

Transdisciplinarity: Basarab Nicolescu Talks with Russ Volckmann

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He is the President and founder of the International Center for Transdisciplinary Research and Studies (CIRET), a non-profit organization with 163 members from 26 countries. He is the co-founder, with René Berger, of the Study Group on Transdisciplinarity at UNESCO (1992) and the founder and Director of the "Transdisciplinarity" Series, Rocher Editions, Monaco, and of the "Romanians of Paris", OXUS Editions, Paris.

He is also a specialist in the theory of elementary particles and is the author of more than one hundred thirty articles in leading international scientific journals, has made numerous contributions to science anthologies and participated in several dozen French radio and multimedia documentaries on science.

Basarab Nicolescu is a major advocate of the transdisciplinary reconciliation between science and the humanities. He has published many articles on the role of science in contemporary culture in journals in France, Romania, Italy, United Kingdom, Brazil, Argentina, Japan and in the USA.

Adapted from Wikipedia,

http://en.wikipedia.org/wiki/Basarab_Nicolescu#Biographical_profile

Introduction

There seems to me to be a natural harmony between transdisciplinary and integral approaches to, well, just about everything! Integral Review embraces work in transdisciplinary, developmental and integral approaches in its pages. What more appropriate than an interview with the man, more than any other I know, who has fostered an international transdisciplinary approach from his distinguished position as a leading contributor to theoretical physics.

CIRET (Le Centre International de Recherches et Études Transdisciplinaires) <http://nicol.club.fr/ciret/index.htm> (from their website) "is a non-profit organization, located in Paris and founded in 1987. The aim of our organization is to develop research in a new scientific and cultural approach - the transdisciplinarity - whose aim is to lay bare the nature and characteristics of the flow of information circulating between the various branches of knowledge. The CIRET is a privileged meeting-place for specialists from the different sciences and for those from other domains of activity, especially educators."

One can find a wealth of links to transdisciplinary publications, many of them related to the interface of science and human systems, including public policy, health, sustainability and ecology. Of particular interest is Basarab's publication, Manifesto of Transdisciplinarity (tr. Karen-Claire Voss. Albany, NY, USA: State University of New York Press, 2002). The Charter of Transdisciplinarity can be found at the end of this interview. Translations of excerpts of the

*manifesto, itself, into several languages can be found on the CIRET website. In addition, two papers, Gödelian Aspects of Nature and Knowledge (Translated from French by Karen-Claire Voss ; published in *Systems : New Paradigms for the Human Sciences* , edited by G. Altmann and W. Koch, de Gruyter Verlag, Berlin-New York, 1998, pp. 385-403), <http://nicol.club.fr/ciret/bulletin/b12/b12c3.htm#note>, and *The Transdisciplinary Evolution of the University Condition for Sustainable Development*, <http://nicol.club.fr/ciret/bulletin/b12/b12c8.htm#note> were particularly useful in preparing for this interview.*

I recognize that what we covered in this conversation does little more than open the door to the subject of transdisciplinarity and its application in a wide range of human activity. I hope, one day, to have the opportunity to do a follow-up of this interview and to continue the conversation with this most gracious man who has made such significant contributions to us all.

Russ: *Your background is in a discipline, in Physics.*

Basarab: Yes. I am a practitioner of theoretical physics, elementary particle physics. I have been doing that since 1965, when I finished my university studies, and I am still active.

Q: *You hold positions in both Paris and Romania, is that correct?*

A: That's right. In Paris I am at the National Center for Scientific Research, the laboratory is based at the University of Paris 6 "Pierre and Marie Curie," and I am also professor at the Babes-Bolyai University, in Cluj, which is in Transilvania. It's one of the best universities in Romania and Central Europe.

Q: *Could you explain how you went from working in quantum theory and subatomic particle physics to transdisciplinarity?*

A: The transition was very natural in that I was always fascinated by understanding things—not only learning, producing and, reproducing, but understanding. What I mean by understand is to connect knowledge and being. I discovered slowly that the questions that I had as a quantum physicist were shared by the big founders of quantum physics, like Werner Heisenberg, Wolfgang Pauli and Niels Bohr. These are the three names that had the biggest influence on me. I discovered that for them metaphysics and physics went together, to my surprise.

In my time, in our modern time, things are very different. The splitting of perspectives is very big. These people, like others who were the founders, were extremely cultivated people in philosophy, literature, art, poetry. They even had serious knowledge in philosophy. I was glad to slowly discover in 1975-1976, when I was in Berkeley as a post-doc, they had already discussed the question that had obsessed me.

Niels Bohr had his own program, besides physics, to explain the principle of complementarity in physics and in many other fields like psychology, politics and social life. He spent a lot of time giving talks and writing on this subject. Wolfgang Pauli was a very different person, but also extremely connected with metaphysics. He was very knowledgeable in alchemy and had very serious interactions with Carl Gustav Jung. In

fact, Pauli was a patient of Jung when he was young and they began a collaboration and a friendship.

However, the person who most influenced me is Werner Heisenberg. I very much appreciate his writing, *Philosophy: The Manuscript of 1942*, which was published only forty years later in German. To my knowledge, there is no translation in English, but a very good translation in French. I discovered that a lot of things I did myself in transdisciplinarity, like levels of reality, he had already thought about and elaborated with very transdisciplinary notions.

