teacher plant is not acceptable in the knowledge system of science. I say this at the same time that I have just finished writing about tobacco, a small book co-authored with a Peruvian Amazon connoisseur. So you see, we have been looking at what the indigenous people say about tobacco – which is a teacher plant – and what the scientists say about tobacco – talking about nicotine, etc. On the science side, it is now clear that, for example, nicotine increases concentration, increases learning, increases memory, so that this substance acts as a cognitive enhancer. This is published by scientists. As a translating anthropologist, I say: well, the scientists will say that nicotine increases cognition; the indigenous people say that the teacher plant teaches you things. These are not such distant conceptions. It seems that there is a significant limitation, where the concept of a teacher plant is too animistic for scientists, and it's certainly too animistic for them.

And they don't want to get into the sphere of religion, so there is this limitation. They say that when they consume tobacco, they consume nicotine, and nicotine increases their cognition. This is why I said that we must pay attention to every word of what we are talking about, recognizing the limits of knowledge systems.

Well, that's a long answer to a complex question. I compare it to speaking two languages, learning bilingualism. It is to say that sometimes it can translate, but sometimes there is no equivalence of concepts. Translators will often tell you that translations are betrayals. You have to betray to translate properly, so translating is never easy. It is possible, in many cases; sometimes it is not possible. Each language has its advantages and disadvantages. There are things you can say in one language that are very difficult to say in another, and vice versa. However, by practicing going back and forth between the two for a long time, one can gradually achieve something close to bilingualism. So it is important not to speak both languages at the same time. In this case, we are not talking about languages, but knowledge systems. We are talking about bicognitivism. In my opinion, you are talking about two points of view. In soccer, for example, there is one main angle that films the game and then there is another angle, to see it from another perspective. You see the same thing, but you see things that were not seen on the other side. It is interesting to have at one's disposal two, shall we say, opposing, complementary points of view. Science, in order to know, evacuates the subject and wants to treat everything as an object. A plant, for example, is a collection of molecules, and that conception is enough. Although we now know that plants perceive, learn, have memory, make decisions. Plants do all this, as we know, but science continues to treat plants as a collection of molecules, and this is what doing science is all about. In shamanism and in the knowledge of Amazonian people, one knows and treats the world as subjects. It is very complementary. Plants and animals

are like people, and we learn to know them by treating them like people. So there are really two very complementary angles and, in my opinion, you don't have to mix everything at the same time. We will have to see: one angle says this, another angle says that. I use the example of myself as a person: I am an object, a bag of molecules, filled with blood; if I cut my skin liquid shoots out. But I am also a person – or at least I have the impression of being a person. It is possible to be an object and a subject at the same time. To know the whole well, it is necessary to know the object and the subject. So we have to, in my opinion, take science into consideration. It is important to know the objective aspect of things, just as it is also important to be able to consider another point of view. It is like a person being bilingual, having more concepts to think about the world. [It is like] When you reach the limit of your language and there is no certain concept in your language, but you know that in another language there is such a concept and you can handle that concept because you know how to handle the language. So you have more concepts, more perspectives, more tools to understand the world. This is the idea.

To finish the answer, the reason I have resistance to the notion of spirituality is only because I take words seriously. “Spiritus” is a Latin word meaning breath, in the sense of “breath of God”. This is its origin. “Spirit” would be “the breath of God” that makes us different from others, biblically. The definition of “spirit” in the dictionaries is precisely that of an immaterial principle. That is the definition. Like breathing, it is immaterial. If one goes to the Amazon and speaks with Ashaninka people, for example, with whom I have lived, they do not talk about something immaterial. They say that inside every species, plant, animal, there are invisible beings, which they call maninkari, which in their language means “those who are hidden”. It means “those who are normally invisible”. You can see these entities by taking ayahuasca or tobacco. They are invisible most of the

time, but once in a while you can see them. However, they are not immaterial. Most of the time they are animating organisms, and when they are gone from the organisms, the organisms die. So the vast majority of the time, the maninkari, the invisible beings that animate living beings, are an integral part of their constitution. It is not something so immaterial. There is a dichotomy between the invisible and the visible, but not between the immaterial and the material. So, when we Westerners use the word “spirit” or the word “spirituality” – even worse, a greater abstraction – to talk about the knowledge systems of Amazonian people, we are imposing an immateriality that does not exist. In my opinion, the word “spirituality” is a source of confusion, so I try to avoid this word most of the time because it can lead us into confusion. In the book *The Falling Sky*, by Davi Kopenawa, the Xapiripë are spoken of, but the word “spirit” is not used by the author, as it is understood that this is a European concept, which does not really correspond to the indigenous concept. Precisely, it is because it is of utmost importance to observe every word we use. We think we know what “nature” means, for example, that we are friends of “nature”. But “nature” is also one of those Western words opposed to culture. So, “nature” means in dictionaries “everything that is not human”. There is an opposition among many Western concepts between human and non-human, and there, with “nature” and “culture”, we are totally in it. If you go to the Amazon and ask “what is your concept for everything that is not human?”, there will be no such concept. They will say that everything is human, that all plants and animals are people. So the words “nature” or “spirituality” – even though they are beautiful words and we are in favor of these things – have their baggage, their “dirty laundry” that is inside the word itself. We have to analyze, to open each “suitcase” from the inside. When we are going back and forth between the two knowledge systems, we have to go carefully and observe things well.

GN If different, would there be a way to reconcile them?

JN In my opinion, it is more of a translation. Because, for example, reconciling the Portuguese language and the English language makes no sense, we are not going to reconcile them. We speak Portuguese, we speak English, and then we try to translate. As I said before, translation is a dangerous, difficult art. When we talk to professional translators, they say that if we translate word for word, it often sounds strange. In the English language, for example, it is classic when you try to translate from the French language literally and it sounds weird. So, to make it sound good in English, you have to deconstruct everything. For example: in English, the passive voice is not tolerated, verbs are active; in French, on the other hand, the passive voice is used a lot. So you have to change almost every sentence. French intellectuals who write are the ones who use the passive voice the most. But when you are a translator and you need to translate the text into English in intellectual language, it is a tremendous job, you have to reinvent every sentence. It is complex. With all the little details of the French vocabulary, you often don't know exactly what the author meant. In some situations, you have to turn to him to find out what he meant. So it's not about a reconciliation of knowledge systems. We can suddenly talk about translation or even understand how two points of view can be complementary. As said, science knows the world by objectifying it, and indigenous knowledge knows the world by subjectifying it. Both are complementary, but different. It's not about reconciliation, but about learning to open your mind to understand that only objectifying, or only subjectifying, would mean collecting less data and consequently getting less understanding. If you succeed in opening your mind to understand that there are two points of view and that neither has a monopoly on the truth (including that it is possible to have greater understanding if you know

how to combine them), in this sense a reconciliation could be talked about. So far, scientific Western knowledge has thought of itself as having a monopoly on real knowledge. This is not the case with indigenous knowledge. The knowledge of indigenous peoples has always been open to other knowledge, but the idea that they are the only ones to obtain verifiable, reliable and real knowledge is very specific to Westerners. Therefore, it is the scientists who need to learn to open up to other ways of seeing. Reconciliation would be within their minds, since an Amazonian indigenous person already understands that Western knowledge has its value and is fully compatible. For him, there is no need for reconciliation.

GN Would a synthesis idea fit?

JN This would be a beautiful thing, but we are so far from a synthesis. We are like in the first years of school or the first years of university. We newly understand that it is all right with science, but there are limits, and that indigenous knowledge has value, even though, so far, many people in the western world do not know this. Recently, we are realizing that it is possible to go back and forth and that the two knowledge systems are talking about the same thing, but from a different angle. So what do we do with it? Well, in my opinion, it's all about going back and forth, and I try to do that in my work. Some of us start to give examples of how to use both systems of knowledge at the same time and, if we do that enough, in time we may, who knows, arrive at a synthesis. However, there is still a long way to go.

GN But I believe that it is a practice, a synthesis that goes through experience, and is not only intellectual. For example, I have just returned from this experience in Acre, in the Amazon, and I experienced a difficulty in finding a common language. Even though they speak a little Portuguese, there is great difficulty, especially when it comes to explaining certain concepts. I asked a question

about the issue of air, for example, the power of breath in shamanic practices, and had difficulty understanding the answer. Not for the words, but for the very idea. So the form of my understanding also came through the experience of ayahuasca itself, that is, the experience of the ceremony itself. So, it is a set of practices, ranging from experience, belief, faith, exchange, and the attempt to obtain an understanding through language, that led me to think about the idea of synthesis, because it is as if it were there to extract a common element, a juice, something that would be understandable in a broader way.

JN If I understand you correctly, what you are saying is that, according to your experience with indigenous people in Brazil, it was through your experience with ayahuasca that you began to understand some of their concepts.

GN Yes, I meant that I had language difficulty when asking a question, talking to a shaman, and I had approached him about very precise questions, for example, about breathing or about the breath, which is a very important and common component in shamanic practices, a healing instrument. I wanted to better understand where he came from and what exactly he did, but I couldn't understand the answer. Through the conversation alone, I couldn't understand, but I could get a clearer understanding in the context of the experience as a whole, which brings together the conversation I had with him, the experience of expansion through ayahuasca, and the context of living in the village. Perhaps it is from this place that I speak of synthesis as something integrative.

JN It is important, this case where there is a person like you and an Amazonian shaman. The scientist will be interested in universal questions, such as "what is breathing?" However, the indigenous people do not have a great interest in the universal, in

the meaning of breathing, for example. It's about your breathing. So, suddenly you didn't understand the shaman's answer, but he must not have understood your question either. So, to have a dialog, it is important to know the differences between the two knowledge systems. Another example: of the Amazonian shamans I know, many of them don't speak much. So it's not in the *logos*. In other places, there is singing, there is blowing, but there are not many words. We, on the other hand, are logocentric and we talk all the time, we conceptualize, we are looking for a common language every day. They are not in this place, they are in another place. So, when coming to them with questions in language about such universal things, clearly it will be difficult to reach an understanding. However, I think that for a college westerner to get out of the *logos*, ayahuasca is useful, to quiet his/her mind, shut his/her mouth, listen, feel, listen to his/her body, perceive his/her body, get out of his/her head and into his/her body – including through purging, etc. So it is a reconciliation between the head and the body, silencing the *logos*. Ayahuasca will shut you up in this sense, and it certainly opens you up to better understand the point of view of your indigenous interlocutor.

GN In your book *Intelligence in Nature* you say: "Scientists and shamans could join forces to try to understand the minds of birds and other animals..." We could perhaps also include plants in this group of investigated people. Can you talk a little bit about how you see this task force between the shaman and the scientist? How to reconcile the belief that nature is inanimate and the idea that plants can communicate with us?

