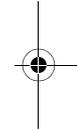




## Introduction for the English edition

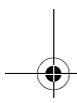
This book presents a rather long conversation that I had with Bernhard Poerksen about the history of my work on the biology of cognition. It is no more but no less than that. So I have not much more to say in this short preface than what I have already said in the book. Yet, I would like to add some reflections on how I lived what the book tells. In particular I will reflect on three basic turning points that I lived while I was working in what became the biology of cognition and the biology of love.

The three turning points that I am talking about occurred to me in relation to my becoming aware of the systemic implications of three ordinary features of our daily living. They were the relational nature of questions, the ordinary fact that we commit mistakes, and our normal daily trust in the repetitiveness of natural phenomena. Of course I knew that questions take place in the relation of the person that asks the question and the person that answers it. Of course I knew that I committed mistakes, and of course I knew that I trusted the regularity of natural processes in my daily living. The expansion in my awareness referred to my becoming conscious of the consequences of acting in the awareness of what those ordinary circumstances and processes of our daily living entail for our doings and our understanding of what we do. Let us see:



### Questions and answers

If we attend to the relational nature of questions and answers, we can easily see that the person that accepts an answer to his or her question determines in his or her listening what makes the answer that he or she accepts valid for him or her. Whatever the question may be, it is a constitutive feature of the question answer relation that the person that accepts the answer determines what makes it a valid answer. Yet,





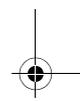
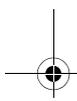
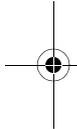
this is not a peculiar feature of questions and answers; in every relation in which something offered is accepted, the person that accepts what is offered determines the truth, value, or adequacy of what is accepted. Of course what I say is not new, indeed is well known. Yet, if we accept that that is indeed the case, we cannot henceforth ignore in what we do that nothing is true in itself, valuable, adequate or acceptable in itself. Furthermore, if we accept the implications of what I have said above, the following questions arise: what is to know? What is the sense of fighting for the truth? When a scientist asks a question to nature and obtains an answer through experiments or observations, is he or she aware of the fact that it is he or she who determines the validity of the answer obtained, by choosing the criterion that he or she uses to accept or to reject the results of the experiments or the observations?

When I became aware of the fact that it is the observer who decides the validity of what he or she accepts as valid, and that that is a constitutive feature of the relation question and answer, I realised that the questions proposed above had to be answered taking that into consideration.

**We commit mistakes**

We live as if we had in some way a direct or an indirect access to that which we call reality to validate our statements or explanations. Yet, we commit mistakes. We say that we learn through our mistakes, but we punish others, whoever they may be, politicians, children, scientists, parents, philosophers... for the mistakes that they commit. What does this reveal? We treat mistakes as serious failures in our behaviour that reveal a guilty blindness in front of a reality that we should see because we have the ability to do so.

If we ask ourselves what occurs when a mistake is committed, we shall easily see that a mistake is an action done in the honest acceptance of its validity in the moment that it is done, and that is later devaluated as a mistake in relation to an other action whose validity is accepted without doubt. But, to the extent that this is so, mistakes are not mistakes in themselves, they are not failures, they do not reveal our blindness about reality. Mistakes do not happen in the moment in which we say that they occurred, they happen afterwards when we compare actions occurring in successive moments. We do not know that we commit a mistake when we commit a mis-



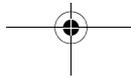


take. Mistakes do not occur in the present, they occur afterwards. If we had know that what we were doing was not valid in the moment of doing it, we would have been lying. Mistakes are not faults, mistakes are not failures of our capacities, mistakes do not show our limitations, mistakes arise as reflections on the course of our doings. But, if we do not know in the moment in which we do whatever we do, whether we shall later see that doing as a mistake in relation to something else which we do not know either if we shall later see this other doing as a mistake, in what sense could we claim to have access to an independent reality to validate what we do? In what sense can I claim that I know the truth, or how things are, if I do not know if I shall later think that such claim was a mistake? Why should any one be punished for committing a mistake? What is to know, then?

When I became conscious of the fact that mistakes are not in themselves, that they do not occur in the present, and that they occur after the action that is later called a mistake has been done, arising in a posterior act of reflection, I thought that the question "what is to know?" had to be answered accepting that we never know in the moment that we do what we do if we shall later call it a mistake.