Kurt Godel is also an incredible figure, not only for his theorems of incompleteness, which I was extremely interested in—I read them, and even understood and worked on them—but also for his many other writings and for his less-known side as metaphysician, especially in his correspondence. I am studying the letters which he addressed to his mother in which he developed original thinking about death, meaning of life, about Trinity and about God. He had even a theorem on God's existence, a serious, mathematical theorem which is less known, of course, than the other theorems.

But I was also influenced by philosophers in my way from quantum physics to transdisciplinarity. One of the people that influenced me was Jacob Boehme, about whom I wrote a book entitled, *Science, Meaning and Evolution: The Cosmology of Jacob Boehme*. He was a contemporary of Galileo Galilei's. I wrote this book and it was published in New York with an English translation. This man came from a different stance than Galileo. Galileo was the mark of break between the thinking of the Middle Age and the Renaissance. He was one of the founders, if not *the* founder, of modern physics. But he took the way of splitting culture and science, inventing the role of the universal language called mathematics.

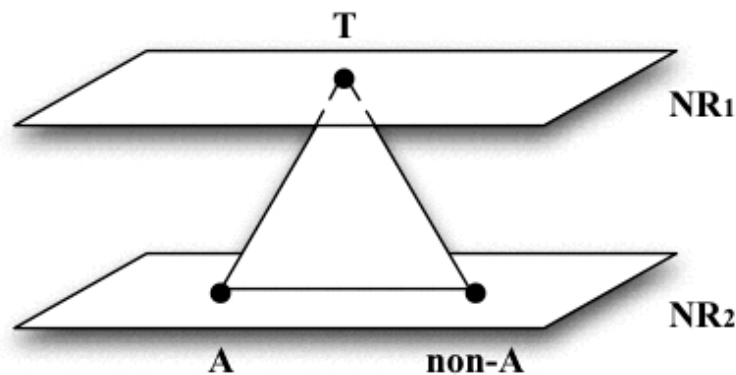
Jacob Boehme went another way, which was not followed by scientists and which was connected with religion. He was a religious man, a Protestant from Bavaria, and he is considered the first German philosopher. Hegel considered him as being his master. He did a lot of extraordinary, interesting and original thinking about complexity in our modern world—about complexity, but connected with our internal life and life of mind and spirit and the external world. He elaborated on a kind of formalism, as form and structure, to discuss the most complicated things we can imagine.

Another person is a contemporary—Stephan Lupasco—who is of Romanian origin but lived in France. He left Romania very early at the age of 16 and became one of the most interesting French philosophers. I became interested in him when I came from Romania, because he had the strange idea of renewing philosophy through quantum physics. Even Bohr, Heisenberg and Pauli didn't go so far as to transform philosophy, not in terms of physics, but based upon ideas, general ideas, which came from the physics of the 20th century and, in particular, quantum physics. Lupasco took most seriously into account paradoxical features of quantum physics concerning reality and he was a great inventor because he proposed a new logic, called the logic of the included middle.

The Logic of the Excluded Middle

1. *The axiom of identity: A is A.*
2. *The axiom of non-contradiction: A is not non-A.*
3. *The axiom of the excluded middle: There exists no third term T which is at the same time A and non-A.*

The Included Middle



The logic of the **included middle** is capable of describing the coherence among these levels of Reality by an iterative process defined by the following stages: (1) A pair of contradictories (A_0 , non- A_0) situated at a certain level NR_0 of Reality is unified by a T_1 -state situated at a contiguous level NR_1 of Reality; (2) In turn, this T_1 -state is linked to a couple of contradictories (A_1 , non- A_1), situated at its own level; (3) The pair of contradictories (A_1 , non- A_1) is, in its turn, unified by a T_2 -state situated at a third level NR_2 of Reality, immediately contiguous to the level NR_1 where the ternary (A_1 , non- A_1 , T_1) is found. The iterative process continues to indefinitely until all the levels of Reality, known or conceivable, are exhausted.

In other words, the action of the logic of the **included middle** on the different levels of Reality induces an open structure of the unity of levels of Reality. This structure has considerable consequences for the theory of knowledge because it implies the impossibility of a self-enclosed complete theory. Knowledge is forever *open*.

- Basarab Nicolescu

Q: That is a very rich history that you have placed before us. Would you contrast transdisciplinarity with the disciplinary, multidisciplinary and interdisciplinary approaches?

A: Yes. This is very important to clarify from the beginning because these are words, which, even now—many years after transdisciplinarity was introduced—are confused.

In very schematic words, what is it all about?

The starting point is the incredible multiplication of the number of specialized disciplines with time. When the very first universities were founded around the 13th century, we had seven disciplines, which were called *trivium* and *quadrivium*, corresponding more or less to what we call today Exact Sciences and Human Sciences. In 1950, we already had 54 disciplines. It began increasing very fast. In the year 2000 we had more than 8,000 disciplines. These numbers are coming from a very serious poll made by the National Science Foundation. Many of these are taught in American universities. 8,000 disciplines means 8,000 ways to look for reality. It means a catastrophe for knowledge in some sense, because it means there is no more unity of knowledge. Because of that, after 1950, words like multidisciplinary and interdisciplinary were very current as a need to reunify and reconnect in the present situation.