JN Eduardo Viveiros de Castro gave an interesting part of the answer to the question concerning the collaboration between scientists and shamans. He wrote about taking indigenous knowledge seriously and, for him, this means not trying to explain it, to rationalize it... It's not about belief either, he puts

it clearly that we are not talking about belief, it's not about a theology. It is only a matter of suspending disbelief, of opening oneself to the possibility of what the indigenous people say, of understanding their truth. Viveiros de Castro said about the resonance in seeing oneself: we are not seeking to prove, to verify, to contradict, to believe, to only have on the side of the same ontological bias, but to be open to the idea that they know things that we do not know and vice versa. At least for a moment we can talk about what we know and then we can listen. And when we listen, we put disbelief aside and think like "well, suddenly it's possible" or "at least that's what they said". Recognize.

The example of tobacco is clear. It is a South American plant, the indigenous people have been working with it for thousands of years. It is a very important plant in the world, and when misused it has very negative impacts on health. The science of tobacco has a very complex history. We could very easily imagine a collaboration between scientists who know about tobacco, nicotine, etc. and indigenous experts who know about tobacco from their point of view. What can we say, what can we share, what hypotheses can we raise? So the scientists explain their ideas to the indigenous people and the indigenous people will say "well, suddenly our point of view will give the scientists ideas", and it would be like an exchange between two religions, an ecumenism. So a certain team has its way of seeing, but shares this place in agreement with another team, which we know has another way of seeing. But we imagine that others know things that we don't, and vice versa, and it is because we are in the place of excluding them, as always, that we agree to make the effort, we take the time to give them that microphone and really try to listen, even though it can be very difficult for a scientist to listen to an indigenous person talk about the teacher plant of tobacco, for example. "Teacher plant" would already be blocking the scientist's understanding. So all of a sudden it would take two translator anthropologists, as if

they were sports coaches giving massage, saying something like “brother, calm down; when you hear ‘teacher plant’, just think that for you it is a cognition enhancer. Even if the word sounds difficult to you, it’s not so far from the things you know well, so keep listening to your indigenous brother.”

GN What would be the word for the scientist, in the sense that he understands that tobacco would have the presence of an elemental, for example? Of a being that inhabits this tobacco, that for the natives this idea is extremely dear and that for them explains a number of things. Then maybe we fall into the blind spot you mention in the book. I don’t see how we can extirpate this *blind spot* to open this channel of conversation. I find it extremely difficult.

JN Yes, there is a *blind spot*. For example, do you know the Brazilian neuroscientist who works with the Kaxinawá, Eduardo Schenberg? He tells the story about trying to explain to the Kaxinawá why they study the brain, why scientists want to use equipment like EEG on shamans while they sing, etc., and they need to explain the science to the indigenous people. We want to study the brain and how it works while the natives say that the brain is the only part of the hunted animals that is not eaten; it is the only part they have no interest in. So, it is understood that the beautiful idea of making knowledge exchanges between science and shamanism is good, but when it comes to talking to the indigenous people – because we have a real collaboration – we have to do the research together and understand what we are going to study. Scientists are sure that they want to study the brain, and this means not only that there is a *blind spot*, but that it takes time for some to be understandable to others. This is a process of really doing a task force with leading scientists and shamans, bringing these two worlds together so they understand each other and collaborate. This alone is a tremendous amount of work, but it does not mean that it is impossible.

GN Interestingly, this is a work done in art as well, in the relationship between art and science. It is also a conversation and, amazingly enough, it is very difficult.

JN We'll get to the art later on. There was also the last question of the third question.

GN That's it. How to reconcile the belief that nature is inanimate and the idea that plants can communicate with us?

JN Well, the idea that nature is inanimate is a rather strange idea, because a plant, for example, is animate. The plant moves, grows, produces things, and according to the situation it is in, it produces different things. It's just that, generally speaking, plants don't move much, but they do produce substances, so they communicate. So they are like chemists. They produce chemicals in a spectacular way, and this is their specialty. So, okay, let's suppose that I am a scientist and my opinion is that plants are just a collection of substances, they are beings that don't do much, they produce these things and it is all a normal physicochemical phenomenon, including osmosis, etc. The plant, however, emits volatile substances or produces substances, and this is interesting about psychoactive plants, because these are substances that when we consume them in one way or another, activate our brain and enter the receptors and produce an effect. Then the pure hard scientist will say, "Well, it is a fluke that the plant produces nicotine and that nicotine enters our receptors. The plant is not trying to communicate anything, it is just by chance that these substances are there and have an effect on our neurons." Well, it is possible to believe that, and there are scientists who still believe that. That is one possible way to look at it. I also think that it is possible to imagine not so much with nicotine, because it seems to me that nicotine is an insecticide, a substance produced by tobacco plants to kill the insects that eat their leaves, and all this is more or less clear. However, the purpose of the cannabinoids in *cannabis* is not so clear – neither for the plant nor for the rest. It

is an unclear debate. How would it be in the case of hallucinogens, the DMT found in Chacruna, for example? It is possible to think that plants are producing substances with the goal of having an impact on the brains of mammals, because plants produce many different substances with different amounts and effects and use animals for pollination, for example. The plants are manipulating us all the time with this. So reconciling the idea that nature is just a collection of substances with the idea that plants communicate with others, to me, that's not so difficult. Plants communicate with chemical substances, but there is no certainty. I am not saying that we need to believe that ayahuasca is trying to communicate with us through harmaline, etc., but it seems clear to me that these alkaloids that psychoactive plants produce are produced to have effects on animals. So it would be a way to communicate with us, that's all.

GN As I had already mentioned in our previous e-mail contact, in my opinion, one of the greatest contributions of your book is to propose the use of an unfocused view (based on the model of stereograms) as an investigative methodology. As I understand it, this is an integrative methodology, in that it includes the peripheral gaze within the spectrum of knowledge. Science insists on the focus and the reductionist slicing of its objects in search of an absolute truth. Such an unfocused view seems to me to offer another way of dealing with reality, with the nature of flows. Could you elaborate on this topic?

JN The idea of the book *The Cosmic Serpent*, published 28 years ago, is still alive for me. I realized that I talked a lot about vision, because I was studying shamanism and ayahuasca and I started thinking: "What is seeing?" I have learned that, most of the time, the two eyes that we human beings have point to only one point. This is how our usual view works, so to speak. In the experiment with stereograms, you have to learn

precisely how to break the focal vision and see two distinct places, one with each eye. That was a metaphor at the level of method. As a person within the field of science, I was looking to understand what the Amazonian shamans were saying. So I started saying, “what if I try to let one eye see the scientific point of view and another eye see the shamanic point of view on the same thing?”; always observing the same thing, but in an unfocused way. So, instead of having only one point – either science or shamanism –, it is about seeing both fields at the same time, like a stereogram. It would be another metaphor for bicognitivism. The miracle of stereograms is that when you see them with your focused vision, you don’t see something clear, you don’t understand, the image is chaotic. However, when you defocus, the clear image appears and then you understand. And rightly so, combining at the same time the scientific vision and the indigenous vision, now we have it! For me, plants, animals, life, DNA, everything ended up making more sense when viewed this way, than just the mono-epistemological way.

GN Sometimes I mention a peripheral vision. It seems to me that it also enters the field of vision when one relaxes the eyeball and seeks a defocused view. Peripheral vision also comes in there as an element, correct?

JN If I understand your question about that correctly, there is a lack of focus when things are a bit peripheral and unfocused. Yes, that is part of the way: learning to live with what is not clear. That is, from the moment one agrees to leave the place of the certainty of science and enter into the idea that science has limits – that is, that there are other ways of understanding and, to have the possibility of understanding better, we need to learn to combine, then we have to learn from what is not clear or known, from mystery, at last. Having a greater tolerance for the peripheral, the unfocused. This is necessarily part of the approach.

GN In the stereogram there is a pattern relationship between background and figure that causes a three-dimensional stereoscopic image to emerge. In applying such a model as a way of generating knowledge, could we assume the images at the bottom of the leaf as scientific information and the hologram (figure) that emerges through an unfocused (shamanic) gaze a kind of expanded reality (*miração*)? It came to me that these patterns, because of their exactness, because of their rationality, they need to be arranged on the sheet in a certain way so that the hologram can emerge. So I compared these patterns with scientific knowledge and the unfocused gaze as being part of a method, as shamans do also in the sense of navigating these dimensions, of the trance. But now it is clearer, after your explanations and your point of view. If you want to add anything...

JN What I could add now is something that maybe I didn't say so clearly in *The Cosmic Serpent* book, because in the past it was more complex to talk about these things. I think it's not only about defocusing and having the two knowledge systems at the same time, but also, yes, defocusing at the level of taking ayahuasca. Having the experience of modified consciousness. One could also access this state through breathing, for example. But to combine, not only science and indigenous knowledge, but also the rational eye with the visionary eye. This can also be part of the program. It's not mandatory, nothing is mandatory. So a scientist who wants to open up to indigenous knowledge can take water and access, just open up, listen, dialogue, meditate. It is not necessary to take ayahuasca. However, it is an accelerant. I believe it's not for everyone and it's dangerous too.

GN It's not advice, of course.

JN Yes. How do you say, is it a *shortcut*? It's a path that helps speed up that access a little bit, if you will. So I think that

yes, when I am thinking about a complex problem, trying to understand what DNA is, for example, reading ten scientific books on the subject is good, and then taking ayahuasca and thinking about the same thing, is very good too. They both give you a lot to think about, and what's even more interesting is that after you've read ten books on DNA, and you do a session – let it be ayahuasca, or something else like that – and you think about it, this is very rich. If we are dealing with the DNA: what is this molecule? Is it a text? How does it work? With all the data that has been rationally integrated, you will also have the perspective of ayahuasca – or in my case, writing the book, I have been using the local fungi, such as psilocybin. The book was written by going back and forth between these two ways of thinking, but without saying it. Because, at that time, it was a guarantee to be disqualified directly. So the suggestion to use modified consciousness from time to time was between the lines in the book, but you are right to insist a bit on saying so.

GN Sure. I can even give a statement. I've always been very curious about the icaros, about the sounds, about this idea that the sounds are received through the ayahuasca process and transmitted by the plant. And recently I had an experience. It is curious how the ayahuasca experience is a gradual thing, it's not a single experience of a specific consecration, but it seems to deal over a very long timeline, which is as long as your will to know and to accept what comes from this experience. But I had this experience from this experience in the village, we brought many of the recordings of these icaros, these prayers, the Saites, and we opened the consecrations in a first moment with these sounds. And the connection is very strong with the forest. Of course, by a memory of sounds, but by the magic of sound itself with all the richness that you yourself have described in the book, of these higher frequencies,

of these modulations and of the temporal issue as well. A song always seems to last two hours, and in reality it has a few minutes there. But what I wanted to report is how my understanding and my perception of this teaching of sounds, within the ayahuasca experience, is completely different from the Western notion of this knowledge by rational, mental logic alone. It is amazing how it goes through an organic thing. I can't tell you what it is. It is as if knowledge comes from an extremely organic, biological connection. Sometimes I compare it to this way of the heart, which I mention a little later in the questions.

