



THE METHOD OF COEXISTENCES: *Between relativity and quantum theory?*

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Abstract

It is increasingly clear that the complexity of life is quantum-gravitational-sensitive, resulting from billions of years and instantaneous connections over very short, short, long and very long distances. The forces are diverse, electromagnetic and gravitational, strong and weak, generating energy to sustain the unity of the universe and the formation of life as we know it on Earth. However, we still have research and debate to do until we build a scientific method that is coherent with all this complexity. We recognize that there have been important advances in Physics, Astrophysics, Biology, Geography, in short, in different areas of knowledge; however, there are still many controversies about various aspects related to the origin and reproduction of our life. In this text, we challenge ourselves to reflect, based on a long process of action research already carried out, on some possibilities of mixing aspects of different methods, in particular, combining trans-scalarly with trans-temporality and trans-territoriality, which we have called the method of coexistence, precisely to try to contribute to the understanding and explanation of some everyday and procedural meanings of life that we have here on Earth. We hope that the results achieved so far will serve as motivation for other people to debate with us, on a horizontal and dialogical level.

Keywords: Coexistence. Transtemporality. Transscalarly. Transterritoriality. Original knowledge. Sciences.

O método das coexistências: entre a relatividade e a teoria quântica?

Resumo

Está cada vez mais claro que a complexidade da vida é quântico-gravitacional-sensível, resulta de bilhões de anos e conexões instantâneas de curtíssimas, curtas, longas e larguíssimas distâncias. As forças são diversas, eletromagnéticas e gravitacionais, fortes e fracas, gerando energia para sustentar a unidade do universo e a formação da vida que conhecemos na Terra. Porém, ainda temos para pesquisar e debater até construir um método científico coerente com toda essa complexidade. Reconhecemos que há avanços importantes, na Física, na Astrofísica, na Biologia, na Geografia, enfim, em diferentes áreas do conhecimento, no entanto, ainda há muitas controvérsias sobre vários aspectos relativos

à origem e reprodução da nossa vida. Então, neste texto, desafiamo-nos a refletir, a partir de um longo processo de pesquisa-ação já realizado, sobre algumas possibilidades de misturar aspectos de distintos métodos, em especial, combinando a transescalaridade com a transtemporalidade e transterritorialidade, que temos denominado de método das coexistências, justamente para tentar contribuir na compreensão e explicação de alguns significados cotidianos e processuais da vida que temos aqui na Terra. Esperamos que os resultados conseguidos até agora sirvam de motivações para outras pessoas debaterem conosco, num nível horizontal e dialógico.

Palavras-chave: Coexistência. Transtemporalidade. Transescalaridade. Transterritorialidade. Saberes originários. Ciências.

El método de las coexistencias: ¿entre la relatividad y la teoría cuántica?

Resumen

Cada vez está más claro que la complejidad de la vida es sensible a la gravedad cuántica, el resultado de miles de millones de años y conexiones instantáneas en distancias muy cortas, cortas, largas y muy grandes. Las fuerzas son diversas, electromagnéticas y gravitacionales, fuertes y débiles, y generan energía para sostener la unidad del universo y la formación de la vida tal como la conocemos en la Tierra. Sin embargo, todavía tenemos que investigar y debatir para construir un método científico coherente con toda esta complejidad. Reconocemos que existen avances importantes en Física, Astrofísica, Biología, Geografía, en fin, en diferentes áreas del conocimiento, sin embargo, aún existen muchas controversias sobre diversos aspectos relacionados con el origen y reproducción de nuestra vida. Así, en este texto nos desafiamos a reflexionar, a partir de un largo proceso de investigación acción ya realizado, sobre algunas posibilidades de mezclar aspectos de diferentes métodos, en particular, combinar la transescalaridad con la transtemporalidad y la transterritorialidad, lo que hemos llamado método de convivencia, precisamente para intentar contribuir a la comprensión y explicación de algunos significados cotidianos y procedimentales de la vida que tenemos aquí en la Tierra. Esperamos que los resultados alcanzados hasta ahora sirvan de motivación para que otras personas debatan con nosotros, a nivel horizontal y dialógico.

Palabras clave: Coexistencia. Transtemporalidad. Transescalaridad. Transterritorialidad. Conocimientos originales. Ciencias.

1 Introduction

How daring it is for a geographer to write about relativity and quantum mechanics. However, we do not intend to raise false expectations. Since now we warn you that we will be moving much more at the theoretical-methodological and pedagogical level, trying to contribute to the debate on a method, perhaps, appropriate for understanding, representing and explaining space-time and society-nature relations, trans-multiscalarity and transtemporality and, obviously, the simultaneity of phenomena and processes present in our daily lives. Historical processes are relational and relations - at different scalar levels - are procedural. There is no way to separate them as is normally done scientifically and philosophically.

In Saquet (2022a, 2022b, 2022c, 2023a, 2023b, 2024), we have already carried out a critique of academicism that is part of the North-Eurocentric, “modern” and

“postmodern”, urban-centric, globalizing and universalist methods that contribute to objectifying subjects and nature outside our bodies. Therefore, our own daily life.

It is increasingly clear that the complexity of life is quantum-gravitational-sensitive, resulting from billions of years and instantaneous connections over very short, short, long and very wide distances. The forces are diverse, electromagnetic and gravitational, strong and weak, generating energy to sustain the universal unity between everything that exists in the Earth-solar system-galaxy-cluster of galaxies-universe relationship. Our existence (men, other animals, plants, rocks, etc.) is an (im)material and very temporary manifestation of the continuous universal flow that is in constant metamorphosis; there are continuous physical-chemical, spatial, temporal and sensitive interactions, with reactions that seem to be (im)predictable (SAQUET, 2020 [2007]).

Gravity and quantum field mutually “pull” each other, preventing the collapse of our natural-cosmological-social life (COX and FORSHAW, 2016). Life, therefore, is extremely simultaneous and procedural, delicate and sensitive, (re)produced in historical phases and coexistences, in time and space, with leaps that seem to be, at least from Earth, quanti-qualitative. “Everything belongs to other lives, has already lived in various forms and times, everything is readapted, resystematized, reformed” (COCCIA, 2022, p. 109).

The movement back and forth, with distortions and curves, fusions and explosions, reactions and (ir)regular connections, with a lot of energy and constant rebirths, requires a method that is as appropriate as possible for its understanding, representation and explanation. Even though we know that we are far from this theoretical-methodological construction in time, we have argued, based on our theoretical, conceptual and empirical-reflective research, in favor of a method that has been (im)materialized in a versatile, sensitive, horizontal and transversal movement of participatory action-research. This has occurred with a lot of intimacy with the subjects of each project, with observation, attention, listening, in short, in the direction of a popular and sustainable territorial science, very attentive to the investigative and explanatory processes and, above all, to the preservation of the precious life that we have (SAQUET, 2022a).