In fact, multidisciplinary was always there, from the founding of universities. What means multidisciplinary? It means I take an object from a given discipline, say a painting by Giotto. I can study it as an object of the history of art; I can study it from the point of view from the history of Europe, from psychoanalysis, chemistry or physics and so on. Throughout my investigation, I am returning to the initial discipline, which is the history of art in our example. Multi-disciplinarity is studying an object from a given discipline with ideas you have from other disciplines, but it remains in a disciplinary context.

Interdisciplinary is completely different. The word became fashionable around 1950. Especially in the U.S. there was a huge development of interdisciplinary thought even inside universities. We have interdisciplinary departments now. The idea was the transfer of methods from one discipline to another. Let me give you a famous example. You study very different phenomena, like how clouds develop and the evolution of stock market actions. You transfer, in this study, methods from mathematical physics and you get a new discipline called Chaos Theory. It is how Chaos Theory appeared—from the transfer of ideas from mathematical physics to the study of meteorology and of stock market actions.

We have here the transfer of methods, but we have also the disciplinary way of dealing with this new kind of knowledge we acquire. Interdisciplinarity still situates in the frame of disciplinarity. More than that, one can give birth to new disciplines, like quantum cosmology. There are many other examples. It's disciplinarity, but extended disciplinarity.

Transdisciplinarity is radically different. It doesn't mean that it's better or hierarchically higher; I don't make hierarchies. I'm speaking about distinctions. Transdisciplinarity is completely different in the sense that it puts the problem of the information that circulates in between disciplines, across disciplines, and even beyond any discipline. The sketch I'm giving is not really a definition, it's just the etymology of

the word. “Trans” is a Latin word meaning at the same time, in between, across, and beyond.

If you don’t have the meaning “beyond disciplines”, then transdisciplinarity is no more than a variant of interdisciplinary, due to the fluctuation of disciplinary frontiers. But because it is *beyond* any disciplines, transdisciplinarity is radically different from all the others.

It’s no mystery. What is beyond any discipline? It is, of course, ourselves, the human being. In more sophisticated words, we can say that what is beyond is the Subject. The Subject cannot be captured through formalism. When you want to capture it, it’s an ontological catastrophe, because the Subject is transformed in Object. Transdisciplinarity is coming back to knowledge of the Subject, more precisely of the interaction between the Subject and the Object.

The word “transdisciplinarity” itself is relatively new. The philosopher and psychologist Jean Piaget, who is Swiss, invented this word in 1970 at the Organization for Economic Cooperation and Development (OECD) Congress in Nice, France. The subject of the Congress was methods of teaching in universities. Piaget was very familiar with the psychology of children. It is very important that this started with observing the needs of the children. Piaget talked about fluctuation of disciplinary frontiers and he guessed that from this fluctuation of boundaries, new kind of knowledge is generated. He introduced the name transdisciplinarity for that. From the time when Piaget introduced the word, thinkers like Erich Jantsch, Edgar Morin, Ludwig von Bertalanffy also became interested. Transdisciplinarity was, however, in a kind of sleep for many years, because nobody really succeeded in capturing what this was really about—*beyond the disciplines*.

Here I came, with all my modesty, in 1985 when I published my first book in France. I had published another book in Romania before leaving in 1968. In France, I published a book called *Nous, la Particule et le Monde*. It is a book about quantum physics and the epistemological and philosophical implications of quantum physics, about the thinking of the founders about what reality means. What motivated me the most was that I was puzzled by the fact that the two big intellectual constructions of the 20th century, which are the theory of relativity and quantum mechanics, could not be joined together, could not be reconciled.

The situation is the same today. It was kind of rupture, a discontinuity. So I tried to understand that. In this framework, I must say that a very big role in my evolution of thinking was my stay at the Lawrence-Berkeley Laboratory, where I spent one year working with Geoffrey Chew, the founder of the Bootstrap Theory. We even produced papers together and we had lots of meetings about the philosophy of physics.

At that moment, Fritjof Capra was there in Berkeley, and he wrote the bestseller, *The Tao of Physics*. I did not agree with the content of this book. I thought *The Tao of Physics* was a very useful book, because for the first time the problem of philosophical and metaphysical implications of quantum physics were shared with the public. But I did not agree, because Capra replaced all the content of quantum physics, in a kind of analogical game, within the philosophy from the East: Chinese, Buddhist, Taoist.

I knew from my own practice with physics and my knowledge of philosophy that, in fact, modern science appeared here in Europe. Galileo Galilei, Newton and Kepler were from Europe. Why from Europe was the big question, which Joseph Needham, the

philosopher of science, tried to answer. Why didn't modern science appear in China where they have fabulous thinking and fabulous science?

My idea, and this is why I wrote the book on Jacob Boehme, was in fact that the Christian way of thinking, with making distinctions and with the idea that this world is here for us to take advantage of and to dominate, was the background of modern science. Europeans were able to think about nature, a fact that China refused to do. China refused to cut things, to cut slices of reality. European thinking, founded on Christian religion, adopted the method of slicing reality. We saw emerging the idea that by slicing reality with mathematical methods we will generate the process of understanding all reality. I discovered later that Hans-Georg Gadamer had the same view on the European origin of modern science.