#### **Trusting the repetitiveness of nature**

We move in daily life trusting that that which we call nature is repetitive, trusting that that which worked once will work again if the proper conditions are realised. This trust is the fundament of all that we do in our daily living, whatever this may be, cooking, gardening, science, technology or philosophy. This, of course we all know. Moreover, we all know that the things that we make, as well as those that are natural, operate according to the way they are made, and we trust that. Of this we are probably all aware as we operate in our daily life. But of what we are not all aware is of the fact that to the extent that natural and artificial "things" operate according to how they are made, we cannot specify by acting on them what happens to them, and all that we can do is to trigger in them changes that arise determined by the manner they are made. We as living systems are not an exemption, as molecular entities we are like all other molecular entities, and what happens to us at any instant is determined in us by the way we are made at that instant, and not by the external agents that impinge upon us.





When I became conscious of the fact that external agents do not specify what happens in us, and that they only trigger in us changes determined by the way we are made, I asked myself, what is to know then? How will anything external to me tell me anything about itself if what I see, hear or accept, is determined by the way I am made? In these circumstances the question, what is to know? has to be answered accepting as part of our natural existence the fact that nothing external to us can tell us anything about itself.

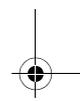
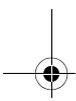
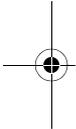
As I became progressively aware of the broad implications of these features of our daily living, my understanding of biological processes expanded and began to change. I began to be aware of the processes that gave origin to whatever I distinguished, and instead of asking about how things were, I began asking for the processes that gave origin to them, and for the criteria that I used to accept the answers that I considered valid. This book is thus the history of a change of question, the history of going from the question how is that?, to the question, what criterion do I use to claim that something is as I say that it is?

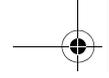
### Reflections

In this preface I am doing a philosophical reflection about my work because I am reflecting on the fundamentals of what I say, not because I am a professional philosopher, which I am not. All human beings do philosophical reflections when they ask about the fundamentals of their beliefs or of what they think they know. I also think that one does science whenever one proposes a process that would generate, as a consequence of its operation, some experience that one wants to explain. This book is also the history of some philosophical reflections and of the scientific answers to which the questions that arose from those reflections.

As such in this book I tell my life, and I thank the reader for making me the gift of reading it.

*Humberto R. Maturana  
Santiago de Chile, April 2004*

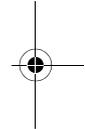
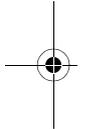




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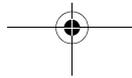
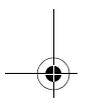
## Introduction

Human life occurs in daily living. This statement sounds obvious, and it is so. Yet, by saying it I want to emphasise that all our activities, regardless of whether they are homely, artistic, professional, or technical, are only particular cases of our daily living, and *do not* entail anything different from what we do in our home chores other than the special features of the relational and operational spaces in which they take place, or the different purposes, aims or desires under which we do what we do. This book is a reflection about how we do whatever we do, and about the history of how the various notions presented in it arose in the course of my daily living in the attempt of understanding how we see, how we hear, ... and in general how we know what we claim to know.



I was an ordinary child with an ordinary living, and the only thing that perhaps was in some way peculiar in me was that I have conserved as features of my daily concerns certain questions that arose in me as a child. And as I conserved these questions I lived them as if they were aspects of my daily living that I wanted to answer with the elements of my daily living. This was not trivial. Somehow I was not interested in essences. I did not want to know how things were in themselves. I wanted to know how they happened. I loved to make my own toys, I loved to climb trees and to listen to the many sounds that the insects made. I loved insects, crabs, plants, animals in general, and I liked to collect the hard remains of their bodies, to see how they related to each other and to their manner of living.

I liked to move, to jump, to walk and to run, and in that way I knew my body as well as the different worlds in which I existed as they arose with my movements and live them in the pleasure of doing whatever I did. I felt that I was like the insects and the crabs that I liked to contemplate, and whose skeletons I liked to examine to see





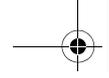
how they moved in relation to the way they lived. I lived in doing. I saw in doing. I thought in doings. This just happened to me. Yet as a child of my culture I lived at the same time in a world that happened around me and existed outside of me by itself.