In practice, is suspending disbelief a way to activate the peripheral gaze, to include the out-of-focus? Would faith in things be an inverted focus? Believe to see?

JN We've been talking a little bit about that when you were talking about Viveiros de Castro. It was not a matter of really believing or not believing, but of stepping out of what belief is to listen. But I believe that believing is something very particular. It is certainly not a crime and, in my view, each person has the right to believe what he or she wants. Freedom of religion, freedom of belief. I want freedom. Well, I am agnostic, so I don't believe in much. At the same time, I know very well that it is impossible not to have beliefs. To have a point of view, at least some assumptions are necessary. So no one can claim to be without beliefs or without presuppositions. I believe it was Kant who said of the importance of distinguishing between knowing and believing. And, really, what has interested me all along is knowing, rather than believing. We talk about a plant. When I was a young anthropologist and the Ashaninkas talked about plants as people, I was incredulous and said "I don't think this is true." I didn't know why I was so sure that wasn't true. Yes, because it was part of my cultural assumptions, that's what I had learned in school, from my parents, from what everyone said. "If you think or

believe that plants are like people, then you are crazy,” I thought. But this is how the Ashaninka spoke. An anthropologist might have said “it is your belief”, but for the Ashaninka it was not a belief, it was an observation. For them, it was clear that plants perceive the world, have a point of view, are about living, reproducing, are similar to us despite differences and appearances. This was their point of view, just as the scientist’s point of view is that the plant is a collection of molecules. These are possible points of view. So the ideas of Amazonians, by and large, are very pragmatic. When they talk about the personality of tobacco, they say that it is a teacher plant and, behind the teacher plant, there is a mother, an owner, or, let’s say, a personality that is unique to the species. So there would be an owner of tobacco. This plant would have a personality. In my opinion, it is a possible way to think about tobacco. It is not so much really a belief, it is an experience that they have. They have long consumed this plant that has an impact on their personality, and they say “well, according to the way of knowing this plant, ingesting it and then visualizing its effect on the body and mind, one sees that the personality of tobacco is very strong, very masculine.” Many teacher plants are female. From the indigenous point of view, tobacco, for almost everyone, has a masculine, strong, dangerous personality, [a plant that] knows many things, which can also be a danger because it can lead to complicated places. It has such a strong personality that we need to respect it and be afraid if we want to work with it as an ally. That’s what they say. To me, this is not belief. Put all that in and say that “well, that’s their religion, those are their beliefs, they are animists.” For them, this is not religion. This is what they know about the plant. Then again, there is something very funny about the word “animism”. We understand what it means, we say “Amazonian indigenous people have animistic concepts.” But animists themselves do not say “I am an animist.” They don’t even know what animism

is. They say that plants and animals are like people. That is their point of view. It is not a religion. It is not a spirituality. It is a way of seeing the concrete world in which we live.

If we have to believe sometimes to see things... I have suggested in my book that it is not only “see to believe”, but “believe to see”. This would be to say that if you believe things are impossible, then it will be very difficult to see these things. So when I say that sometimes you have to believe in order to see, you have to become aware of your unbelief, go beyond it and think that suddenly it might be possible that these things exist. And only then it will be possible for you to see these things. However, in this conversation it is important to pay attention to every word. The terms “believe” and “belief” are words that need at least ten minutes to unpack to understand what we are talking about.

GN Right. I also included the word “faith”.

JN Even worse (laughs).

GN At the end of the book you make it clear that your inspiration for conducting your investigation through the balance between a focused and unfocused state of consciousness comes from shamanic inspiration. However, you reveal that shamans are not the only ones who seek knowledge through an unfocused gaze, but that artists likewise conduct their creative processes through this same practice. In art history texts much is said about the idea of the artist as a shaman. Could you elaborate a bit more on this correlation? Is intuition a tool of access for both the artist and the shaman? Is this the way of the heart?

JN It is also interesting to see that, in the Western world, knowledge is fragmented. There are specializations, then, there are biologists, psychologists, botanists, astronomers... Each one has their piece and it is difficult to go from one piece to another, and all of this is, let’s say, academic scientific knowledge. Within the humanities there is anthropology, history. There is pure and

hard science, there are sciences that are harder than others... And then, outside of the more or less verifiable knowledge of the academy, including anthropology, there is art. However, art is almost like the last piece left in the Western world destined for what is not knowledge, not science, not history, etc. And, finally, artists could indeed deal with themes such as beauty, love, the invisible... So, we say that shamans are experts of the unseen as a way of weaving a dialogue. Paul Klee, Swiss artist, said that the artist's role is not to represent the visible, it is to make visible. The work of art is to make visible the things that are not visible. This is Paul Klee's point of view. To me, a minority of artists do this. So, in this sense, artists are getting a bit closer to shamans. Shamans are not making visible the invisible, but they are contacting a world that we don't see much and communicating, gathering information, etc. Their job is not to make visible. They are not producing objects to make the invisible world visible, although they may sometimes do so. But this is not central to shamanism. Shamanism is a dialogue with the forces of nature for a conversation, to learn how to heal and what one wants to learn. It is, therefore, a source of knowledge. Shamans are from a world where the only specialization was shamanism. In the classical indigenous world, everybody could farm, build houses, heal with plants... There wasn't this fragmentation of abilities, except for shaman, which was a specialization, which would need to be learned, it wasn't for everybody. The artist is the fragment that remains once the rational, monotheistic world had finished cutting all the pieces: religion, science, etc. Finally, there is art and the artist. So, artist is a very Western and modern concept, let's say, to use words for this dialogue. On the one hand, among Amazonian people, everyone is an artist. Everybody is producing clothes, with designs, designing things. But if everybody is an artist, nobody is an artist. So there is no such specialization of the artist. To me, comparing artist and

shaman would be comparing a fruit and a car. They are different things. Within the specialization of the artist, there are very few who really work with the invisible, as shamans do. So I would be very cautious in comparing both. Intuition yes, you are right, it is something they share at the work level. It might interest you when talking to the Ashaninka about the concepts of body and mind. The Ashaninka concept is that a person has all his or her skin standing. To say “body” in Ashaninka you need four words: “all my skin standing.” And when you say “mind”, it is the same word for heart, which is “ishire”. So you have the outside of the person, which is the skin, and you have the inside, which is the heart. These are the words they use. They make no opposition between body and mind, between physical and immaterial. What makes a person think is this [points to the heart]. And again, the brain doesn’t interest them much. So, yes, I believe that we need to question our concepts. For example, the concept of body is quite strange and so is the concept of mind, because the mind is the whole person minus the body and the body is the whole person minus the mind. These are more or less the definitions. However, a body totally separated from its nerves – which are ultimately centered in a brain, which we know very well is connected to the mind – does not exist. It is to say that the brain itself is not limited to this, but goes through the body completely. So a body without a mind is a fiction. According to what we know, a mind totally without a body is also to be questioned. António Damásio has written about this: people who have “locked-in syndrome” and no longer perceive their body. Parts of their minds are missing, as they have difficulty feeling their emotions. So the body serves as the theater of emotional realization. Because if you don’t have access to your body, you have less mind. So the mindless body and the mind without body are creations of the mind and do not exist in reality.

GN But this connection with the heart, this Ashaninka perspective is very interesting, because we forget a little bit this integral perception of the body and, especially, the sensations of the body through the heart, this thing of "feeling". And perhaps also the idea that rationalizing is as if you were working a layer outside this immediate phenomenon of sensations, as if we were sometimes ignoring this "feeling", which is related to Maturana when talking about the issue of experience. It is an organic thing.

In shamanic stories, it is common to see comments about the path of the heart, as this being the main instrument of knowledge. Shamanic sounds, also known as "icaros", are received and chanted through the heart. The hegemony of the brain as the creative source and retainer of knowledge seems to lose its force in the realm of plant enchantment. Is this a paradigm shift that we need to absorb and develop in the search for an integrative knowledge?

JN Well, suddenly the answer is yes; I don't know if it's the paradigm shift we need, but I think that, so far, science has not understood music very well, and I think that shamans have picked up something interesting. Anthropologist Peter Gow has written about the shamanism of the Piros in the Peruvian Amazon. According to their explanation of the icaros, the Piro ayahuasqueros say that the powerful invisible beings that we perceive in our visions and that animate the different forms of life, in the end correspond to melodies. So the essences that animate plants and animals are a vibration or a melody. So from their point of view, the essence of the essence of life is melody. The shaman's job is to listen and sing with these potent beings. By singing their melodies with them, the shaman learns to see from their point of view. And from there it is dangerous, because they see it the same way as a potent being and that can be dangerous to normal humans. It is to say that from the moment you know an

icaro of a potent being, it gives you the knowledge and the power of this potent being. But well, he said that these potent beings are songs and are made of knowledge, and he also said that this can only be understood in the consciousness of ayahuasca. So if you are sitting there, in normal consciousness, and you hear an icaro, you think it's beautiful, but nothing happens. But when you are in trance, in the ayahuasca vision, from then on these melodies serve you to see, to understand, and even to have power. Seeing, knowing, power. First you have to see, it leads you to knowledge, and then it has a power. And well, to me that's interesting to think about, and science doesn't say much about it all. There has not been much measurement of the vibrations of different life forms. Suddenly, it is the limit of what is measurable. Suddenly, we can perceive only with our modified consciousnesses.

GN The very phenomenon of biophotonics works entirely in this paradigm of vibrations. It is pure vibration, it is undulation. I was just going to add that my experience from that memory, I think it has an epigenetic relationship in the sense that there is an imprint, perhaps at the level of the DNA itself, of that memory. Everyone who consecrates ayahuasca... Since I started with my research and my own ayahuasca experience, it's always the same idea that there is a continuity, that medicine acts at the moment of consecration, but that there is a post-medicine. And it's very curious that, regardless of whether it's... For example, my first experience was in 2014, I didn't get the second one until 2015, it took a year. The third one took two years, because of the fear I had of everything involving ayahuasca, the fear of not understanding what was really happening. I have always been a very grounded person and ayahuasca took that ground away completely, and that completely freaked me out. But it was an experience within the Daime. It was only three or four years later, in 2018,

that I came into contact with the shamanic experience, and then it changed completely. Since then, I notice that there is a memory, through which, for example, even listening to certain icaros completely activates another state of consciousness, which is magical, even if you are not in medicine. So there is something there of an aftereffect that for psychology could be just a psychological effect, something that causes this by a kind of recognition, but I realize that it is something very coherent with the very history of the development of medicine and its body.