That is why I was in disagreement with Capra, but the disagreement was productive, because we had a lot of discussions with Chew and with many others there and this stimulated me a lot. It was in Berkeley, in fact, that I had the idea that initiated the new way of transdisciplinarity in 1985—the idea of levels of reality. This is a little bit of background.

Aspects of Nature

1. Objective Nature, which is connected with the natural properties of the transdisciplinary Object; objective Nature is subject to subjective objectivity.

2. Subjective Nature, which is connected with the natural properties of the transdisciplinary Subject; subjective Nature is subject to objective subjectivity.

3. Trans-Nature, which is connected with a similarity in Nature—a veritable communion—that exists between the transdisciplinary Object and the transdisciplinary Subject.

- Basarab Nicolescu

Q: In what way would you say transdisciplinarity is a metatheory and in what way would you say it's more an attitude, a vision, and a practice?

*A: It's very difficult to say that transdisciplinarity is one thing or another before giving its definition. Transdisciplinarity took long years to formulate, but the methodology of transdisciplinarity was already present in my book I just quoted, *Us, the Particle and the World*, which is not yet translated in English. In this book, I identified three axioms, which are now considered by many researchers around the world as defining transdisciplinarity.*

Reality

"By 'level of Reality,' (with a capital R) we intend first of all to designate that which resists our experiences, representations, descriptions, images, or mathematical formulations."

- Basarab Nicolescu

The first axiom is the *existence of levels of reality*. We have to define what levels of reality means. Let's say, in first approximation, that the laws of quantum physics correspond to a new level of reality in total discontinuity with the laws of nature we knew at the level of our own scale, where Newtonian physics is valid. Newtonian, or classical, physics is applied essentially at our scale of centimeters, seconds, and so on, with extension to planets and cosmic things, towards the infinitely long and infinitely big, like we say.

Quantum physics goes the other direction: infinitely small and infinitely short—extremely small distances and extremely short intervals of time. And there, to our surprise, we discovered laws that cannot reduce to classical physics. That's the core of all understanding of this revolution. It is the fact that one cannot reduce the quantum laws to the classical laws. We cannot have continuous passage from one to the other. That's the reason why, in fact, quantum physics and the relativity theory are, in logical terms, a contradiction. It doesn't mean they contradict facts—they are all perfect for their realm of reality. But it's a very defined realm— and that's the point.

In a given region of reality, classical physics is perfect. But if you extend this region, classical physics is working no more, and you discover new laws, which are in discontinuity with the laws of our own scale. That's more or less how I define levels of reality. If you have levels of reality outside, in the world, in the Object, like philosophers say, we have to have levels of reality in the observer, in who observes this reality. Otherwise, the observer will not understand reality. For example, suppose you are a lover of poetry, and you love a French poet like Lamartine, a classical poet. Anyone can understand his poems. If you want to understand the poems by Mallarme, for example, a big hermetical poet, it's very difficult. You have to have something like new sense organs inside of you to understand that. It's exactly the same with quantum and classical physics.

There are levels in ourselves, in our own understanding, representation, languages and so on, and even levels of reality of the Subject. I must add here to the names which influenced me, the name of the big German philosopher, Edmund Husserl. He elaborated the transcendental phenomenology, which is an important way of approaching reality and philosophy. Husserl was a mathematician, which is why I was attracted to him. He was the master of Heidegger. Husserl didn't call them levels of reality, but he spoke about these different levels in us, in the Subject.

So, I presented to you till now the first axiom, the ontological axiom of transdisciplinarity. "Ontological" in the sense that it's an axiom about being. Being of the world, and being of ourselves, of the observer, and of the Object—being of the Subject, being of the Object and being of reality. Now, in order to go from one level of reality to

another, it's absolutely clear that our usual logic—classical logic, which was invented by Aristotle and which identified the rules of understanding, of our propositions, of our assertions, of our language—would not work. It's very clear that if you judge reality in terms of “yes” and “no”, “yes” is right and “no” is wrong. This logic is not valid in quantum physics. That's one of the big surprises.

The usual logic is not compatible with what we see in nature, in the sense that in quantum physics there is a basic feature, which is called the Principle of Superposition. That means that if you have a physical state, which is compatible with physical laws, and you have another state, which is also compatible, you take a combination of the two and this is also compatible. This is expressed by the famous paradox of Schrödinger's cat. In quantum physics, you have a cat that is dead and alive at the same time. You put it in a cage, you put poison nearby, and if the cat is hungry, it will eat the food with poison and will die. If she is clever, she will not eat and will remain alive.

In our world, the cat will be alive or dead. In the quantum world, the superposition is dead and alive at the same time. The Principle of Superposition is the origin of all that is called paradoxes in quantum physics. The big founders like von Neumann and Birkhoff felt from the beginning that there was something fishy about logic and quantum reality. They tried to invent new logics—quantum logics. It was an extraordinary opportunity in the history of culture.

There are mysterious things happening in culture in the sense that in different fields of science and culture, the same basic ideas appear in forms that are very different. For example, Planck discovered quantum physics in December 1900. In the same year, abstract art was founded by Hans Arp. This coincidence is about translating this discovery of reality, which can have different facets in different fields. I say that because logics were believed to be universal, inherent, in some sense, to our own mind, to our neurons. Natural. Nobody thought of other kinds of logics than classical logic. It happened that at the beginning of the 20th century, a great number of non-classical logics began to be formulated—formal logics, axiomatic logics. And Gödel came with his famous theorems. I say that because quantum logic is a basic axiom in transdisciplinarity, namely the included middle logic, which is one variant of this non-classical logic.