Thus, instead of separating subject and object, society and nature, university and territory, theory and empiricism, science and popular knowledge, particles and waves, atoms and filaments, relativity and quantum mechanics, we believe it is essential to reconstruct the theories and concepts we have in(sub)verting them and making them coexist in a single unit of life and analysis. Versatility, horizontality and sensitivity are essential in the method of coexistence or simultaneity (SAQUET, 2023a), as we need to balance the different scalar and interactive levels (close, intermediate and distant) of each process of research, understanding and explanation, as well as reason and emotion. We need to improve our thinking, increasingly, in a dis-continuous movement, to understand the internal and external movement of our own body, thought and, of course, the universe.

So, it is also clear that it is urgent to further revolutionize existing sciences and philosophies, contributing greatly to breaking the domination of empirical and logical-deductive positivist reasoning, as well as academic “modern” and “postmodern” (materialist, immaterialist and hybrid) theories. These are theories that, historically, contribute to objectifying subjects and nature outside our bodies,

separating everything and everyone, theory and empiricism (with its experiments), often masking processes and relationships, colonization and coloniality, “mercantilizing” the world we know, seriously compromising the continuity of our common life. This does not mean, however, that European and US theories should be discarded: much more dialogue is required, as we have already explained in other publications, and we hope that this will also be clear in this text.

Therefore, economic, political, environmental and cultural (philosophical, scientific, etc.) liberation and decolonization are urgent and vital for everyone, and not only for the most vulnerable classes as we have previously stated. This does not mean, of course, a simple denial of the theories of the North; on the contrary, dialogue is necessary, with respect, horizontality and international cooperation.

Our goal, therefore, is to encourage debate and reflection on an applied critical science (or critical applied science), at the interface between criticism and denunciation, proposal and implementation of actions aimed at the common good. The challenge is immense, however, it is necessary to - at least - continually instigate reflection on science and the university, especially on some meanings of our precious life, while it exists in the form we know it.

Critical science, as we know very well, is fundamental to qualify our consciences and to know ourselves more deeply, and its applied content is essential to gain time and quality in the use of the knowledge we produce in different areas of knowledge, activating localized territorialities (often “invisibilized”) and enhancing creativity to solve common problems.

The theories of relativity (from Albert Einstein onwards) and quantum mechanics are other motivations for our debate and reflection, together with the ongoing process of collapse of the Earth-solar system, within the Via Lactea and, apparently, of the universe itself as known up until now. The motivations are also related to the extreme precariousness of the lives of billions of people who do not live human lives, i.e., who are under daily conditions of humiliation and dependence, risks and insecurities (of the most diverse kinds), hunger and poverty, expropriation and exploitation, discrimination and racism, under various forms of violence (which obviously include war), extreme environmental impacts, etc.

Thus, the back and forth between different scales, from micro to macro and vice versa, is fundamental to our arguments, as we believe that there are, among us, academics or not, different worldviews (MANNHEIM, 1952; BOHM, 1980), in order to understand different processes that connect and influence each other incessantly. These visions coexist with perceptions, feelings, imaginations, dreams, rites, myths, etc., as well as with different simultaneous experiences in time and space, transmitted with changes and permanences. There are experiences and conceptions experienced daily, trans-scale and historically (with more or less reflection and depth), from different spaces and times, i.e., from “angles” that facilitate or not the understanding of certain social-natural-cosmological phenomena.

So, how can we understand, in a deep, coherent, critical and applied way, simultaneously, the macro and micro scales and world views? Can we build a popular and sustainable territorial science, increasingly useful for the billions of people who so need our academic research? Is it possible to gain time, without losing quality, in the construction of a common good for all, safeguarding life on Earth?

By common well-being, we understand that it is necessary to care for everyone, in a sustainable way environmentally, culturally, politically and economically, based on the Earth as a heritage, therefore, common to all of us (humans and non-humans). For such care, the most coherent and complete theoretical-methodological conception that we know – until now - is that of a popular territorial science, constructed simultaneously with a critical and applied approach.

And, to produce a popular and sustainable territorial science, as our historical learning clearly reveals, it is necessary to dive into the everyday life and heterogeneity of each space-time, socially transformed into a territory, coexisting with the different subjects, knowledge and actions, with life experiences, worldviews, techniques and technologies. To produce this science, it is necessary to immerse oneself in the daily territorialities and temporalities, integrating theory and empiricism; reason, feelings and sensibilities; it is necessary to feel-think¹ by doing and to do feeling-thinking², co-producing knowledge and common solutions to problems that are normally common among us.

They are common because the Earth is an extension of our body and, evidently, we are a little piece of the Earth. This is the mother who, in the thinking of the “ancient” (from the time of the conquest of America) Nahuas, Mayans and Incas, together with water, relates us to the origins of the cosmos through the femininity of water and the motherhood of the Earth. Water-Earth-Sky-Sun are intimately linked and determine our life by happening simultaneously: the Sun illuminates the sky and the Earth; the latter is the mother of the gods and the Sun: “The Earth-Sun relationship has reciprocal support in life” (REYES, 2009, p. 76). “Our mother star, the Sun, is a dwarf star and inhabits a very quiet and somewhat peripheral region of the galaxy that hosts us” (TONELLI, 2021, p. 31).

The Earth is *Pachamama* (for the Andean indigenous people), as a “universal being that lives” (REYES, 2009, p. 79) within the scope of natural and cosmological relations. Time – even that of the indigenous calendar – is the universal time that influences the constitution of the human being and the cosmos itself (among the Mayans, for example). Among the Náhuatl (from central Mexico), the universe and the Earth are subdivided into regions of the gods, the living and the dead; however, Earth-universe are interconnected (LEÓN-PORTILLA, 2009).

Mother Earth or “grandmother”, therefore, is fundamental to give the “vuelta al nosotros”, i.e., to return to our existence, walking in the sense of time of the “spirit of the body”, feeling-thinking-acting³ and researching-feeling-thinking⁴, understanding with the “heart” – without disregarding the mind and reason -, the time-space Earth and our existence in indivisible unity (*Pacha-Kawsay*, in Kichwa – Ecuador) (QUINTERO WEIR, 2021).

In this sense, to generate a common good life, we need many cultural (philosophical, scientific, etc.), environmental, political and economic changes, i.e., technological, religious, sentimental, financial, energy matrix, State and public policies. Other sciences are essential, more suited to the heterogeneity of each

¹ In the original, the author created the neologism “sentipensar” (N.T).

² “[...] sentipensando” in the original (N.T).

³ In the original, “sentipensando-agindo” (N.T).

⁴ In the original, “pesquisando-sentipensando” (N.T).

country, region, municipality, city, rural community, more coherent to each time, space, scale. This is very clear: we need other sciences and knowledge for other sociabilities and society-nature/cosmos relationships.