JN Yes, it is clear to me that there is something serious about shamanic music and their view of music. Now, science has even begun to study the bioacoustics of plants. Before, it was a forbidden subject, now they are starting to measure and study it, so we are witnessing the beginning of scientific studies related to this field. Precisely, we are not talking about beliefs, we are talking about very concrete things. It is to say that you are there, you have ingested a plant, someone else is singing melodies, enchanting you and generating an effect in your mind, in your body, in what you see. It can all be experienced, it can be remembered, and you take the melodies with you and they impact you... And all this is, shall we say, empirically verifiable by anyone. Meanwhile, in the western world, music has been understood as entertainment, as separate from serious knowledge, *a priori*. So this is a belief, a belief that music has nothing to say, that it can't heal or do really concrete and important things. No, it is only for enjoyment. However, now so we are understanding that this is an assumption, a belief that limits our ability to interrogate the world and suddenly understand what is going on at the vibrational level. So science is newly opening up and could dialogue with the shamans. Which melodies to open which heads and take which minds in which directions? There is an experience and wisdom in Amazonian shamans, they are

practitioners of navigating consciousness modified with melodies. So someone might say: a DJ does that too. With his/her sounds, a DJ can take people on a journey. But, by any chance, does a DJ cure people? Have we seen people with real illnesses coming out of the concert healed? We are still waiting. So Western music, including technological music, may go beyond entertainment, but it has not yet reached the level of really having an impact on illness. So it would be an interesting area of research. Collaboration of scientists, plants, diseases, shamans and musicians, the whole world, biophotons, vibrations...

GN It brought to mind the same question as the beginning of cinema, with this photonic question. It also seems that when it becomes entertainment, it goes the other way, it stops being a tool for scientific knowledge, through the question of light, of movement, and starts containing an entertainment component. I know some artists who go exactly into the pre-cinema to rescue a kind of phenomenon that is extremely potent and healing as well. In other words, it is interesting how sound and light are always working together in some way.

Regarding biophotonics and your hypothesis that mirages could find scientific support in the production of photons by DNA, could you elaborate on how this image production would take place? The wave-particle duality of photons is believed to align such photonic phenomena with the production of interference patterns, which could be decoded in the form of a laser hologram. However, in the consecration of ayahuasca we have not only mirages, which are accessed internally with our eyes closed, but also visions, in which the magical reality of the medicine visibly interposes itself on our ordinary reality. What is your hypothesis about the functioning of the photons emitted by DNA in the context of the shamanic vision? As Fritz-Albert

Popp surmised, consciousness could be an electromagnetic field made up of the sum of these emissions, but he himself assumed that our understanding of the neurological basis of consciousness is still very limited, not to mention that this view places consciousness in a degree of dependence on our organic apparatus. What is your vision?

JN For me, biophotons are still interesting. Even, since it has been 27 years since I wrote the book, they are at the limit of what can be measured. Furthermore, to measure the biophotons of a cell, one would have to open a cell, and that would kill it. So it is not only a very weak source, but it is very hard to measure and is on the borderline of what can be measured. For this reason, pure, hard, biological science has hesitations, and this is its idea: if you can't measure it, it doesn't really exist.

GN But wouldn't the measurements of Fritz Popp and Alexander Gurvich, in the 1920s, be enough? Because Popp's big insight was the coherent aspect of photonic emissions that totally changes perception.

JN I agree with you and Fritz-Albert Popp. However, I believe there is something else. There is a materialistic, molecular assumption in molecular biology, which is about waves. Although light is important. If plants could not "eat" light, then we would not be talking. Even our brain has its waves that are measurable, alpha waves, delta waves, etc. Despite all this, biology still has a tendency to exclude waves if they are not frankly easy to measure. And biophotonics, for a moment, have been marginalized, I don't know why, for a quarter of a century. Regretfully, but these things need time. We have made a lot of progress with plant intelligence, not much with biophotons. Suddenly, in the next twenty-five years, there will be a revolution. If you had told me that in a quarter of a century, plant intelligence would be very advanced by 2022, I would not have believed you. I would have thought that understanding

biophotons would have advanced, because they are measurable. But it was the opposite. I am not the best person to say why.

GN Got it. Actually, the question was just to try to understand what is your conception of this mechanism, because I have a hard time understanding the imagetic construction of the biophoton, because we can understand, for example, how you get an image from the retina, we have already studied this thing of the darkroom, this inversion, the reflection, the image, all this construction of vision. But, thinking about this photonic, internal emission, what apparatus or what system would produce these images? I was just curious to know if you had a conception of this mechanism. It is one thing for you to know that - OK, we agree that photonic emission exists. This was Popp's great work in the 70's, to be able to measure with photomultipliers, and the Japanese, with the recording of an image. But light transforming into signs, symbols, geometries, is another thing, isn't it? Which apparatus would produce this inside the body? What would this mechanism of constructing these intelligent images inside one's own body look like? And then I even brought up the issue of vision, because sometimes you have a modified vision of reality.

JN Well, the truth is, I don't know. The good answer to your question is: I don't know. Nor do I know where the images that we see when we are in *miraçãõ* come from. We have our eyes closed, there is no *input*, but we see the images with a lot of light, very strong, a lot of movement, denser with information than we normally see... Where it comes from is a great mystery. Very big mystery. But the biophoton hypothesis that is in the book *The Cosmic Serpent* remains possible for me. It has not been contradicted or falsified. Suddenly, someone will manage to falsify this idea. Or suddenly we will be accumulating things that go in that direction. At the moment, we are a bit far away from

knowing what goes on inside our heads, inside our neurons, at the DNA level, at the biophoton level, while taking ayahuasca; we are very far away. So, the mystery is great and I'm okay with that too. The questions are good, but the mystery is great.

GN In addition to the visions that one experiences through the consecration (ingestion) of ayahuasca, what one experiences intensely is an internal dialogue, as you also report in your book, through which we receive precise instructions on our issues, we verify our arrogance and total ignorance about a reality much more powerful than the ordinary one known to us. We become humble. In one of his numerous lectures Terence McKenna reveals to us that, beyond the psychedelic images promoted by the power medicines, the most important thing is that there is a "voice" that speaks our language and communicates with us. All of this happens to the sound of shamanic chants, also known as rezos, which call the strength of the forest through their modulations. This is magical and defies our rationality. In this sense, rather than seeking scientific reason in experiment, wouldn't it be more productive to inject magic into science?

JN The question is at the voice level, right? The voice that someone can hear. And I fully confirm it. Also, as I was telling you, I worked a lot with psilocybin fungi, more than ayahuasca, and it is known that psilocybin is more a voice than images. Ayahuasca is more visual; there are voices and sounds, of course, but it is very visual nonetheless. Fungi are more auditory and less visual, according to each person. I also believe in the idea that, like Socrates, there is your *daemon*, your inner voice, which advises you on things, that "this is it, not that, this way, that way"... And that this voice has more volume when the fungus or ayahuasca is ingested. So, is it about knowing how to listen to that voice? Yes. And what is that voice? I spend my time trying to listen to her, more than explain her. So it is very difficult to explain, but it

is something that everyone can cultivate. To listen to it, silence is useful. Going to the woods with trees is helpful. In a quiet place. The logocentric rational mind is always chattering. Go for a walk by the river and get it to quiet down. That's what I do.

GN Are you writing a book about cannabis? Do you have any forecasts?

JN It took 18 months to do the first half. Six chapters in 18 months, I have six more to go!

GN And you just wrote about tobacco?

JN Yes, it will be released in Brazil in October. It's called *Plantas mestras: tabaco e ayahuasca* [*Teacher Plants: Tobacco and Ayahuasca*].¹

GN More than 20 years after the release of *The Cosmic Serpent*, how do you perceive this moment of this return to neo-shamanic practices? Do you update your ideas in any way?

JN Well, there are many things. So when you say "neo-shamanic," there are many things there. There are people who do a good job, there are others who do whatever. It's an industrial, modern, Western world, call it what you will, that is returning a bit to finally taking shamanism seriously: okay. But it does so with a tendency to treat indigenous matters in a capitalist way. So there is good and less good. There is a greater respect for indigenous things and at the same time there are problematic things.

GN Excuse me, my question was not about an evaluation of these practices, but about this moment, this search, this necessity, in a certain way, of people searching for this knowledge in some way; then, of course, some people are taking advantage of this moment.

JN You ask why there are so many people seeking this?

1 NARBY, Jeremy; PIZURI, Rafael Chanchari (2022). *Plantas mestras: tabaco e ayahuasca*. Rio de Janeiro: Dantes.

GN Yeah, in that sense.

JN Then I think I have a possible answer. In the Western world, many cases are beyond monotheistic religion, beyond allopathic medicine. People end up having questions about their world, because materialism is not entirely satisfactory, religion is not convincing, our medicine is convincing to a certain extent and shopping has its limits. A comment others have made is: "A condition of the modern world is disenchantment." Max Weber talked about this. So, people are disenchanted with the modern world, but these moderns are going towards the indigenous people to seek to reconnect their minds with their bodies, reconnect with nature, seek other forms of healing, other ways of having a religion, a link with the world; then, looking for antidotes to the modern world and its limits, and ayahuasca and the Amazonian peoples with their rituals... Ayahuasca will connect your mind with your body, just take it and you will have a connection with your intestines very quickly. It will increase your perception of nature, and the Amazon is one of the most intense natures. So if you are seeking healing from the materialism and faithlessness in our world, then going to these specialists, who know intense rituals of transformation, [means] you are knocking on the right door. The Westerners who make the pilgrimage to go in search of healing, of new knowledge and all these reconnections... So yes, it makes sense... And for the natives too, it makes sense that the *gringos*, a bit sick, like vampires, have sucked all the matter out of the world for centuries. However, they are sick, they are white, they are always missing something. They extract and extract, but never get satisfaction, and in the end, their children come for the cure.

GN Would that something be the wisdom of nature, what it has to offer?

JN Yes. They are knocking on the right door, but this opens up a whole new field of complexity, clearly.

EDEN UMUTINA:
ETHICS -
DURABILITY
- ECOLOGY -
NATURE IN
AMAZONIA

EDEN Umutina, based on the notion of ancestrofuturismo¹ (2022), is a new stage of our EDEN project. It is developed within our participation on the project Terra como Princípio Educativo, promoted by UNEMAT, in collaboration with NANO (UFRJ).