What does it mean in simple words without going into technical details? For a normal mind, you cannot say yes and no at the same time, or there is something strange with your way of thinking. But you can have yes and no at the same time if you have at least two different levels of reality. That's a basic fact that I demonstrated in 1985 in the book *Nous, la Particule et le Monde*, and it was a simple solution to all these puzzles of paradoxes. If we are located on a given level with our mind, our representations, our images, we will discover in our formalizations, located on a different level of reality, as a couple of oppositions, yes and no. On our own level, our representations appear as approximations, as sections or projections of something much richer, which are submitted to more general laws. This is the second axiom of transdisciplinarity: In order to go to complex phenomena, you need a non-classical logic, and the best candidate is this included middle logic.

The third axiom of transdisciplinarity is the axiom of complexity. There are many theories of complexity. I noted myself at the Congress in 1992 at the Pontifical Academy of Science, consecrated to complexity in sciences, that no less than 32 different definitions of complexity were given. Most of these variants are not compatible with the

existing levels of reality. One of the compatible variants is the one of Edgar Morin. This is in connection with general systems theory, a systemic approach.

From the point of view of transdisciplinarity what we need is complexity, understood as the fact that every level of reality is what it is because it's connected with all the other levels of reality. Reality has a complex structure. Complexity, in this form, is no more or no less than the very old Principle of Universal Interdependence.

If you take these three axioms, which parallel the three axioms of modern science, you get the definition of transdisciplinarity. But this means that we define transdisciplinarity not via a new discipline, but via a new methodology. In other words, we identify transdisciplinarity not with a new discipline, but with a new knowledge—knowledge about what is in between, across and beyond disciplines. For this new knowledge, you need these three axioms—perhaps you need more. I don't know but, for the moment, we need only three. The first time I formulated these three axioms was in 1985 in my book *Nous, la Particule et le Monde*, ten years before the *Manifesto of Transdisciplinarity*.

If you take the three axioms, for the first time you can understand these realms of reality which involves the Subject and involves all of the different aspects of us. This means the individual level and also the social level. We talk about knowledge, which is not neutral. Disciplinary and academic knowledge is by definition neutral, with no values. You are not allowed to introduce values into scientific knowledge. However, transdisciplinarity is not neutral, and involves values, namely humanistic values, which are generated by the interaction of these three axioms.

Q: You use a definition of reality that includes the concept of resistance. Can you clarify that?

A: I apply what every scientist applies. In our scientific world, we know that there is something which resists. It doesn't matter what we call it, whether it's nature or laws of nature—there is something inside and outside of us that resists our sense organs. That's how science began: just touching things, looking around and so on. After that, the human being invented the extension of sense organs through instruments of measure. He was thus able to explore the frontiers of nature and reality.

There is a resistance in the sense that in science, for example, we discover new things all the time. From where do we discover? It is not from our mind. It is not from our will. It is because something resists there, outside of our instruments and our sense organs. But it is more than that. There is resistance connected with representations. If I take a tennis ball and say it is a square, this means that I might have slight problems with my mind and I will have to consult a psychiatrist! I must agree that the ball is a sphere. It is true that the ball is a sphere comes from the agreement of the community, but the agreement is connected with the resistance of the fact that every time I have a tennis ball, it is a sphere, not a square.

So there is resistance to images, descriptions and even mathematical formalizations. For example, in more than 40 years of practicing quantum physics, I saw a lot of beautiful theories that disappeared. Why? They were beautiful on a mathematical level, but they were in contradiction with basic facts. It takes only one basic fact to destroy the most beautiful theories—why? Because there was resistance, even in mathematical formalizations. So resistance is a kind of bread we eat every day. Without resistance, we

wouldn't discover things. Nature looks like an infinite reservoir of resistance. Is this clear?

Q: Yes, it is. If there weren't some kind of resistance, we wouldn't even notice it.

A: Yes. It is important also to distinguish two facts before finishing with the problem of resistance. There is one aspect that is connected with an agreement in a human community. That's the pragmatic part of this resistance. There is also an ontological side that I want to underline, a transpersonal aspect of reality. Even if we agree on something, a small thing appears which destroys our agreement. So, it is transpersonal trans-agreement, beyond agreement. It is not true what some philosophers belonging to some extremely relativist currents are saying that all is a social construction. Some philosophers say that even science is a social construction. Yes, it's a social construction, but not just that. And we capture in transdisciplinarity that this nature, this reality, is the outcome of a kind of agreement inside a community, but it's not only that. We capture also the action of the third, of the interaction term between the Subject and Object.

Q: Will you clarify the concept of the third?

A: I prefer to call it the hidden third. Why hidden?

Our modernity—what we call modernity in academic terms—appeared via a split between the Subject and Object. We say there is an Object, there is a Subject that observes it, and in between there is nothing else. That's the basis of what we call classic reality.