This means that we believe it is urgent to produce more and more science to generate solutions to the problems of each people and society, understanding in a more complete and profound way the meanings of life, increasingly directing research to solve problems, especially of the most vulnerable social classes, given their extremely serious daily life situation. It is also essential to work much more with the subjects and social movements of environmental struggle and confrontation, in an effective science of the praxis of insurgency and resistance to colonization and domination, to the contamination and degradation of our own nature (SAQUET, 2020 [2007], 2019, 2021, 2022a, 2022b, 2022c, 2023a).

2 Arguments in favor of theoretical-methodological and political inversion and subversion

Given the extremely serious environmental situation and our common life, it is urgent to drastically rethink and reconstruct the theories and methods used in science and, obviously, in social sciences and in relation to society-nature relations. Metaphorically, we believe that this can be done using a pair of bifocal glasses, which contain lenses to see from close up and from far away, simultaneously, the micro and macro scales and interactions, their different phenomena and processes, the quantum-gravitational, the urban and the rural, nature and society, time and space, in short, generalities and singularities.

When we observe a distant “object” with the naked eye, such as the Moon, we see it in small size, without details; however, if we could pull it closer to us, we would see it in much larger size and in detail. When we ride a bus in any city, we can see some aspects of the streets, especially their sides. However, when we walk in the same city and on the same streets, we can observe in much greater detail the characteristics of space and time itself, for example, of daily mobility; it is possible to observe its sides (width), heights (buildings) and the path of the street (its length), i.e., its three-dimensionality; and furthermore, with due caution and attention, it is possible to feel and perceive its four-dimensionality, incorporating time into our sensations, observations and analyses.

Thus, conventional representations and uses of deduction and induction are not enough; they need to be “laid down” and used in a versatile way, from different angles, with different techniques and procedures that, for us, assume special suitability when we research historical phases and other simultaneous activities (SAQUET, 2023b). This procedure can be used in research and/or in action (in cooperation with the subjects of each project), in different areas of knowledge, but not in the traditional understanding of “top down” or “bottom up”, micro or macro, regular or irregular, chaos or order, theory or experiment.

We need to place ourselves horizontally, to see and be able to observe the horizon (without disregarding the vertical totalities in relationships and spatially broad networks), to hear and listen to the subtleties, the noises and silences, to understand the colors and the colorless, the rhythms and interactions (natural-social-cosmological), the flavors and odors, the knowledge and actions, the inequalities and

differences. Therefore, considering what we have already learned, we can see and understand the singular details and generalities that can reveal, for example, regular, subtle *and* multidirectional movements at different trans-multiscalar levels. And, perhaps, we can understand the quantum *and* the gravitational, simultaneously, in the scope of reason and emotion, of the mind and the “heart”.

Perhaps everything is everywhere, at least in relation to life as we know it, considering the different particles, atoms, molecules, cells, waves and endless connections, filaments and waves. So, researching and/or cooperating by working only in theory or in empiricism, in society or in nature, only in phases is not enough to remake the sciences, making them more coherent and profound about our lives, as well as to co-construct profound changes in society and the territory, based on the common good-being for all. It is not about disregarding or devaluing the phases, but about completing them in the best possible way, increasingly integrating the scales *and* interactions, theories *and* empiricism, contemplations *and* analyses of the “object”, with our sensitive and thinking immersion in the research and/or action problem.

Colmenares (2012), in an intriguing reflection on participatory action research, consistently highlighted the importance of phases for the expansion of knowledge and for producing concrete responses to the problems being researched; she argues in favor of engaging the social actors of each project, as they can become researchers, an aspect that certainly enhances this theoretical-methodological option. However,

[...] en mis desarrollos investigativos presento cuatro fases, a saber: Fase I, descubrir la temática; Fase II, representada por la coconstrucción del Plan de Acción por seguir en la investigación; la Fase III consiste en la Ejecución del Plan de Acción, y la Fase IV, cierre de la Investigación, en la cual se sistematizan, categorizan y generan aproximaciones teóricas que pueden servir de orientación para nuevos ciclos de la investigación, creando un binomio entre el conocimiento y la acción, procesos que coadyuvan a la potenciación de las transformaciones esperadas; por supuesto que todas estas fases van integradas por procesos reflexivos permanentes de todos los investigadores involucrados (COLMENARES, 2012, p. 107).

Your choice clearly considers planning, research (diagnostic), action (joint) and evaluation (during action-research), involving different subjects, in different phases and stages followed historically. The recognition of the coexistence between knowledge and action appears very subtly in your arguments, however, actions are considered as a source of knowledge, an aspect that we consider essential to try to break with explanatory fragmentations, conceptual and knowledge hierarchies, as well as to try to overcome the traditional separation between theory and empiricism and/or experimentation.

And the literature is vast, but we do not intend to extend on it in this text, especially because we have already explained the adequacy and richness that occurs at the level of thought and other actions, when quantitative and qualitative techniques and procedures coexist, in time and space that has become a territory of life and not of death.

Furthermore, perhaps some components of matter-immateriality are everywhere, while other elements may not be. One aspect that seems clear is that

we are the past of about 13.8 billion years objectified in our bodies and souls! So, there are many things in many places that condition our current life, things spread out in time and interconnected in space by very ancient and very long waves that we consider transtemporal and transterritorial. Thus, there are many things coexisting, spread out in space-time, connected, very recent and very ancient, very short and very wide. We were once gases and dust, other bodies (particles-waves-energies); we have been eaten/consumed and returned to celestial nature many times, so here we are, simultaneously, influencing the continuity of the Earth and the universe.

That plasma-fabric of the origin of the universe formed by quarks and gluons, very hot, transforms into photons, protons, electrons, neutrons and the aggregation of matter dominated by energy, forming a field of forces and filaments, where photons and neutrinos float everywhere. A few moments after the Big Bang (recognized in the international literature cited here), the universe is full of the lightest particles, containing, together with neutrinos, the essential ingredients for the formation of stable matter; when neutrinos separate from the field of forces, they wander aimlessly and everywhere, for billions of years, contributing to balancing the universe; with the cooling of the universe, helium and hydrogen (and other atoms) are formed and, slowly, the primordial nucleus (of the universe) are substantiated from the formation of stars (TONELLI, 2021). Everything occurs in an intense relationship of attraction-repulsion (collision, explosion, fusion) and interaction of particles and atoms, forming the “era of matter”, with a lot of gas and dust, according to Guido Tonelli, together with light and molecules that, in short, sustain the life we know.

This light produced, together with heat, in stars (which are born from hydrogen-helium fusion), especially in the large and oldest ones, as these generate carbon and oxygen, iron and nitrogen and, of course, a lot of energy radiated into the universe.

The many elements of which the planets, and ourselves, are made had to come from somewhere, and many of them arose in the very centers of the oldest stars [...]. We are indeed made of stars. The heaviest atoms that make up the Earth, and life on Earth, were formed billions of years ago in a giant furnace in the very centers of the stars that are now ending their lives. (DUNKLEY, 2023 [2019], p. 127).