EDEN (*Ethics – Durability – Ecology – Nature*) is a global art & science project by Olga Kisseleva, in progress since 2010. It was the rebirth of the Biscarosse Elm in the frame of Olga Kisseleva's *Biopresence* project (2010-2012) that served as a catalyst for the creation of a series of the tree-based bioart works created by the artist during the last decade. The “arboreal” theme was taken up and developed in several parallel studies. One such extensive project is EDEN *Ethics – Durability – Ecology – Nature*, which officially began in 2012 and has continued to the present day. The project touches on a range of issues, including the protection of endangered plant species and interspecific communication between living subjects that are placed in the “inhuman” category.

The EDEN project is aimed at creating a new Garden of Eden as the ultimate goal of introducing innovative technologies to art and using unorthodox thinking to solve ecological problems. In collaboration with scholars from various countries, EDEN is currently “resurrecting” the following plant species: the West European elm (the *Biopresence* project, France), the Afarsimon and Methuselah palm tree (the Negev Desert, Israel and Jordan), *Sophora Toromiro* (Easter Island), *Bodhi Jiulian*

1 The concept of “ancestrofuturismo” (“ancestors + futurism”) was introduced by Fabiane Borges and presented as main theme for the event *Hiperorgânicos 8* in 2018. The term is made up of two words that, according to the artist, constitute an apparent contradiction, because of the immiscibility and ambivalence of the two worlds that represent the archaic and the futuristic, respectively.

(China and India), Wollemi Pine (Australia), and the Apert apple cultivar (Kazakhstan). The study of trees as guardians of biological and historical memory has a special place in our project. We created in this field the Memory Garden program (2020) based on the biosphere of Babi Yar, one of the most tragic sites of the Holocaust. The memory captured through its trees, perceived as time capsules is a message about the future, despite the tragedies of the past.

Our artist team scrutinizes the hypotheses advanced by scientists, according to which plants can communicate among themselves. We are also investigating the possibility of “eavesdropping” on this arboreal “dialogue,” and even taking part in it. This idea has given birth to the project in which trees can “communicate” on two levels: among themselves in the T2T (Tree to Tree) model, and on the level of the global T2N (Tree to Network). The trees included into the project can talk together across continents, and humans can follow their communication through our art installations. This network helps trees to optimize their vital mechanisms and to protect themselves from potentials aggressors. The trees included in the project can talk to humans through the internet and let them know about any danger which can be perceived by vegetation before we know about it. EDEN experimented the first communication between the historical balm of Gilead trees in Israel and the similar trees in Jordan (*Listening to Trees Across the Jordan River*, the Negev Museum of Modern Art, 2020). Thanks to the T2T system, trees growing in natural conditions (Japanese cedars) and trees that have a different biological memory (Wollemi pine) establish contact through their relatives in Japan, and learn the anti-catastrophe scenario from them (Echigo Tsumari Contemporary Art Triennale, 2018).



Figures 1, 2 and 3.
Working in Umutina,
Mato Grosso, Brazil,
2022 (Julieta
Zurita, Lucinei
Corezomae, Edielson
Barreto Medrado,
Malu Fragoso, Olga
Kisseleva).



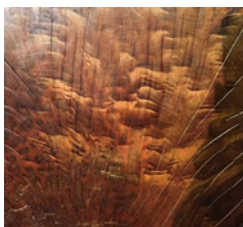
EDEN Umutina is the natural continuation of the *EDEN: Native and Migrants* project, we carried out in 2016-2020 on the territory of Brazil and India. This extensive project is the product of the artist's expeditions to the regions inhabited by Brazil's indigenous communities, especially the Nambikwara,

Manoki, Kayabi, Bororo, Bakairi Terena, Chiquitano, Umutina and Paresi, the latter organized by UNEMAT in the frame of the project Terra como Princípio Educativo. Other researchers from the concerned area were present for the event and shared their experience and their philosophy in the field of the relation nature-national culture. Especially the presence of the big Quechua poet Julieta Zurita was important. And Professor Malu Fragoso, from NANO UFRJ, made the efficient link between nature and digital technologies through numerous multimedia workshops.

During this expedition our team became familiar with the everyday life of a native South American of Umutina community, and began to wonder how they could transmit to us the ancient knowledge that the Native Brazilians have kept over the centuries. The *EDEN Umutina* project makes use of dialogue and artistic experiments to develop a toolkit that would be able to create the mechanisms for a structural convergence between the past and the future, in order to expand the perspective of the present. We payed particular attention to the relationship of the native peoples to the plant world, seeing in it a possible blueprint of new models for the “human-plant” relationship. During the workshops in Umutina we let young Native Brazilians to become familiarized with the workings of the devices we have created, and use the T2T/TNT technology for subsequent communication with the trees growing in the compact territory which they inhabit. In this way, we were able to compare the modern ways of communicating with trees – which are made possible by attaching sensors to their trunks – with the ancient ways of communication that had been handed down over the generations in the Native community.

EDEN Umutina creates discourses that call for urgent activities as a response to the problem at hand. In the contemporary public consciousness, the future is taken to be related to

the current epoch, which is usually conceptualized as leading humanity away from obscurantism, superstition, and various folk beliefs; and pushing it toward the triumph of science, knowledge, and technology. From this point of view, our ancestors seem to be the bearers of traditional, outdated values that prevail in archaic societies.



Figures 4, 5 and 6.
Olga Kisseleva.
EDEN Umutina,
fragment of work-
shop, Umutina,
Mato Grosso,
Brazil, 2022.

Our project disputes this approach. For her, the link between the past and the future is linear. Therefore, by rethinking our view of nature from the point of view of the biospheres, the cosmos, and the thin, invisible connections between the ancestral knowledge and the modern scientific “database”, she

facilitates a dialogue and mutual enrichment between the “old” and the “new” knowledge.

The *EDEN Umutina* project continues the investigation into the capabilities of the T2T/TNT system. In the territory where the local population still adheres to traditional medicine, continuing the ancient pharmacological tradition of using ingredients derived from plants and animals, the artist sets up a hybrid artistic workshop, mixing the T2T/TNT measurements on local trees with the sharing of local way of human-non-human communication. One of the project’s important attributes is its invocation of the Native Brazilian cultural and historical legacy, with the artist giving young Native people the ability to test the ancient knowledge with modern scientific methods.

Interestingly, the Umutina people have always been familiar with their native flora. Today, the Brazilian indigenous languages are the third most important source for botanical names (after Greek and Latin). Traditionally the indigenous people think that all entities, animate and inanimate alike, possess a soul. According to an ancient indigenous legend, the *yerba mate* plant – the source of the famous Brazilian beverage – has a soul. Native myths claim that this plant used to be a young girl. The Guaraní say: “Yerba mate is the essence, the soul of all Guaraní. And the Guaraní are the essence of the land on which Yerba grows” (Grigulevich, 1977, p. 295). This perception of plants and trees is akin to that held by the New Zealand Māori, who think that the trees are creatures equivalent to human beings, and who venerate the most ancient and majestic representatives of the plant kingdom.

The *EDEN Umutina* project stokes interest in studying the ancestral traditions of the native Brazilians. This, in turn, serves to create extensive opportunities for expanding the volume of tourism into the country’s wild regions. Thus, *EDEN Umutina*, like many of the artist’s other projects, serves an

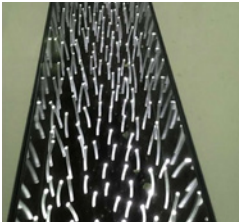
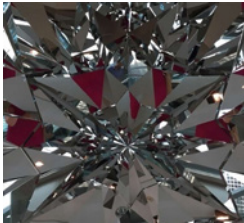
important social function. On one hand, it encourages the preservation of the ancient traditions; on the other hand, it uses the medium of art to draw attention to the region's contemporary problems. We hope the project helps to advance new scientific breakthroughs and traditional knowledge through the language of modern art.

One of the new works we are producing (work in progress) from the experience at Terra como Princípio Educativo is *Datascape Umutina*. It is an interactive program that materializes and analyzes the whole communication activity of the organic network based on vegetal medium across the selected geographical area. At the heart of this project is the dynamic database dedicated to regional trees and to the broader ties between vegetal heritage, climate, and society. This database will be the source of all visual displays seen by the public and it will also have an interactive dimension: as the project goes on, the public itself will be able to feed the database thanks to a specific QR code. In other words, the art piece will take the shape of a visual display installation composed of digital objects that it will visually map and connect to one another.

Its goal is reviving extinct species of plants and preventing the extinction of species that have been placed on the IUCN Red and Green lists. The real culmination of the *EDEN* project is our contribution to landscape restoration. It leads to reflect on the implication of humans in this communication and these processes and how to durably change the behaviors by setting up the realization of a true utopia within the concerned indigenous population.



Figures 7, 8 and 9.
O. Kisseleva. *EDEEN*
Umutina - instal-
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progress, 2022.



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PABLO AMARINGO
AND VISIONARY
ART IN THE
PERUVIAN AMAZON:
CHRONICLE OF A
COLLABORATION

Luis Eduardo Luna

A blast of hot, humid air hit my face as the plane door opened. Behind was the huge savannah of Bogota and the bustling airport of Lima. Now I was back in Pucallpa, on the banks of the Ucayali River in the Peruvian Amazon. As I entered the building with the other passengers to collect my suitcase, someone repeated my name in a low voice to everyone passing by. I identified myself. “Mr. Dennis is waiting for you.” It was already getting dark. The motorcycle taxi took me to a house preceded by a tree-lined courtyard where about twelve or fourteen people had gathered to drink ayahuasca, the drink prepared by cooking *Banisteriopsis caapi* (malpighiaceae), a normally cultivated vine that in its natural state can be enormous, and the leaves of *Psychotria viridis*, a rubiaceae, called “chacrana” in Peru (“chacrona” in Brazil). Dennis briefly introduced me to Don Fidel, the master vegetalista, who was already distributing the “patecitos” (small containers) with the drink. I didn’t have time to accustom my body to the jungle environment, and I was already ingesting the bitter ayahuasca all at once, not without apprehension.

It was the year 1985, in mid-July. Earlier that month I had organized in Bogota, within the 45th Congress of Americanists, a symposium that I entitled “Shamanism and the Use of Plants of the Genus *Banisteriopsis* and their Additives: An Interdisciplinary Approach”. There were speakers from eight countries, including Dennis McKenna, whom I met two years earlier in Vancouver, where he was working on his doctoral thesis on monoamine oxidase inhibitors in the Department of Botany at British Columbia University. At that time, his brother Terence McKenna was already becoming a celebrity, especially in California, after the release of his book *The Invisible Landscape*, co-authored with Dennis, and mainly for his hypnotic conversations in which he mixed ideas about shamanism, psychedelics, philosophy, alchemy and the possible End Times. I met Terence in 1971. We drank *yajé* together for the first

time, at Villa Gloria, a small property my parents owned near Florencia, my hometown, then just a small town located at the foot of the eastern mountain range and the beginning of the now largely deforested Amazon forest of Caquetá, Colombia. *Yajé* is the Tupi name given in the Colombian Amazon, and in contiguous territories in Brazil and Ecuador to a drink in which *Banisteriopsis caapi* is mixed with chagropanga leaves (*Diplopterys cabrerana*), another malpighiaceae.