I ask you, "What is the object of transdisciplinarity?" and I say that this question has no meaning in the framework in which the knowledge is not about an object, but it's about the interaction between the Subject and the Object. Subject comes back. At the beginning of our interview, I said the Subject comes back via this interaction term between the Subject and the Object, which mediates the interaction between the Subject and the Object. But it's a zone of reality in which there are no levels. No resistance. It's a non-resistant region in reality which is there. We don't know much about it. We know it's rational because we say it is there, but if we want to say what it is, we don't know. We cannot make theories about this third; we cannot make models about it. We know it must be there.

I told you about my fascination with Heisenberg. Many years after I had these ideas and put them in print, I discovered that he had had similar ideas. Originality is not necessarily important. It's nice when you have confluence with other thinkers. In quantum physics, we observe this strange thing: when a given object comes into observation, the rules change, laws change. Why? Because the Subject, by definition, means interaction of our natural scale with a scale which is not at all natural—not in the visible nature. It's in nature, but much deeper. But this confrontation doesn't mean that the subject modifies reality. It is not that. It's that the subject, by its very presence, puts different scales into confrontation. This hidden third is there to mediate. This is the new aspect of what we can call transmodernity. This means we have this third, which means three components of reality: Subject, Object and the interaction term. There are philosophers who taught in this way, like Husserl, Cassirer, Heidegger, Gadamer. They

have these ideas of a different kind of metaphysics than the classical metaphysics. So, transdisciplinarity is a new form of knowledge, which is not in contradiction with other realms of knowledge, but it takes on general features from different realms of reality and that is all.

Q: If we're talking about Subject, Object and a mediating factor, the mediating factor is a realm of knowledge that has been neglected historically but which has rich potential in terms of shifting from a material level of analysis to one that is far more dynamic and process-oriented. Is that the case?

A: Absolutely. That's one side of the story. It's not just environment, which mediates the processes. Non-resistance means that it's something rational but cannot be rationalized. I'm speaking sometimes about the sacred, the sacred as being connected with this hidden third. It is not in a religious sense, but in a philosophical sense: rational, but we can't rationalize it. This means sacred is something there, which is irreducible to my thinking, to my theory and my dogmas. It's the basis of respect I have for the other. It's the basis of tolerance and non-dogmatism and love I can have for the other, not just accepting the other as being there. I know that love is an irreducible part of the sacred, using the terminology introduced by Mircea Eliade, the founder of modern history of religions who lived in the United States. This third completes the picture we have as transdisciplinary reality, and is materializing given concrete terms like process theory and many other things. But it's also something beyond any theory.

Returning to your previous question I am saying now that transdisciplinarity is not a metatheory. It's not a theory at all. It's both science and art. In fact, it is neither science nor art. It's a new knowledge you cannot reduce to old knowledge. [Emphasis added—RV]

There is an interesting parallel with the methodology and definition of modern science. Modern science, as defined by Galilei and other founders, is the posit of three axioms. The axioms include mathematical universal laws, which are formulated in a non-natural language, which is mathematics. Second, you can discover these axioms through experiment. When we say experiment, we mean given rules for repetition of the same experiment with the same conditions. Third, there is reproducibility. In other words, we have to be able to get exactly the same results if we have the same condition of experiments because we have the same laws.

These three axioms were revolutionary when they were formulated three centuries ago. But they don't exhaust the realm of reality. That's the point with transdisciplinarity. It is a larger field that includes the Subject, which includes subjectivity. We clearly put on the table the value of subjectivity, of feelings, of intelligence in feelings. When I began to speak about things like that about 20 years ago, people were slightly laughing, because I was a physicist speaking about this. Now, scientists like Antonio Damasio, the neurophysiologist, began to discover that feelings and the human body have cognitive value. Transdisciplinarity is about a new type of intelligence, which connects the analytic mind with the feelings and the body. It is connected with personal experience, but not any kind of experience, because the experience in general is chaotic. *In vivo* reality, which is about transdisciplinarity, is not chaotic reality. It's a reality that still has laws and rules and is obeying the axioms I was talking about.

Q: Is this what has led to the new principle of relativity that you write about?

A: The new principle of relativity has to do with the fact that every level of reality of the Subject and of the Object, is what it is because all the other levels exist at the same time. What this means is there is coherence. You see reality in the transdisciplinary approach, and reality is not schizophrenic. It's not putting together different levels, but connecting them. This is based on scientific knowledge, because in pure science. We saw incredible coherence between the universe and the infinitely small, the quantum world. It's how quantum cosmology appeared.

Big Bang is a theory uniting the infinitely small with the infinitely long. Because at the beginning, our universe was a small, small thing in which only quantum processes were there. This means that clearly there is a relation, a link between the infinitely small with the infinitely long. This means that if you cut a level by itself, you lose information. In order to keep all information together, the identity of a level of reality is connected with the identity of all other levels and that has great implications. Many other people have extended these considerations, not only to disciplines, but also to cultures and religions. This principle of relativity asserts that every culture is what it is because all the other cultures are there at the same time. Every religion is what it is because all of the other relations are there at the same time. It doesn't mean we're looking for a new religion or new culture—that would be nonsense.

When we speak about transreligion and transculture—these are the two key words in transdisciplinarity, in this field of the principle of relativity—we don't speak about unity in the sense of dogmatic unity. Each religion has to have dogmas in order to speak in a clear way. In culture, you have to have a set of rules to identify American culture, European culture, the various types of cultures. When we speak about transculture, we don't mean one culture all over the world. We say there is unity of cultures, but in a transcendental way. This is similar to what Rene Thom calls a strange attractor. It is like a strange attractor in the sense you have an asymptotic point that is there, but you cannot put your hands on it. If it's very carefully done, we avoid the wrong turns of transdisciplinarity.