General principles and movements originate from microscopic singularities (atoms and particles), interactions and reactions between gravity and quantum mechanics. “In other words, the electrons that circulate in the electrical wires we have at home, and those that occupy the atomic orbitals at our fingertips, were born in the first moments of the universe’s life” (TONELLI, 2023, p. 141).

Heterogeneity, therefore, of the universe and of our daily life, simultaneously, with uniformity and possible fluctuations in temperature, orders and explosions, electromagnetism and gravity, strong and weak forces, distinct soil and climate conditions, different worldviews, rituals and knowledge, connections and reciprocity, which happen there and here, at the same time. And this is what seems to have happened, in short, in the formation of the first stars, compressing the gas by the force of gravity, triggering nuclear fusion and, thus, a lot of light energy, essential for our life on Earth (TONELLI, 2021).

It is the gravity of dark matter that attracts cosmic structures towards each other, weaving the web in which galaxies and galaxy clusters are found (DUNKLEY, 2023 [2019], p. 168).

We feel gravity, and space is the medium through which the force of gravity communicates (GREENE, 2001, p. 91).

Thus, as Greene (2001) warned – among other researchers – the challenge of unifying the understanding and explanation of the large and the small, of matter and energy, of quantum mechanics and relativity, is immense; it requires a lot of patience and perspicacity to understand the explicit and the hidden, the regular and the irregular of the cosmic tissue, the frenzy of quarks and the dance of stars and galaxies in the intertwining of time and space. Perhaps, and this is quite possible, as this same author warned in a later work (GREENE, 2021), one of the keys to reading lies in the unity of reason and emotion.

So, to understand this extremely complex and heterogeneous problem, while many intellectuals reproduce hegemonic norms, techniques, concepts and theories linked to the order of empiricizing (or experimenting) theories, we are working, with many difficulties, on counter-hegemony, i.e., trying to theorize empiricism, without denying the empiricization of theory, that is, practicing a simultaneous horizontal movement of research-reflection-action-reflection-research etc., as we will illustrate later.

As we know very well, “in essence, the process of division is a convenient and useful way of ‘thinking about things’, especially in the domain of practical, technical and functional activities [...]” (BOHM, 1980, p. 20; emphasis in the original). Eurocentric thought with a strong influence from Greek philosophy through a materialist and rationalist conception of science in which nature is disconnected from thought, as an “entity” to be abstracted and dominated, as matter or fundamental “substance” (WHITEHEAD, 2019 [1919]).

In a hegemonic manner, in different areas of scientific knowledge, but especially in the social sciences, the “object” is contemplated through some predefined theory, be it socially critical, materialist, idealist, hybrid, etc.; often there is no goal of knowing (the “object”) effectively as it is in its internal and external contradictions, in its movements and connections, in its orders and disorders, in its continuous metamorphoses. Thus, aspects of the fantastic heterogeneity-indivisible unity of the world of life are not normally achieved.

Theorizing is done only with mathematical formulas and calculations. Theory is empiricalized, usually applying it inappropriately, without recognizing the immediate fusion of researcher-researched, time-space, society-nature, matter-idea, chaos-order, particle-wave, explosion-connection, etc. “Chaos disguised itself as order, dressed up in the beautiful mask of balance and harmony, and this great deception has reassured and calmed us for millennia” (TONELLI, 2021, p. 174).

Regarding the relationship between society and nature as experienced daily, hegemonically, in the many studies we have read, the order of capital, the processes of subordination and dependence, the expropriation and concentration of land, and, in short, the concentration of capital and the centralization of power, stand out. The order of capital seems uncontrollable and desirable to all, absolute and sovereign,

which leads us to work, in general, to “participate” in the global order fantasized by exciting metanarratives that, by the way, neglect our strength as thinking and creative beings, at any longitude and latitude, of any color, religion, or gender.

It is common to disregard the chaos of the daily lives of the subaltern, exploited, discriminated against, and expropriated, who need to be understood from a theoretical-practical conception constructed for this purpose. Details are neglected because they are considered simple subjects; theoretical-methodological hybridisms are denied in the name of the “purity” of the scientific and philosophical method. The knowledge and practices of indigenous peoples, their rich and diverse worldviews, are disregarded because they are classified as inferior to “modern” or “postmodern” sciences.

In this way, it is easy to identify the reproduction of Cartesian thought, separating science from popular knowledge, theory from empiricism and its experiments, the researcher from the subject and “object” researched, society from nature, the near from the distant, reason from emotion, contributing to strengthening neoliberal and bourgeois strategies, as well as contemplative arguments about nature and society. Conservatism is preserved, in which globalization appears as a natural and inevitable result for everyone. Normally, there is no project or program, much less any public policy in favor of justice, as Hinkelammert (1988) argued very well.

Many of us do not recognize that the universe is indivisible and in continuous movement, of which we perceive, through our limited senses and technological resources, only the apparent (“insights”, according to David Bohm) of endless daily and instantaneous connections, multilateral and multidirectional, multidimensional, therefore, transtemporal, trans-multiscalar and transterritorial.

As far as we know, dark matter exists in every galaxy and in every group and cluster of galaxies. It not only resides within and around these large cosmic objects, but it is spread throughout space to form a vast cosmic web of interconnections (DUNKLEY, 2023 [2019], p. 151).

We also have many difficulties, on a daily basis, in recognizing the unity of thought-nature/cosmos-society, as a process of continuity in discontinuity and discontinuity in continuity, of changes and permanences, called by Lefebvre (1968) permanent revolution. However, this is what we live, a movement of (im)material discontinuities: time and space are in an inseparable unity, with regularities in change and changes in universal regularity (SAQUET, 2020 [2007]).

Relationships and reactions drive movement, overcoming, which is fleeting, fluid, ephemeral, is in discontinuity, in the “new” and the “old”, always contained in movement, up, down, sideways, spinning and twisting. Oh, yes, the procedural-relational movement is difficult to grasp, but it can be understood, at the level of thought, considering that movement is in the universe and the universe is in movement and in the movement. With this, the “old” is not eliminated, but overcome, remaining, in the “new”. It is a process inherent to the universal movement/event (SAQUET, 2020 [2007]).

In the event there is the substance of nature (with thought), space-time, simultaneity and instantaneity: “A duration holds within itself the passage of nature” (WHITEHEAD, 2019 [1919], p. 69). A temporal duration has an extension that overlaps

another duration, with dis-continuities, which we call transtemporal (processual-relational); a spatial extension also extends over other spaces, with dis-continuities, which we call transterritoriality.

We can understand the very “void” of the universe and its energy flows and waves by feeling and thinking about it from the “heart”, with sensitivity – without disregarding gravity and quantum theory, calculations and measurements. Not only do we interact⁵ with universal energy, we are an uninterrupted flow of energy: our bodies-territories are food for other (universal) bodies and, at the same time, we eat various bodies that contain universal energy. Radio waves and microwaves, for example, are everywhere, passing through walls and our bodies (DUNKLEY, 2023 [2019]).