I spent two and a half months with Terence and his partner Eve (not her real name) at Villa Gloria, during the day looking unsuccessfully for psychotropic mushrooms in the nearby meadows, and until late at night talking by candlelight, under the influence of a variety of especially powerful cannabis, which I was experiencing for the first time. Terence's influence was decisive for me to dedicate part of my life to studying the use of sacred plants by the indigenous and mixed-race population of the Amazon, whom the local population considers teachers from whom they can learn (Luna, 1983).

Dennis had already been to Pucallpa a few years before, where he briefly met Pablo Amaringo, who lived near Mercado Tres, in one of the poorest neighborhoods in the city. His wooden house, almost without furniture, was built, like some others in the neighborhood, on platforms, in a land that was almost always flooded. It had no electricity or running water. The bathroom was a makeshift shelter of old aluminum cans at the end of a boardwalk over the swamp. His mother lived in an elevated room next to the kitchen with no walls. There also lived his nephew Juan Vásquez Amaringo, still a teenager, son of a deceased brother. A little shy at first, Pablo soon began to excitedly tell us about some incidents from his busy life. He had been a logger, a barber, a fisherman, worked in the port of Pucallpa and, for a time, before photography ruined his business, he painted portraits. Pablo was self-taught in everything,

with a minimum of formal education. Concerned about spiritual matters, he attended various religious organizations and was very knowledgeable about the Bible. Then I realized that he also had access to some kind of esoteric literature. A year later, he told me that he had been a money ticket counterfeiter. At first he drew the banknotes one by one, then he used more sophisticated methods. He was arrested several times for this. On the run from the authorities, he lived among various indigenous groups, acquiring extensive knowledge of the flora, fauna and local Amazonian traditions. He had gotten used to sleeping every night in a different place and without changing his clothes, ready to flee if necessary. When I met him (he told me a year later) he was about to embark on another counterfeiting project again, with the help of a partner who would supply him with a special Japanese paper. I showed him a Finnish banknote from the time. He held it up to the light and told me, "Very easy. The water seal is made with avocado". He has thanked me many times over the years for giving him the opportunity to make a living solely from his art. Apparently the authorities in Lima were so impressed with the quality of the forgeries that on one occasion a curious officer came to visit him in prison to meet him in person. Probably some of these banknotes must have been preserved in an archive in Lima.

Pablo was then forty-seven years old, nine years older than me. What aroused greater interest in me was that he told me that he had been a *vegetalista*, a specialist in the use of ayahuasca, tobacco, *toé* (*Brugmansia* sp.) and other "master plants", but had abandoned this practice seven years ago. I noticed immediately that he had an extraordinary knowledge of this tradition.

At some point in the conversation, Pablo showed Dennis and me some small watercolors he had done on rough paper. They were jungle landscapes, or detailed scenes from the life of

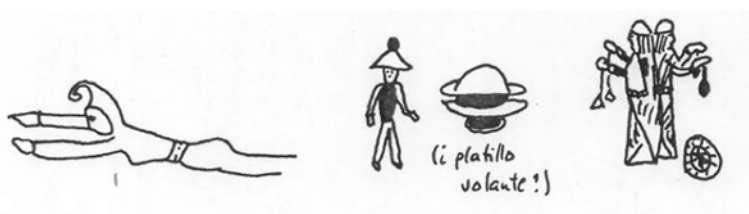
riverside dwellers, perfectly recognizable plants and animals. He explained to me that ayahuasca taught him to mix colors (he had his own chromatic classification) and to manage perspective. He remembered in detail what he had seen, that is, he had an extraordinary eidetic memory. I asked him if he also remembered the visions he had in his time as a vegetalista. He said yes, and that he would prepare some paintings for us. The afternoon ended with an impromptu party where Pablo brought his accordion, while his brother Fortunato, who lived nearby, joined in the party playing guitar.



Days later we went to see him. He willingly showed us his first two visions on black paper. He gave one to Dennis, the other to me. When I returned to Helsinki, where I was working as a professor in the Department of Modern Languages at the

Swedish School of Economics, I sent Pablo a letter that included the following paragraph:

Here I am sending you a photocopy of the photo of the ayahuasca visions you gave me. I'm full of curiosity about what the various numbers mean. Do you think you can return one of the photocopies with commentaries to me? For example, putting who's who and what some of the objects represent. I'm also very curious about some of the characters you drew in the painting you gave Dennis. Here's a primitive drawing of mine (I'm not an artist) so you'll remember what it's about: who are these characters?



He responded to me right away. Here are his words:

You ask me for explanations of the ayahuasca visions that the painting I gave you shows, then I will give them to you in order of numbers:

1. These represent warriors sent by a muraya, who is trying to ambush his victim, which is being healed in full concentration, in order to strike down the healer, if he is careless, but we see other warriors who go out to fight with shields and sabers; these are the powers that the doctor has at his disposal to neutralize any invasion that the enemy wants to make.
2. This is Lola Valuarte, the powerful queen with sublime magical powers, who manages a magical cage of great power to trap her enemies; she is an inhabitant of Venus.
3. They are princesses of enchantment and love that radiate waves of captivating music with lures of inescapable charm, whose dancers beat to the rhythm of sweet melodies; they are also from Venus.
4. This is a Venusian flying object from the planet Jupiter whose ships have a connection with the allpamurayas (people who walk through cavities inside the earth in their ships, similar to these).
5. This is the great Kin Kung of China, sublime for his esoteric remedies with mysterious plants.
6. This is the great king Sakya, whose great transformations are of too intricate knowledge to disappear instantly, for he is the genius of hypnotism.
7. The charming king Mizrain receives a powerful balm from a subject, in the lavish palace of Egyptian wisdom, with gifts for great alchemy.

About the four figures in the painting that Pablo gave to Dennis, he wrote the following:

1. This is the fairy Perunugá, she performs healing powers, secret discoveries and wars in favor of her own.
2. A great master from China called Ni, with gifts of the greatest oriental hyperchemistry, has dominion over his most audacious enemies with great wisdom.
3. A spaceship that transports beings from one place to another between galaxies and that is rarely seen.
4. Pilgrim kings of the universe with a Persian figure who travel at great speeds in deep echoes of sound, where they pose in a rainbow circle and give all kinds of wisdom instantly, be it the gift of tongues, inventions etc.; the circle that appears at the bottom of them represents the galaxies they visit.

I was stunned. Although Don Emilio, one of the vegetalista I worked with, had already told me about “doctors who come from India”, about machines he had seen in his visions, or about angels with swords defending the place where the purge is performed (Luna, 1986), this painting presented a complexity that surpassed what I could expect from an Amazonian vegetalista. That letter, written in elegant handwriting and perfect spelling, was the beginning of an almost ten-year collaboration that would transform Pablo’s life and, to some extent, mine as well.

I open a parenthesis here to write about an author who served as a guide in my collaboration with Pablo Amaringo. I am referring to the work of the Austro-Colombian archaeologist and ethnologist Gerardo Reichel-Dolmatoff (1912-1994), whom I visited twice at his home, in Bogotá. His book *Desana: Symbolism of the Tukano dos Vaupés Indigenous*, published in 1968 (translated into English by its author in 1971), written

with the collaboration of a single informant, was a milestone in the knowledge of cosmology and ethnic group thinking. Agustín Guzmán, a Desana native living in Bogotá, became interested in the anthropology course at the Universidad de los Andes, directed by Reichel-Dolmatoff. He had been a seminary student, had been in the army, spoke six indigenous languages in addition to Spanish, had learned phonetic transcription from missionaries at the Summer Linguistics Institute, and knew how to type and use a tape recorder. Although he had left his village many years ago, he was still interested in and in touch with his ethnic group.

Although Reichel-Dolmatoff briefly visited the Vaupés region and had contact with some indigenous people, he had not yet been in Desana territory. Upon meeting Agustín, he realized that there was an extraordinary opportunity for collaboration. He got him a position as a research assistant at the university, and for a period of six months, from one to three hours a day, he displayed pictures of the Vaupés animals in front of him, collecting information about their habits, relationships with other animals, and especially relevant cultural associations between some of them and the men and women of the community. With their help, he collected origin myths and organized the material, until the moment came when Agustín realized that the purpose of the project was a broad presentation of the Desana cosmogony. Thus he moved from being a passive informant answering questions to actively seeking meaning in the material he himself was developing.

The book made Reichel-Dolmatoff an international celebrity. Claude Lévi-Strauss even commented that “[...] from this work onwards, the ethnography of South America will never be the same, because you have made it enter a new era” (Laurière, 2010). This study showed what was possible to achieve by working with just one person who had extensive knowledge of

their culture. It was also the beginning of Reichel's increased interest in the lowlands of the Amazonian northwest jungle, since his previous work, together with his wife, also an anthropologist and archaeologist, Alicia Dussán de Reichel, had taken place in the Caribbean and Andean regions of Colombia. With Agustín he discovered for the first time the profoundly ecological thinking of Amazonian tribal societies. Reichel-Dolmatoff further noted the crucial role of caapi (*Banisteriopsis caapi*) and other visionary plants in the cosmology, shamanism and iconography of such societies. Agustín Guzmán's contribution was of such importance that it would have been appropriate for him to appear as a co-author of the book, but this practice was not common among anthropologists at the time.

Another book by Reichel-Dolmatoff greatly influenced me in planning my collaboration with Pablo Amaringo. In 1978, his large format book *Beyond the Milky Way: Hallucinatory Images of the Tukano Indigenous* appeared, already based on field work with a Tukano group from the Piraparaná River region, almost without any contact with Western civilization. Reichel discovered that all the graphic art of this culture is inspired by the images and colors that are seen in visions with yajé: the decoration of the walls of their houses, especially in the bark panels of a certain palm tree (*Socratea exorrhiza*) for the entrance of the malocas, ceramics, utilitarian objects, musical and ritual instruments, and body painting that the indigenous people applied before certain ceremonies. These motifs form a veritable code that is repeated in the decorative art of the Tukano, giving them a profound meaning. Only the men ingest the *yajé*, although the women participate in the rituals by singing and dancing. Reichel brought paper and colored pencils with him and asked the indigenous to paint what they saw when they drank *yajé*. The result was a series of complex and meaningful drawings. Reichel recorded their interpretation,

comparing the information between them, relating it to the Tukano cosmology he had collected. The book features forty-six paintings by eight indigenous people, accompanied by interpretive comments. Jean Langdon, who worked among the Siona of Putumayo, also of the Tukano linguistic family, reached similar conclusions: the narratives, the iconography on pottery and other objects of that culture, and face painting, are intimately related to the visionary world to which the Siona have access through *iko*, the vernacular name by which they refer to the liana *Banisteriopsis caapi* (Langdon, 1979).