Q: So this new principle of relativity honors all the levels?

A: Right.

Q: What is the role of David Bohm's work on implicate and explicate order? How does that relate to transdisciplinarity?

A: I knew Bohm and I had interactions with him. I met him in California and also in London. There are some connections. His implicate order has to do with the hidden third. It's not identical, but it's connected.

Q: What about Lazlo's work with the Akashic field?

A: I know Erwin and I respect his work, but I don't see the connection.

Q: Why is that?

A: I don't know. I think that he doesn't take this notion of levels of reality seriously enough.

Q: Are you familiar with the work of the American philosopher Ken Wilber?

A: Yes. I've been told I need to meet him, but the opportunity has not come about. Many people say that there are big connections, but I must confess I don't have a lot of knowledge about his work. I was glad to see that the famous art critic Suzi Gablik connected the two theories in her famous book *Has Modernism Failed*. The last chapter is about transdisciplinarity and she connects it with integral theory. I was surprised that she is familiar with transdisciplinarity. She considers it the only new thing that has happened in philosophy and knowledge in this last period. I was impressed, not just because she says such nice things about transdisciplinarity, but it was from deeply inside and genuine and there she connects transdisciplinarity with the theory of Ken Wilber.

Q: One of the ways that I see a connection is with Wilber's notion of integral methodological pluralism, and it would seem to me that in the transdisciplinary approach, what we're talking about is a methodological pluralism in whatever it is we're approaching.

A: I have to study his concrete definitions, but based on what you just said, there is a pluralism within transdisciplinarity via the very existence of different levels. The different levels are like different viewpoints you can take on reality, but they're all connected. If you just stay on a level or point of view, you are losing information. It is a strange pluralism in transdisciplinarity, like an oxymoron—unity in pluralism.

Q: I love it!

A: It is like the old Hebraic words for God, Elochim. My friend André Chouraqui told me that it is singular and plural at the same time. I think that is what we need. We need a different kind of universal language, in which we have to understand that single and plural go together. The whole point about transdisciplinarity is to take them together.

Q: Given the ideas of transdisciplinarity have been around 20 years or more, have you seen any significant progress or accomplishments emerge from this approach?

A: Of course—and fortunately, because otherwise it would mean I invested for nothing. If there is no concrete thing, there is no value, my theories were useless. There are different concrete fields. One field in which there is already a lot is education. I worked many years with UNESCO on a project of applying transdisciplinarity in higher education. We met in a Congress in Locarno in 1997, sponsored by UNESCO. That was the turning point toward practical applications in education. This means renewed methods of teaching in different fields, and introducing transdisciplinarity in universities. I'm proud to say that I succeeded, myself, after many years of fighting in many countries, I

now have two possibilities—one in South Africa and one in Romania—to start Ph.D.s in transdisciplinarity. There are many people in the world who are at the intersection of different fields of knowledge and they have no way to do their Ph.D. studies, because there is no department in the world. So all the work I did with many, many friends all over the world was to create these conditions. Slowly they are appearing through applications made by individual professors. They are appearing. You can see it in the last issue (in French) of “Transdisciplinary Encounters,” the magazine published by the organization I’m leading, CIRET, on the concrete application in education. In South Africa, they are on the way to do that at Stellenbosch University. There are many places in which there are transdisciplinary lectures; in the U.S., in Romania, in Italy and even in France. Myself I am teaching transdisciplinarity at the Babes-Bolyai University from Cluj-Napoca, in Romania, for doctoral students.

Another field in which I’m very happy to see that it’s moving towards transdisciplinarity is the realm of health. There is one important organization in Quebec, led by one of our members, Patrick Loisel, who even founded a transdisciplinary department for health sponsored by the Canadian Institute of Health. It’s financed by government and at the University of Sherbrooke, in which he brought together people from different specialties for handicap problems. They are applying transdisciplinarity ideas and *methodology* with the levels of reality, but in concrete terms and in context. They’ve convinced people that everybody wins with this connection.

The other ways in which transdisciplinarity is applied is in a powerful country of transdisciplinarity, Brazil. The formation of transdisciplinarity among university people, but also different social workers, has been at the University of Sao Paulo for three or four years. In fact, in Brazil, in September 2005, we had the second World Congress of Transdisciplinarity, and to my surprise I saw that more than 50 universities were represented from Brazil. They were not only teaching transdisciplinarity, but using it in organizations of departments and curriculum.

Another way is the problem of law studies. They are especially interested to include the problem of the included middle in the problem of law. This is an important problem.

Q: So how can other people get involved?

A: Unfortunately the university is still reluctant, so you get involved through people, through different groups and organizations—NGOs. CIRET is one of them. We have a rich data bank, we give information on the events, we publish research and studies, so we connect with people working on that. My ambition for the next several years is to see that entering into institutions, because institutions need that. Otherwise, universities will disappear. If a university doesn’t adopt transdisciplinarity, in my opinion, universities, as we know them from the 13th century, will disappear and be replaced by highly specialized institutions.

Q: Thank you. You have given us a lot to think about and some challenges to engage with.