We are in the relativity of the cosmos and we cannot move away from it to understand it deeply, relating, sharing, living in daily coexistence, minute by minute, second by second! Body-Earth-universe are “relational united” in a “cosmo-existence” (QUINTERO WEIR, 2021, p. 37).

The universe demands rites so that time can follow its course. Human times are confused with cosmic times and these are helped in their movements by the rites that humans perform at the right moments (REYES, 2009, p. 140).

The continuity of nature arises from extension. Every event extends upon other events, and other events extend upon every event (WHITEHEAD, 2019 [1919], p. 72).

And it is in this sense, of an increasingly complete understanding of life, that the movement of knowledge production cannot be deductive or inductive, neither macroscale nor microscale. For this reason, we have striven, over the years, to co-produce knowledge in territories of horizontality, with adequate communication, a lot of listening, observation, participation and mutual cooperation between “researcher” and “researched” who is also the subject of each action-research project or program. We are working, although always with many difficulties, in a way that overlaps deduction *and* induction, micro *and* macro, near *and* far, as we highlighted in Saquet (2023a, 2023b), coexisting bodies-relations-networks-waves-energies-society-nature.

The look and observation must occur in a way that facilitates the apprehension and understanding of social-natural-cosmological, spatial-temporal-territorial (relational-procedural) coexistence, as well as micro and macro-scalar, i.e., trans-multi-scalar, multidirectional and transtemporal. “I learned to interpret smiles, to guess whispers, to read eyes, to reconstruct random reasoning from a sentence, from a word in the air” (MEMMI, 2008, p. 110).

This is a slow and difficult movement of thought linked to life (from within it, therefore, without objectified and separate objects), as it needs to be, because thought (processual-relational) and everyday reality (processual-relational) are not separate: we are body and soul-energy-spirit, simultaneously, which need to be understood, therefore, in a transtemporal, trans-scalar and trans-territorial way, in a

⁵ The author, in the original, used a neologism: “interatuamos” (N.T).

way that is always versatile, sensitive and transversal, considering, evidently, the objectives, goals and scales of each research and/or action project. Thought understands the reality of which it is itself a part, in an uninterrupted unity and movement.

Day after day, your body burns the food you eat and the air you breathe to provide the energy that powers your internal gears and external activities. Even the very act of thinking—the molecular movement that occurs in your brain—is driven by energy conversion processes. (GREENE, 2021, p. 57).

And here, another aspect to highlight is that, according to the objectives and goals of each project, we need to guarantee decision-making autonomy for all those involved in the process, as well as the maximum possible originality and methodological versatility. The scale has centrality, working as much as possible at the local and universal levels, crossed by other scales that can be fundamental for a deep understanding of the theme and the problem in question.

Another aspect to be highlighted is that the perspective of understanding thought as reality is not new. As an illustration, Bohm (1980) made an intriguing reflection on this issue, recognizing that thought is in motion, as occurs in the more general context of the universe. “[...] Mind and matter are not separate substances but rather different aspects of a total and uninterrupted movement” (BOHM, 1980, p. 32). Cosmos and consciousness are in unity and constant movement, as are particles *and* waves, emotion *and* reason, order *and* disorder, gases *and* dust, quantum mechanics *and* relativity, attraction *and* repulsion, collision *and* fusion, etc.

The thinking subject and his thoughts are not separate from the movement that sustains our lives. Therefore, it is not advisable to reproduce the traditional separation between the thinking observer and the thought “object”, as if the researcher were not part of the studied reality. Thus, that “modern” science in which bodies are separated into units and parts to reason about the whole, within the scope of hegemonic techno-science, is quite limited and insufficient (QUINTERO WEIR, 2021), together with the reduction of a fantastic complexity – of the universe – to mathematical equations. “However, on occasions when science evokes both reason and emotion, the result can be powerful” (GREENE, 2021, p. 26).

The Cartesian view of the world – we understand that reason cannot be reduced to Cartesianism – therefore needs to be overcome qualitatively and, to this end, according to Bohm (1980, p. 16), the theories of relativity and quantum are insufficient, although it is common to understand that we live in an “uninterrupted totality of the universe”. We, despite not being physicists or philosophers, believe that the quantum and relativity theories are not exclusive: one is in the other, as conceptions of the world complement each other, and as the micro is in the macro and the macro in the micro.

And one aspect that has greatly contributed and collaborates in breaking with the hegemony of Cartesian thought is precisely the understanding that particles and atoms can manifest themselves as waves, moving discontinuously in fields fused with each other, as Bohm (1980), Greene (2001, 2021), Tonelli (2021), Kaku (2023), Randall (2022) and Cox and Forshaw (2016) seem to recognize. We believe that quantum levels and connections are in universal relativity, and this affects the quantum movement of fluids and electromagnetic waves. “Although quantum

theory is very different from relativity, in a profound sense they have in common this implication of undivided totality” (BOHM, 1980, p. 182). The totality of flows and connections is implied in our quantum-relativistic-cosmological-sensitive daily life, that is, in thought-reality, in time-space, in the body-soul-energy-spirit-wave, etc.

By starting from the whole, in order to understand the parts, we reproduce the accommodation or adaptation of the researched reality to some theory, maintaining research models and the organization of scientific work. By starting from the parts towards the whole, we run the risk of getting lost on the inductive “path” and reproducing dichotomies that are very well known in different sciences, without achieving the necessary reflective depth.

If we look closely at the most brilliant and polished of surfaces, we soon come across the chaotic dance of the elementary components of matter that float, oscillate, interact and change nature at a frenetic pace (TONELLI, 2021, p. 33).

These spaces [between galaxies] are not completely empty. The hot, million-degree gas that surrounds each galaxy also fills the space between galaxies in a cluster, usually with a few protons and electrons in each bit of space (DUNKLEY, 2023 [2019], p. 142).

We believe that the macroscopic and microscopic levels are distinct, but not mutually exclusive; they occur simultaneously; they are together every second and millisecond, with chaos, regularities, order, in a mass-space-time-energy-waves. It is not a question, then, of dividing the whole into parts, starting from it or from the parts. It is a question of coexisting (horizontally) part-whole, particle-wave-flow-field, time-space, micro-macro, chaos-order, society-nature, gas-dust, concentration-deconcentration in a single and indivisible movement. We are not a part of the universe, we are the universe: or not?

Universe where space and time are inseparable, material substance that is here and there, vibrating, deforming, oscillating, contorting, expanding, with singularities in the macro and micro, relativistic and quantum dimensions, with bifurcations and intersections, collisions and disturbances, waves and particles, in short, with energy in motion (TONELLI, 2023).