I had time to include some of Pablo's drawings in the publication of my doctoral thesis the year after our meeting. From then on, I changed the focus of my research, dedicating more time to working with Pablo. I tried to provide him with the best possible art supplies, high quality canvas, paper, brushes and pigments. When Reichel-Dolmatoff was among the Tukano, they complained that the pencils he brought did not contain enough shades of yellow, the color par excellence of *yajé* visions, which in their mythology has a solar origin: Father Sun would have fertilized a woman through her eyes. Her radiant son would have been dismembered by the men of the maloca, giving rise to the various types of *yajé*. When I started bringing oils and gouache to Pablo, I was careful to offer him the widest range of colors possible.

As the paintings reached my hands, I started to organize small exhibitions and sell some paintings or reproductions at congresses, so that with the money raised I could bring electricity and running water to his house. I bought some of the paintings myself. Later, galleries and museums in several countries became interested in his work. Pablo was thus able to dedicate himself to painting, so that his work grew, in part stimulated by my questions. His work includes not only various aspects of local cosmology, but also his particular idiosyncratic

world. There are in his paintings representations of the “mothers” or “owners” of plants and lakes. Underwater worlds appear populated by dolphins, mermaids and *yakurunas*, or aquatic people who can kidnap people. There are fights between healers, because in the vegetalista conception of the world, the disease is the consequence of attacks by some sorcerer, or the spirit of some plant or animal. The Chullachaqui, entity of the forest, appears with one of its feet facing backwards, which can deceive lone hunters causing them to get lost in the jungle. Three great serpents (the Sachamama, the Yakumama and the Huairamama) preside over the kingdoms of the jungle, air and water. Pablo Amaringo’s work clearly is included in the Amerindian indigenous animist conception that can be found from Alaska to Tierra del Fuego, but it is also inserted within other currents that somehow reached the Peruvian Amazon, including esoteric literature and popular publications on science and technology.



I want to emphasize the animist aspect in Pablo’s work. Animism, which encompasses numerous local varieties, is not a religion or philosophy. It is a worldview that asserts the existence of infinite non-human persons, including plants, animals, rivers, lakes, mountains, winds, rains, and other meteorological phenomena. With all these people you have

to relate in a respectful and reciprocal way. The health of the individual, society and nature depends on this harmonious relationship, humans with the special task of protectors and co-creators of what exists. Although the concept of animism, common in traditional societies on other continents, still has in part the negative connotation given to it by the anthropologist Edward Burnett Tylor (1832-1917), who considered it a misguided primitive epistemology, the concept has been revitalized in our days by authors such as Graham Harley (2005), Nurit Bird-David (1999), David Abram (1996) and Stephan Harding (2021). It is an inter-relational and inter-subjective epistemology, based on identification or even transformation with what exists, and on direct observations and sensory experiences, from which arise, in addition to the creation of mythologies in different cultures, also practical knowledge, such as finding remedies or recognize concrete correlations between organisms and various aspects of the natural world. Animism, which some authors identify with the concept of panpsychism, recognizes that consciousness is inherent and constitutive of everything that exists. It represents a profoundly ecological sentiment, revealing the interdependence of our planet's various atmospheric, geological, hydrological and biological processes. The distance between traditional knowledge and scientific knowledge has narrowed as studies have emerged that reveal the intelligence of fungi, plants and animals, and the recognition that the planet regulates itself, which allows for the enormous biological diversity in which we live (Lovejoy, 1982). Animism also addresses unresolved philosophical issues, such as the relationship between mind and matter, consciousness and materiality, individual and community, issues of enormous relevance in the situation of existential precariousness in which an exclusively atomist and materialist view of the world has placed us, and in the face of cognitive challenge that involves the creation of virtual realities and artificial intelligence.

As Pablo developed his artistic production (and ethnographic, through the descriptions of his paintings), I began to make reproductions and show his work to some residents of Pucallpa and Iquitos who had had experiences with ayahuasca. The reaction was immediate: everyone recognized that they were visions of ayahuasca. Some colleagues took the images to indigenous communities, encountering similar reactions. Although many of the details were obviously idiosyncratic, the overall impression pointed to the visionary universe brought about by drinking the drink. When I showed some reproductions to Gerardo Reichel-Dolmatoff, he recognized their importance, encouraging me to continue this collaboration with Pablo and publicize his works.

In 1987 I commissioned Pablo a large oil painting (154 x 88cm) which he entitled *Cosmología Amazónica*, a kind of synopsis of his worldview based on his experiences with ayahuasca. Perhaps it is the masterpiece of the period between 1985 and 1994, in which we collaborated intensely, both for its pictorial quality and for the large amount of information it presents. The painting was accompanied by 35 handwritten pages, in baroque language, sparing punctuation and using frequent neologisms. The text is too large to be included here, but its beginning is significant:

In 1959-1962 there was a small house on the banks of the Fancha River, a tributary of the Ucayali River, where the ayahuasca purge was carried out every four days. It was there that I, Pablo Amaringo, became aware of the visionary apparitions that this plant, with its sublime effects provides, within a very peaceful meditation, placing myself in a fixed posture, as if I were static, without moving my eyes. It was when I was allowed to see many appearances of characters such as kings, queens, emperors in their royal courts, princes, princesses, ladies, courtiers and

therefore the entire royal family of sumptuous empires, multiple reigns with different genealogies, beings of great intelligence, with a beautiful appearance, with dazzling clothes, with lace full of precious stones that embellish the environment of palaces, temples, pavilions, hanging gardens, circular gardens with leafy trees, with exuberant vines with aromatic colored flowers, with birds of chromatic colors of sweet songs that captivate the soul when heard, so to speak, all these unknown worlds present a spectacle never seen in terrestrial physical life, you can also see legions of well-trained armies with superb weapons, with super radiological devices and being attacked by these powers too, they can neutralize them with the serpentine hypnotism of ultrasonic radars, therefore, still there is much to be done and said about these spectacular apparitions within the Amazonian cosmological vision, presented in this stunning painting with an incredible range, seen in the scene and in the colorful clothes.



As in most paintings of the time, the leitmotif is a typical Amazonian hut where a group of people are drinking ayahuasca. Four are around the drink bowl. A vegetalista appears blowing a

woman's crown. A man appears vomiting. It's a full moon night, near a lake. In the center appears a walled city, with a central gate and several towers. Each character has a specific role and name. The trees are also specific, and Pablo sometimes adds information on how to use them for various illnesses or curses, heal wounds, calm people or animals, quench sexual desire, or bring good luck in money and love. There are mentions of Atlantis and Hermes Trismegistus. The characters leaving the spaceship that appears to the right of the painting are supposed to come from Antares (a star in the Scorpius constellation), to help the shamans who drink ayahuasca. Pablo later wrote:

Although I had these visions, I could not reveal them to anyone because I didn't know anyone who was interested in them, so I am very grateful to Dr. Luis Eduardo Luna who asked me to paint these visions that I had when I was a shaman, which I did for the admiration and knowledge of people who are interested in knowing the great visionary apparitions that shamans experience when drinking the ayahuasca purge.

In 1991 we published the book *Ayahuasca Visions: The Religious Iconography of a Peruvian Shaman*, which includes forty-five visions accompanied by their explanations, adding, where possible, the scientific nomenclature of the plants and animals represented. I have added a series of footnotes relating elements in the paintings to various Amazonian and Andean ethnographic aspects. The book was preceded by a chronicle of my own research on vegetalismo in the Peruvian Amazon, a biographical section on Pablo and an analysis of some of the most striking iconographic elements in the paintings, such as shamanic fights, transformations, representations of plant and animal spirits, fairies, mermaids, flying saucers and archaic and futuristic cities. The book includes a careful thematic index that facilitates consultation.

Pablo Amaringo and I appear as co-authors of the book, sharing the royalties equally. The publication had an immediate impact, both in some academic circles and in the general English-speaking public (so far there has been no interest in translating the book into Spanish or Portuguese). The main reason, of course, is Pablo's spectacular paintings, and what they unravel about the extraordinary capacity of some plants to reveal the immense information and creativity that is perhaps latent in all of us. The book also presents some of the fundamental concepts of the "vegetalismo mestizo" in the Peruvian Amazon: the idea that ayahuasca, like other plants considered sacred, teaches; that the way to learn from them is through certain restrictions such as specific diets and isolation; that plants teach certain songs or melodies called *icaros*, which are the quintessence of the *vegetalista's* powers; that the *vegetalista* has vegetable or animal spirits that protect him and help him in spiritual struggles with rival *vegetalistas*, since the disease is widely conceived as an attack, sometimes manifested as darts that cause illness. Some authors have pointed out that the book *Ayahuasca Visions* marks the beginning of the so-called "globalization of ayahuasca", which had the city of Iquitos and its surroundings as the main focus of irradiation.

Thousands of people from all over the world now go to the Peruvian Amazon in search of experiences or some kind of cure in dozens of centers that have sprung up to welcome these people (Beyer, 2009; Fotiou, 2010; Labate & Cavnar, 2014). One of the consequences has been the growing interest of foreigners who arrived in the Amazon for ceramics and mainly for Shipibo textiles, since the knowledge spread that their iconography, as pointed out, for example, by Angelika Gebhart-Sayer (1985, 1987), is intimately related to ayahuasca visions, since the Shipibo songs take the form of geometric designs (*quinquin*) that penetrate the patients' bodies. Shipiba

women found a new market that stimulated the production of non-traditional fabrics, tablecloths, skirts and shirts, as happened among the Huicholes of Mexico, whose clothing iconography is linked to the visions produced by peyote. The iconography of other peoples of the Pano linguistic family, such as the Huni-Kuin (Cashinahua), is also related to sacred plants. The *kenés*, or designs, are attributed to Yube, the primordial shaman and owner of the anacondas, on whose skin such designs reside (Lagrou, 2009).