This book reveals the history of a metaphysical change in my thinking, in my feelings and my way of understanding life and the worlds I live. This book does not contain the history of the reflections of a philosopher or the history of the doings of a scientist, it contains the history of some aspects of the experimental research and philosophical reflections of a biologist interested in understanding living, perception, and cognition as a feature of the continuous flow of the living of living systems in general, and of us human beings in particular. Therefore, although this book does not contain the history of a scientific quest, it tells of the history of the expansion of the understanding of life and of humanness that takes place when a biologist accepts as a matter of daily experience that all that living systems in general, and all that human beings in particular, do and experience takes place in the realisation of their living as living systems, and thinks that life, cognition, and consciousness are biological phenomena to be explained as such with the features of the coherences of living without additional assumptions.

Our present patriarchal-matriarchal culture is lived in an implicit, and sometimes explicit metaphysical view that entails accepting as a matter of course that existence occurs in a background of essences that exist independently of what we human beings do. I call this metaphysical attitude or fundamental reflective standing point of our patriarchal-matriarchal culture *the metaphysics of the transcendental reality*.

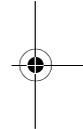
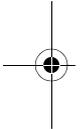
Our patriarchal-matriarchal culture is centred around the separation of what is apparent from what is essential under the spell of the question that asks for what is, for what is real, rather than for what do we do when we claim that something is the case. In this culture we live in the search of our essential being, our true self, in a quest that proves again and again impossible to fulfil because at the same time we accept *a priori* that that question does not have an answer in the domain of our daily living which is where in fact we do all that we do. And, as a result, we are forced to fall again and again either into total scepticism about our possibility of understanding ourselves as selfconscious languaging systems, or we are forced to fall in a sort of



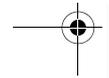
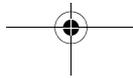


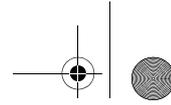
theological thinking to justify our biologically unexplainable existence as human beings.

This book shows how I abandoned the metaphysical attitude of our culture that takes for granted the existence of an independent reality as the transcendental background on which everything occurs, conscious that this attitude cannot be sustained because it has no operational support in daily life experience. As a result, instead of asking questions such as “What is life?”, or “What is cognition?”, or “What is consciousness?” in a way that takes for granted that the answer must arise searching for some support in an external reality in the way we develop our arguments, I began asking questions such as “How do we do what we do as we do whatever we do as human beings?” or “How do we know what we claim that we know?” or “How do we operate as observers making the distinctions that we make in any domain?” in a way that implied that I accepted that the answer that I would accept had to take place in the form of the actual operation of the living systems. And I did so explicitly accepting that all the concepts and notions that I was to use as I answered these questions had arisen derived from the coherences of my living as a living system without introducing any transcendental assumptions in the process. Indeed, to ask these questions as they are presented above entails abandoning *de facto* the implicit metaphysical attitude or *a priori* thinking of a culture that accepts the existence of a transcendental reality as the necessary fundament of all existence, and source of validation of all that we human beings do or can do. Moreover, the very act of asking questions like “How do we do what we do?” in the disposition of answering them as I do, implies accepting that one can answer these questions because they are asked in the domain in which the human beings do what they do as living systems.



A metaphysical attitude that accepts that the essence of being is transcendental entails an attitude that denies the body as the fundament of human knowledge, human understanding, and human consciousness, and gives rise to an epistemological view in which the body is seen as an interference and limitation in the path of true knowledge. At difference from this, a metaphysical attitude that does not arise from the *a priori* acceptance of the existence of a transcendental reality is not concerned with the essences, but instead accepts that all that a human being does arises through his or her body





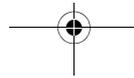
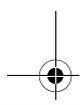
dynamics in the conservation of living in interactions with the medium that makes it possible. From such a metaphysical attitude the body and the body dynamics are recognised by the observer as the fundament of all that the human being does, and the observer asks the questions mentioned above under the general form of "How do we do what we do?" in the full acceptance that our existence as human beings occurs in our relational space in the realisation of our body dynamics. In fact, the implicit or explicit acceptance that we exist as human beings doing whatever we do in the continuous conservation of our human living through our body dynamics is the basic understanding that leads one to abandon the metaphysics of the transcendental reality adopting a new one that takes as starting point for any explanation or rational argument the acknowledgment that we are living systems and do all that we do in the realisation of our living. In this metaphysical view our biology is our condition of possibility. And as a matter of fact it cannot be otherwise since the observer disappears as his or her bodyhood is destroyed.