This is why we believe that singularities do not occur only at the gravitational or quantum level; they are present here and there, near and far from us, including in our bodies, biologically and culturally. However, singularities are often “invisibilized”, along with the temporal, spatial and territorial (social-natural-cosmological) heterogeneity and coexistence that exists in our daily lives. Normally, singularities are neglected precisely by universalist and globalizing abstraction (SAQUET, 2022a), obscuring subtleties, ruptures, rhythms, sensitivities, etc.

Thus, we consider that our thinking cannot be limited to data processing and universal techniques (ZEMELMAN, 2011 [2005]). It seems vital to practice a sense-thinking⁶ worldview, turning to the “heart” of the Earth, interacting (“dialoguing”) with the world in favor of “buen con-vivir” (QUINTERO WEIR, 2021). “Being left or

⁶ In the original “sentipensante” (N.T).

right is not only a way of thinking, but also (perhaps above all) a way of feeling and living” (MEMMI, 2021 [1955-56], p. 63).

Therefore, thinking with the “heart” and feeling with the mind seems essential. “Corazonar” can be essential to inverting the North Eurocentric philosophy, contributing to making visible, recognizing and strengthening the wisdom of the native peoples, subverting the hegemonic order of science (PÉREZ MORENO, 2019). “In Aztec mythology, divine beings temporarily left their space-time and infiltrated everything on Earth, granting everything identities, energies and the powers to live and procreate” (CARRASCO, 2023, p. 101). Did they recognize the existence of quantum relativity? And what’s more, did the Aztecs also think about a quantum-gravitational theory?

When a man or animal died and was buried or cremated, their divine substances were released from their hard shell and returned to the underworld, where they awaited the next cycle of rebirth to enter once again the world of creatures as a new being of the same type (CARRASCO, 2023, p. 102).

[...] El corazón es el lugar donde se guardan las memorias, los dolores, las tristezas, los miedos, las alegrías, las esperanzas [...]. Esta sabiduría y cosmovisión del corazón permite entender que hay otras formas de vivir, actuar y sentir la vida, lo que nos rodea, el universo [...] (PÉREZ MORENO, 2019, p. 171-172).

More than this, we need to live and research differently, considering, every day, the inseparable unity between being and thought, between society and nature/cosmos, that is, our integration into nature and society through a worldview lived in praxis. There, at the level of everyday life and territorial rooting, we can collaborate much more in a decolonial, dialogical and participatory perspective with the inhabitants of our (con)viviality, integrating academic and popular knowledge to qualify a sensitive and versatile interpretation, increasingly coherent with our life (see details in Saquet, 2023b, 2024; SAQUET and CICHOSKI, 2022).

As I left the Palace of Justice to get into my car, I recognized for an instant the smell and color of the summer afternoon. In the darkness of my rolling prison, I found again, one by one, in the depths of my fatigue, all the familiar sounds of a city that I loved and of a certain hour when it occurred to me to be happy (CAMUS, 2020 [1942], p. 101).

Hence the possibility of risking some reflections on the method of coexistence, precisely to facilitate the understanding of this myriad of multidirectional and multilateral, transtemporal and trans-multiscalar phenomena and processes that we experience every day, often without realizing and thinking about the breath of the universe in our faces. In this way, we can simultaneously grasp the macro *and* the micro, the waves *and* the fields, the interactions *and* collisions, in short, the singular *and* the universal, on the horizon of the universal flow that is (im)material (SAQUET, 2020 [2007]).

Gravity and quantum reactions coexist; gravity devouring stars, fragmenting them at high speeds; reactions and explosions, attraction and repulsion; stars of different sizes, densities and ages; collapses and rebirths, death and life; regularity

and chaos; order and eruptions; black holes, common stars and neutron stars; galaxies also of different sizes and ages, with a lot of gas and dust, all connected by filaments, energy flows (TONELLI, 2021). “Galaxies and galaxy clusters are the bright lights in the skeleton of the universe, the dark matter network” (DUNKLEY, 2023 [2019], p. 225).

Perhaps these networks can be considered multidirectional and polycentric processes between stars-galaxies-clusters of galaxies-universe, an aspect that makes the universe itself, as well as our daily life, polycentric, articulated between “nodes”-networks-meshes that are perhaps endless. “On this broader scale, the universe appears as an intricate network of galactic superclusters that together contain about 100 billion galaxies.” (DUNKLEY, 2023 [2019], p. 74).

We can understand that, from subatomic particles to star explosions and galaxy formation, there are connections and energy in motion, with collisions and fusions, where everything is united, from gluons, by plasma-wave energy, in an immense symmetrical and asymmetrical field, concomitantly, connected and contorted by the “void” cut by cosmic radiation, in an ocean of dark matter and energy (KAKU, 2023).

It seems to us, therefore, in geographical language, that we live in a coexisting world of very many territorialities (relations, mutual influences...) and connections (networks, waves, filaments...), in a gigantic field (or mesh) of energies (particles-atoms-stars-galaxies...) that is perhaps infinite, where there are overlapping “nodes” (atoms, molecules, cells, stars, solar systems, galaxies; some may correspond to Greene's [2021] “regions of concentrated energy and order”) and networks of “nodes” (solar systems, particle-waves, clusters of galaxies... and, perhaps, of universes).

A “node” then assumes forms and meanings ranging from regular to irregular, on multiple scales (sizes), intensities and complexities, but always with the sense of introversion, encounter, concentration of spaces-times, simultaneously linked, integrated and integrating other diverse “nodes”, where there is, continually, annihilation-death and rebirth in the universal (or multiversal) network. This process is reproduced on Earth, in the society-nature or society-space-time relationship, where we can easily identify, understand, represent and explain the multiple, unequal and different relationships, temporalities and territorialities that we experience every day, in a trans-multiscale and transtemporal way, in a field of power and energy also with multiple networks and coexisting “nodes”.

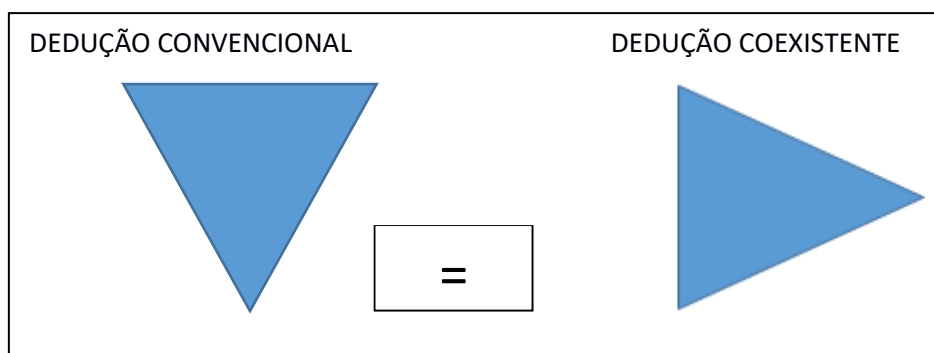
Thus, we understand that, more than in other periods, it is necessary to put our feet on the ground, in the outskirts, in the rivers and forests, in the rural settlements and “quilombos”, to attack the powerful and oppressors with arguments that are consistent in theory, methodology and politics, with viable proposals and cooperation, with our involvement and commitment to popular and environmental causes. More than ever, it is necessary to immerse ourselves in the territories, to live with our people, to try to learn from them, qualifying our sciences and interpretations of the known world. “Una reina, en la hora de su muerte, dice que es fuego y aire; yo suelo sentir que soy Tierra, cansada Tierra” (BORGES, 2005 [1995], p. 9).