Our meeting also had an impact that continues to this day. Some young people started going to Pablo's house to learn to paint. On June 15, 1986, we officially created the Usko-Ayar (Spiritual Prince) School of Amazonian Painting, to which I dedicated almost eight years of work, buying high quality materials, photographing the paintings, writing articles and organizing exhibitions in Europe, the United States, Latin America and Japan. For some time we had the support of Finnida, a body of the Finnish Ministry of Foreign Affairs, but in addition to receiving small donations, the school was financed mainly by 50% of the sale of the students' paintings. The remaining 50% was received directly by young artists. Didactic and painting materials were completely free. A new school was built and served about 300 students. The idea was for everyone to be both students and teachers of those who knew less. Pablo's teaching method was based on observing plants, animals and jungle landscapes, which were memorized and recreated on paper. Pablo said that it was necessary to paint in the order in which the world was created: first light, determining where it would come from, then water and earth, animals and finally man, if they were included in the painting. The enthusiasm on the part of the students was extraordinary. The students, mostly from poor families, came to school in five shifts a day.

In 1992, through the Finnish biologist and diplomat Mikko Pyhala, whom I knew, Pablo received the Global 500 distinction from the United Nations, which resulted in his recognition in Peru as well. Pablo's fame as a painter of ayahuasca visions began to spread locally, stimulating the idea among local painters that it was possible to do this kind of work. Years later there would be a real artistic boom in the Peruvian Amazon related to plant life and sacred plants. As Norman E. Whitten (1993) prophetically observed in a review of the book *Ayahuasca Visions*, "The aesthetic forces of this new and emerging Amazonian style of painting unite ancient indigenous traditions of shamanic imagery with a cosmopolitan poetic myth. This is aesthetic cosmography at its finest, for its quintessence is imbued with transformation."

I was in Helsinki when, on November 16, 2009, I received the news of Pablo's passing. My sadness was enormous. There were many dreams and adventures shared during almost ten years of intense collaboration. I wrote a tribute that was read by Anderson Debernardi, one of his disciples, in Pucallpa on the day of his funeral. I received photos of his burial, with the presence of honor guards and a crowd that accompanied him to his permanent resting place. Something he said to me when I first met him came to mind. He wanted one of his paintings to be placed on his grave when he was buried, so that one day people would know that this man had been a painter. It was not necessary. Pablo Amaringo was celebrated while he was alive and is already part of the history of visionary art. His numerous disciples continue his legacy. His influence is indelible. His name will never be forgotten.

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Guto Nóbrega is Doctor in interactive art from The Planetary Collegium program (formerly CAiiA-STAR) based on the School of Art and Media, University of Plymouth - UK (2009). His doctoral thesis, funded by CAPES Brasil, is transdisciplinary research in the fields of art, science, technology, and nature in which he investigates how the confluence of these domains has informed the creation of new aesthetics experiences. His research focus on the ideas of interactivity, telematics, field theories, nature and hyperorganisms. Guto Nóbrega has received a postdoctoral title at Art and Technology at PPGAV/UnB (2019). He is an Associate Professor at School of Fine Arts at Federal University of Rio de Janeiro (UFRJ), member of the Postgraduate Program in Visual Arts at UFRJ and University of Brasilia (UnB), and is as Vice-Dean of the Centre for Arts and Letters/UFRJ. He founded and coordinates NANO - Nucleus of Art and New Organisms, a lab for artistic research and creation. Since 2019 he is a CNPq Research Productivity Fellow. His artworks have been presented widely in exhibitions and conferences in Brazil and abroad.

Maria Luiza (Malu) P. G. Fragoso [Brazil]

Maria Luiza (Malu) Fragoso is a Brazilian artist and teacher from Rio. Obtained her PhD in Arts and Multimedia from the State University of Campinas (UNICAMP, SP), in 2003, and her Post-Doctorate from the University of São Paulo (USP), in 2014. She is currently a professor at the Department of Visual Communication Design and the Graduate Program in Visual Arts at the Federal University of Rio de Janeiro (UFRJ). Published with Tania Fraga the title *4D. Computational Art in Brazil* (2005). Elected member of the board of directors of the

National Association of Visual Arts Researchers (2010-2012). Coordinator of NANO LAB - Nucleus of Art and New Organisms (nano.eba.ufrj.br) with Guto Nóbrega, also editors of the book series and events under the title Hiperorgânicos. Organiser of the Computational Art Congress - CAC.4, in Rio de Janeiro (2014). Her work focuses on transdisciplinary and transcultural aspects between art, nature, science and technology. Develops artistic practices that address the interaction between traditional knowledge and scientific knowledge, focusing on experiences with land workers and Brazilian indigenous cultures. Participated in several exhibitions in Brazil and abroad, and her works are part of the collection of the Brasília Art Museum and the National Museum of the Republic.

Carl Hayden Smith [United Kingdom]

Carl Hayden Smith is Associate Professor of Media in the School of Arts & Creative Industries at the University of East London and is the former interim Head of Research and the Director of the Learning Technology Research Centre (LTRC) at the Institute for Creativity & Technology, Ravensbourne University London. His research focuses on the relationship between technology and the human condition. Carl has twenty years of experience conducting R+D into the application of hybrid technologies for perceptual, cognitive and creative transformation. His research interests include Embodied Cognition, Spatial Literacy, Context Engineering, Umwelt Hacking, Natural Media, Sensory Augmentation, Artificial Senses and Body Hacking. He is co-founder of the Cyberdelics Society and the London Experimental Psychonautic Club. Both organisations explore the myriad of ways that it is possible to produce and examine Altered States of Consciousness. His other projects include AR4EU (Code Reality), Hobs Academy, Contextology, Holotechnica and the Museum of Consciousness.

Edward A. Shanken [USA]

Edward A. Shanken believes that by opening our hearts more fully to ourselves, we can open our hearts more fully to others and to the Earth. While attempting to integrate joy and wisdom, he discovered that joy contains its own wisdom, and vice versa. Ultimately, he tries to love everybody and tell the truth. He is best known for his books and essays about art and technology, which are informed by his artistic practice as a pianist and dancer. His books include *Telematic Embrace: Visionary Theories of Art, Technology and Consciousness* (2003), *Art and Electronic Media* (2009), *Inventar el futuro: arte, electricidad, nuevos medios* (2013) and *Systems* (2015). Recent publications address art and shamanism, environmental art, music as medicine, sound art, and bridging the gap between new media and contemporary art. Website: <http://artexetra.com>.
Into the light!

Jeremy Narby [Canada]

Jeremy Narby, Ph.D., studied history at the University of Kent at Canterbury, and received a doctorate in Anthropology from Stanford University. For the last 32 years, he has coordinated projects in favour of Amazonian people for Swiss NGO Nouvelle Planète, involving land titles, bilingual education, and sustainable forestry. He has written several books, including *The Cosmic Serpent, DNA and the Origins of Knowledge* (1998), and *Intelligence in Nature: An Inquiry into Knowledge* (2005), and co-edited with Francis Huxley *Shamans Through Time: 500 Years on the Path to Knowledge* (2001). He recently co-signed with Rafael Chanchari Pizuri *Plant Teachers: Tobacco and Ayahuasca* (2021).

Luis Eduardo Luna [Colombia]

Luis Eduardo Luna was born in Florencia, Colombia, in 1947. He has a degree from the Complutense University of Madrid (1972), an interdisciplinary master's from the University of Oslo (1980) and a doctorate from the Department of Comparative Religion at the University of Stockholm (1989). He received a fellowship from the John Simon Guggenheim Memorial Foundation, was nominated for a study of the ethnobotany and ethnomedicine of the Colombian and Peruvian Amazon (1986), and is a Doctor of Human Letters, Honoris Causa, from Saint Lawrence University, Canton, New York (2002). He was an associate of the Botanical Museum at Harvard University (1987) and was elected a Fellow of the Linnaean Society of London (1989), and was Assistant Professor in Anthropology (1994-1998) at the Department of Anthropology at the Federal University of Santa Catarina (UFSC) in Florianópolis, Brazil. He retired in 2011 from the Department of Modern Language and Communication at the Hanken School of Economics, Helsinki. In addition to numerous scientific publications, Dr. Luna is the author of *Vegetalismo: Shamanism Between the Mestizo Population of the Peruvian Amazon* (1986), co-author with Pablo Amaringo of *Ayahuasca Visions: The Religious Iconography of a Peruvian Shaman* (1991), and co-author with Slawek Wojtowicz, Rick Strassman and Ede Frecska of *Inner Paths to Outer Space: Journeys Through Psychedelics and Other Spiritual Technologies* (2008). He is also co-editor with Steven White of *Ayahuasca Reader: Encounters with the Amazon's Sacred Vine* (2000, second expanded edition in 2016). Dr. Luna has lectured in many countries on indigenous and mestizo shamanism and has curated visionary art exhibitions in Europe, Latin America, the United States and Japan. He is the Director of Wasiwaska, Research Center for the Study of Psychointegrating Plants, Visionary Art and Consciousness,

Florianópolis, Brazil (www.wasiwaska.org). As of June 2022, he is also an Honorary Research Fellow at the University of Exeter, England.

Olga Kisseleva

Olga Kisseleva is an international artist with a research science background, working interdisciplinary at the science-art intersection. She is interested in critical social practice and the role of science in art for an age marked by technological progress and an ecological crisis. Founder of the Art&Science Laboratory at the University of Paris 1 Panthéon-Sorbonne, Olga Kisseleva plays a pioneering role in the field of contemporary creation, research, and reflection on emerging and progressive forms of creation. She has had major exhibitions in Kiasma (Helsinki), Centre Georges Pompidou (Paris), Museum of 21st Century Arts - MAXXI (Rome), Fondation Cartier (Paris) and in the Venice, Istanbul, Berlin and Moscow Biennials. Her works are present in many of the world's most important museum collections, including the Centre Pompidou (Paris), the Louis Vuitton Foundation (Paris), the ZKM (Karlsruhe, Germany) and the MoMA (New York). In 2020, for her *EDEN (Ethics - Durability - Ecology - Nature)* project, focused on plants' intelligence, Olga Kisseleva awarded the S+T+ARTS Grand Prize for innovative collaboration between technology and art that opens new pathways for innovation.

Roy Ascott [United Kingdom]

Roy Ascott, recipient of the first Ars Electronica Golden Nica award for Visionary Pioneers of Media Art, focuses on the impact of digital and telecommunications networks on consciousness. His work has been shown at the Shanghai Biennale, Venice Biennale, Milan Triennale, Biennale do

Mercosul Brazil, European Media Festival, INDAF 2010 Korea, and the Musée d'Art Moderne, Paris. His work is in the permanent collection of the Tate Gallery, London and other notable collections. He has advised universities, arts councils, media centers, and festivals in Europe, Australia, Brazil, Canada, China, Japan, Korea, USA and in the UNESCO. He is the founding President of the Planetary Collegium, an international network for doctoral research. In 2012, Roy Ascott became DeTao Master of Technoetic Arts at the DeTao Masters Academy, to promote the development of teaching and research in art, science, technology and consciousness in China. Since 2017, he has also been the Chief Specialist of the Visual Art Innovation Institute at the Central Academy of Fine Arts in Beijing.

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