A: I thank you very much because your questions were extremely stimulating.

CHARTER OF TRANSDISCIPLINARITY

Preamble

Whereas, the present proliferation of academic and non-academic disciplines is leading to an exponential increase of knowledge which makes a global view of the human being impossible;

Whereas, only a form of intelligence capable of grasping the cosmic dimension of the present conflicts is able to confront the complexity of our world and the present challenge of the spiritual and material self-destruction of the human species;

Whereas, life on earth is seriously threatened by the triumph of a techno-science that obeys only the terrible logic of productivity for productivity's sake;

Whereas, the present rupture between increasingly quantitative knowledge and increasingly impoverished inner identity is leading to the rise of a new brand of obscurantism with incalculable social and personal consequences;

Whereas, an historically unprecedented growth of knowledge is increasing the inequality between those who have and those who do not, thus engendering increasing inequality within and between the different nations of our planet;

Whereas, at the same time, hope is the counterpart of all the afore-mentioned challenges, a hope that this extraordinary development of knowledge could eventually lead to an evolution not unlike the development of primates into human beings;

Therefore, in consideration of all the above, the participants of the First World Congress of Transdisciplinarity (Convento da Arrábida, Portugal, November 2-7, 1994) have adopted the present Charter, which comprises the fundamental principles of the community of transdisciplinary researchers, and constitutes a personal moral commitment, without any legal or institutional constraint, on the part of everyone who signs this *Charter*.

Article 1:

Any attempt to reduce the human being by formally defining what a human being is and subjecting the human being to reductive analyses within a framework of formal structures, no matter what they are, is incompatible with the transdisciplinary vision.

Article 2:

The recognition of the existence of different levels of reality governed by different types of logic is inherent in the transdisciplinary attitude. Any attempt to reduce reality to a single level governed by a single form of logic does not lie within the scope of transdisciplinarity.

Article 3:

Transdisciplinarity complements disciplinary approaches. It occasions the emergence of new data and new interactions from out of the encounter between disciplines. It offers us a new vision

of nature and reality. Transdisciplinarity does not strive for mastery of several disciplines but aims to open all disciplines to that which they share and to that which lies beyond them.

Article 4:

The keystone of transdisciplinarity is the semantic and practical unification of the meanings that traverse and lay beyond different disciplines. It presupposes an open-minded rationality by re-examining the concepts of "definition" and "objectivity." An excess of formalism, rigidity of definitions and a claim to total objectivity, entailing the exclusion of the subject, can only have a life-negating effect.

Article 5:

The transdisciplinary vision is resolutely open insofar as it goes beyond the field of the exact sciences and demands their dialogue and their reconciliation with the humanities and the social sciences, as well as with art, literature, poetry and spiritual experience.

Article 6:

In comparison with interdisciplinarity and multidisciplinary, transdisciplinarity is multireferential and multidimensional. While taking account of the various approaches to time and history, transdisciplinarity does not exclude a transhistorical horizon.

Article 7:

Transdisciplinarity constitutes neither a new religion, nor a new philosophy, nor a new metaphysics, nor a science of sciences.

Article 8:

The dignity of the human being is of both planetary and cosmic dimensions. The appearance of human beings on Earth is one of the stages in the history of the Universe. The recognition of the Earth as our home is one of the imperatives of transdisciplinarity. Every human being is entitled to a nationality, but as an inhabitant of the Earth is also a transnational being. The acknowledgement by international law of this twofold belonging, to a nation and to the Earth, is one of the goals of transdisciplinary research.

Article 9:

Transdisciplinarity leads to an open attitude towards myths and religions, and also towards those who respect them in a transdisciplinary spirit.

Article 10:

No single culture is privileged over any other culture. The transdisciplinary approach is inherently transcultural.

Article 11:

Authentic education cannot value abstraction over other forms of knowledge. It must teach contextual, concrete and global approaches. Transdisciplinary education revalues the role of intuition, imagination, sensibility and the body in the transmission of knowledge.

Article 12:

The development of a transdisciplinary economy is based on the postulate that the economy must serve the human being and not the reverse.

Article 13:

The transdisciplinary ethic rejects any attitude that refuses dialogue and discussion, regardless of whether the origin of this attitude is ideological, scientific, religious, economic, political or philosophical. Shared knowledge should lead to a shared understanding based on an absolute respect for the collective and individual Otherness united by our common life on one and the same Earth.

Article 14:

Rigor, openness, and tolerance are the fundamental characteristics of the transdisciplinary attitude and vision. Rigor in argument, taking into account all existing data, is the best defense against possible distortions. Openness involves an acceptance of the unknown, the unexpected and the unforeseeable. Tolerance implies acknowledging the right to ideas and truths opposed to our own.

Article final:

The present Charter of Transdisciplinarity was adopted by the participants of the first World Congress of Transdisciplinarity, with no claim to any authority other than that of their own work and activity.

In accordance with procedures to be agreed upon by transdisciplinary-minded persons of all countries, this Charter is open to the signature of anyone who is interested in promoting progressive national, international and transnational measures to ensure the application of these Articles in everyday life.

Convento da Arrábida, 6th November 1994

Editorial Committee Lima de Freitas, Edgar Morin and Basarab Nicolescu

Translated from the French by Karen-Claire Voss

<http://nicol.club.fr/ciret/english/charten.htm>