Sensitivity conditions creativity, and this creativity influences sensitivity, sagacity, spontaneous creation, and the “openness” to learning new things, to

improving imagination, perception, and art (BOHM, 2011). This is where, in our understanding, sense-thinking⁷ conceptions of science become fundamental, linked to popular and original knowledge, theoretical and practical (simultaneously), universal, but also contextualized in each country, region, continent, municipality, etc. These sciences are made with the maximum possible political commitment to societies, as Fals Borda (2012 [1997]) warned and argued very well.

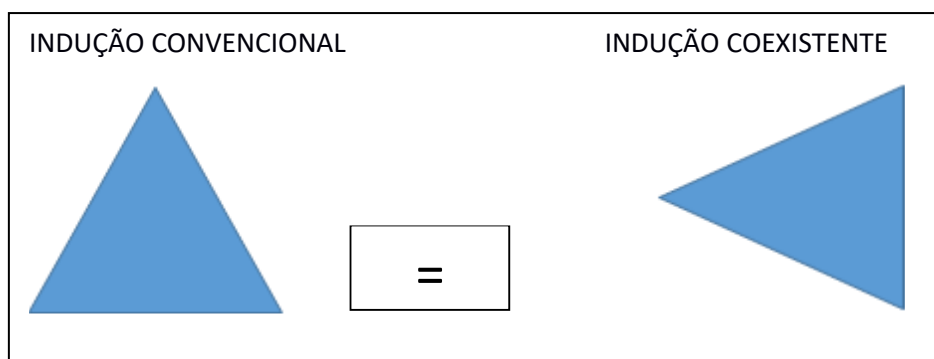
To do this, decolonization is necessary, and so we are trying to invert and subvert theories and methods, building the method of coexistence, through which we learn that it is necessary to dare and co-produce knowledge and solutions in favor of the lives of all. Thus, a movement that we consider fundamental, as it was and is in our participatory- action-research projects, is the inversion of what is normally understood as deduction (Figure 1) and induction (Figure 2), together with the category of totality, which also needs to be horizontalized.

Figure 1 – Our inverted option of deduction in favor of coexistences.



Source: Saquet, 2023b. (Conventional deduction and Coexisting deduction).

Figure 2 – Our inverted option of induction in favor of coexistences.



Source: Saquet, 2023b. (Conventional induction and Coexisting induction).

By inverting, “lying down” (placing horizontally) the traditional triangles that represent deduction and induction, we have the possibility of multi-directing the research, carrying it out in historical phases of qualitative research (bibliographic-documentary research-secondary data-empirical research-analysis, in a transtemporal perspective) and simultaneous activities (bibliographic and empirical

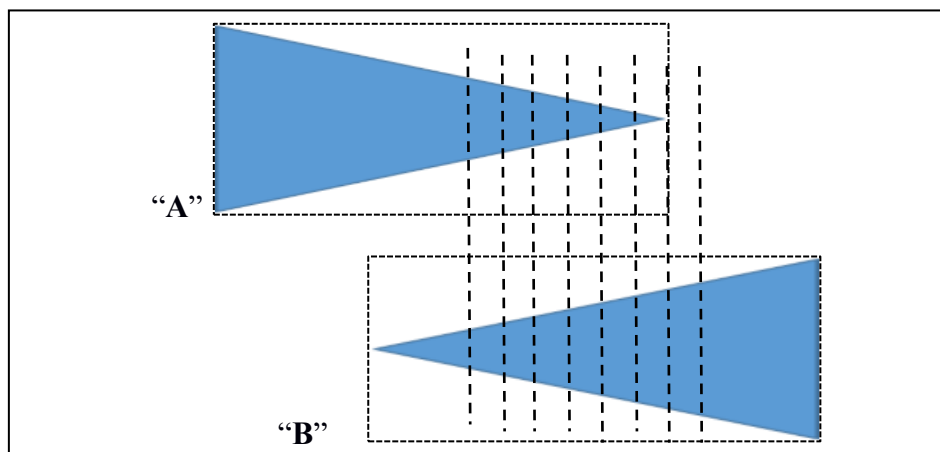
⁷ “Sentipensantes” in the original (N.T).

research, simultaneously; documentary research and social cartography, concomitantly, etc.), in a trans-multiscalar manner.

This approach has proven to be slow and challenging, but it has facilitated the necessary dialogue between theory and empiricism, articulating different scales of analysis, always from a critical and applied perspective that does not disregard quantitative research (this obviously depends on each research project and/or action). To achieve this, we need to drastically break with the theoretical and methodological models that we have historically taught and learned in Westernized universities, theories and methods that are crystallized in our minds and daily investigative practices.

By superimposing our inverted options of deduction and induction, we have the coexistence of both, i.e., we can begin the research process through deduction “A” (theoretical-conceptual research, for example) that, little by little, will coexist with induction “B”, based on the collection, processing and analysis of primary data. Thus, we will return to the most general level of reflection on the theme and problematic of studies (Figure 3), combining general research with specific research, being able to move from a quantitative level to a qualitative and cooperative one.

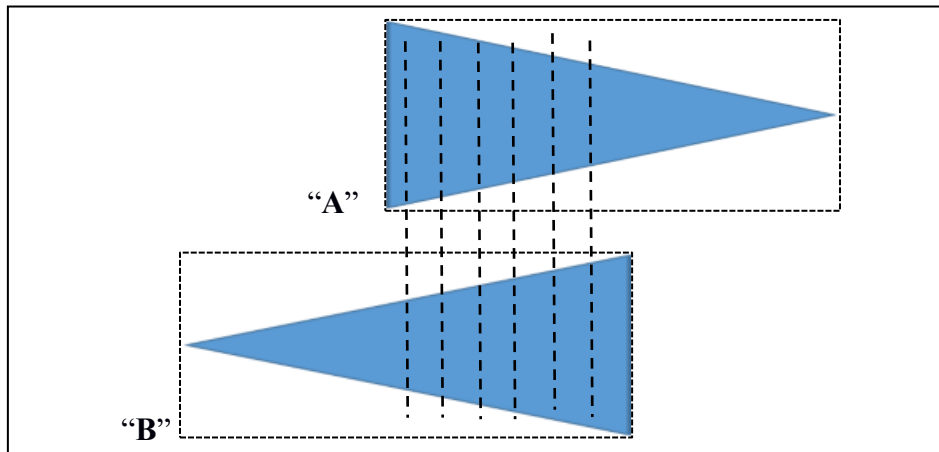
Figure 3 –Representation of a quanti-qualitative option.



Source: Saquet, 2023b.

In a distinct procedure, always overlapping our inverted options of deduction and induction, we can begin the research process through induction “B” (primary data) that will gradually coexist with deduction “A”, based on the collection, processing and analysis of secondary data and/or bibliographic and documentary research. Thus, we will return to the singular level of reflection on the theme and problem of studies (Figure 4), combining multiple scales of analysis in qualitative research, moving on to quantitative, up to the necessary qualitative interpretation with the depth, coexistence and cooperation specific to each project. It is not, therefore, a question of deducing or inducing; both procedures need to be simultaneous, with versatility, horizontality and sensitivity.

Figure 4 – Representation of a quali-quantitative option.



Source: Saquet, 2023b.

This means that the starting “point” is not essential. It can be the micro, it can be the macro, relativity or quantum mechanics, the singular or the universal, an individual or a social class, but all of this needs to be, at some point, brought together and reflected upon, to be understood in a transtemporal, trans-multiscalar and transterritorial way.

The main thing is the trajectory of the research and/or action carried out, in accordance with the objectives, goals, schedule, available resources, etc. of each project. This may be obvious to many, but with versatility and the necessary caution, we can and must co-create different methods. Our bodies are earth and water, atoms and particles, cells and molecules, thoughts and emotions, waves and curves, needs and desires, Earth and universe, connections and fusions, and this is very clear, although it is all very difficult to understand. Thus, knowing that the Earth is an inalienable common good, because the life of one depends on the life of others, it is increasingly vital to take care of everyone, every day, minute and second, contributing to breaking with economic globalization and degrading colonialism (SHIVA, 2006).

3 Some very temporary considerations

There are several indications of complementarity between different worldviews, combining in the explanation of the universe and, of course, of known life, from some premises of the original peoples, through “modern” science, to the possibility of a (im)material, theoretical-practical, sensitive, horizontal, transtemporal, trans-multiscale and transterritorial conception. Here we are, as a result of billions of connections, filaments, collisions, eruptions, waves, particles, movements, energies, curves, forces, changes, permanences that are in the resurrection of the flesh and of thought as a tiny portion of an indivisible and, perhaps, endless universe.

In our bodies are that mass and energy of universal beginnings that are incessantly renewed through the energy flows of the collapse and rebirth of each

body! “The past and the future meet and mingle in an ill-defined present” (WHITEHEAD, 2019 [1919], p. 86). The past is the future and the present! What is past for some bodies – including ours – is present and future for others! The present, therefore, is ephemeral, but it is “eternalized” in the past and the future! What’s more, perhaps our bodies contain many keys to reading and understanding the known world, as Greene (2021) has coherently pointed out.

Life is transmitted between different beings, it moves in time-space-territory, it transforms from body to body; through atoms, through DNA (which contains our identity of millions of years). Life unfolds, metamorphoses, reincarnates, and results from the interaction between coexisting and preceding beings (who also coexisted), therefore, from historical-relational beings. Life is the “flesh of the world”, with body and soul-energy-waves, or, the “flesh of the earth and the light of the sun”: we are the repetition of previous lives, a kind of more recent version, struggling to live (COCCIA, 2022).

In this sense, our learning has clearly revealed that critical self-awareness applied to problem-solving is vital for the population of a certain territory, at a certain time. In fact, self-awareness is coherently evidenced by Fanon (2009 [1952]), when he affirms the need for the colonized to free themselves from themselves, from masks, from alienation, from the coloniality rooted in our minds and daily actions.

Self-awareness also recognized by Memmi (1991 [1957]), relating it to the struggle for emancipation and political-cultural autonomy. This is a condition for a conscious life in relation to what we do and live every day, with decision-making autonomy and liberation from oppression and dependence, perhaps experiencing an effective “dialectic of liberation” (FANON, 1974) for everyone⁸, in all places and territories on this planet. Decolonization means detachment from subjection to think and act beyond the categories of “modernity” or “postmodernity”, based on the co-production of knowledge, recognizing the other as a thinker (LEYVA and SPEED, 2008).

This perception must be free from conditioning to existing patterns or it will naturally be just an extension of a mechanical reaction. It must be new and different, creative and original (BOHM, 2011, p. 69; emphasis in the original).

A struggle that seems to have accompanied the universe since its genesis – although with very different meanings considering the great domains of nature and society – between different particles, gravity and electromagnetism, in the depths of each atom and star, as well as present in the territorial formation of Latin America and the other peoples of this planet. It is not about naturalizing society, nor about socializing nature; in fact, we believe that we need to overcome preconceptions and premises considered absolute that normally separate everything and everyone.

So, we are working to co-produce knowledge, as it is a very powerful process that is appropriate for popular and sustainable daily life. We put a lot of effort into the classroom, in neighborhoods, in rural establishments and in institutions of social movements of territorial praxis, working on the integration of theory-practice-theory

⁸ In the original: “[...] todos e todas” (N.T).

or practice-theory-practice, involving, in each project, at least some inhabitants of each place, in the research and in the actions carried out. In this way, we believe that we are contributing to the struggle and demands, i.e., to territorial management through communication and cooperation that we consider popular, respectful and dialogical, strengthening the organizational capacity of each urban and/or rural community, taking care of our lives and the lives of others.

Perhaps, in this way, we will be able to co-create knowledge that is increasingly useful for all people, co-producing solutions in an intergenerational, intergender, intercultural, transtemporal, trans-multiscale and transterritorial manner. An effectively decolonial and counter-hegemonic paradigm necessarily requires the co-production of knowledge and direct collaboration to solve common problems, in a theoretically, methodologically and ideologically-politically in(sub)versive movement. To build this other paradigm, we still have a long way to go, but we have learned that it is necessary to decolonize our minds (unlearn) and actions by relearning through reflection-action-coexistence, with social immersion, territorial anchoring, trust and political commitment, sensitivity and versatility.

In short, many questions and issues remain without clear answers, at least for a geographer like me. That is why we continue to research and collaborate, teach and learn. Why are our human bodies hot? Why do we not perceive the rapid movement of the solar system orbiting the center of the Via Lactea every day? Are mathematical equations the only way to “validate” our knowledge about the cosmos? And doesn’t our brain, with its billions of neurons, connections and filaments, help us understand the universe? Did God roll some dice?

Is there, in fact, a need for other research practices, as we have indicated here? Are certainties and uncertainties, symmetries and disturbances not part of our daily lives, including our thinking? Are not the cosmos and thought simultaneously concrete-abstract, material-immaterial, objective-subjective? Is there no quantum gravity or a quantum-gravitational world that can be felt and understood with and without equations? Well, perhaps the native peoples have much to teach us. Furthermore, it is possible that not everything can be measured and mathematized, nor even felt and perceived by our “heart”-brain.

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