**An example. The metaphysics of the transcendental reality**

*What is this? – A table. – How do you know that this is a table? – I know because I see it. – And how can you see it? – I can see it because it is there, and I have the ability to see what is there.*

This argument stands on an *a priori* explanatory principle that says that something can be distinguished because it is independent of the observer and is independent of the observer because it is real. Moreover, this argumentation stands on the implicit acceptance that there is outside of me an independent reality that is the fundament for all I do, including the reasoning that validates this statement. In this metaphysical attitude a statement is universally valid in relation to what is independent of what the observer does.

A metaphysical attitude arises as a matter of course implicit in the cultural upbringing of a child as an unreflected background of legitimacy that is lived as the ultimate fundament that gives validity to whatever he or she may claim in that culture to be undoubtedly true as a matter of fact or rationally supported. That background is not reflected upon, and if a question arises about its validity such a question is usually answered taking as a fundament for the validity of the answer precisely that which one wants to inquire about. Due to this, if one wants to reflect on the validity of a metaphysical attitude it is



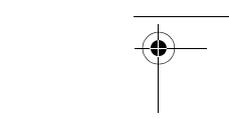


necessary that one should release completely the implicit certainty that one has about the nature of the question "What is to know?" and about the manner in which it must be answered. This is what I found myself doing (in my neurophysiological research on visual perception) without being initially aware of what I was doing when I asked in my research on visual perception "What is it to see?"; and I wanted to answer this question looking at the domain of the biological process that constituted seeing in the domain of the operation of the nervous system of the observer in the act of observing as a relational dynamics organism/medium. As I proceeded doing so I soon realised that I had to abandon the notion that the observer existed by itself as an ontologically independent entity, and I realised as well that the question I was asking was about my own operation (How do I do what I do in the domain of seeing?), and that my operations were at the same time what I had to explain and my instruments of explaining them.

I had to explain the observer (myself) and observing (my doing observing) operating as an observer observing, and I had to do so without any ontological assumption about the observing while accepting that the observer arose in its operation as an observer and did not pre-exist its own self-distinction. The task that I began was a circular task and I wanted to explain what occurred in this peculiar circularity (I wanted to explain knowing through knowing) without coming out of it. In doing this I had to explain all that we humans do by doing what we do, not by making any reference to some independent domain of existence. *And all this led me to inquire about living, explaining, language, emotions, and the origin of our humanness.* I was making a metaphysical shift, I moved from the traditional metaphysics that assumes that the world we live pre-exists our living in it, to one in which the world we live exists as it arises with our doing it.

In this metaphysical shift I was abandoning a metaphysical attitude that accepted *a priori* that the observer existed by itself as a transcendental entity that uses other transcendental entities as instruments for explaining and reasoning, and I was adopting one in which the observer arose into existence in the moment of his or her distinction as he or she used as a starting point for all his or her reflection the domain of his or her doings in daily living. In fact I found myself doing this metaphysical shift in the process of explaining the manner of operation of the nervous system in the phenomenon of perception,





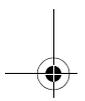
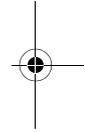
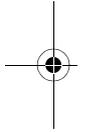
and before I became aware that in doing so I acted accepting as a matter of course that I, the observer that was doing the explaining, did not pre-exist to his or her own distinction of himself or herself operating in the observing.

### **An example. The metaphysics of the arising reality**

*That animal that you see yonder is a horse. – And how do you know that it is a horse? – I know that it is a horse because I recognise in it the characteristics of a horse. – And how do you know that those characteristics that you recognise are the characteristics of a horse? – I know because I have seen them in other horses. – And what is a horse? – An animal that those who know horses call a horse because it has the characteristics of those animals that they call horses. – But that is a circular argument. – No, it is the revelation of the circular operation that constitutes the validation of a distinction in the domain of experiences of an observer as he or she operates as a human being.*

In this metaphysical attitude there is no ontological assumption, and the observer is always open to reflect on the fundamentals of his or her manner of explaining and on what he or she thinks gives validity to what he or she considers valid. In this metaphysical attitude a statement is universally valid in the domain in which the conditions that give validity to it are satisfied.

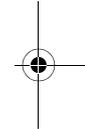
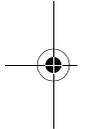
This was a fundamental metaphysical change that I did initially without being aware of what I was doing. I was a biologist, a scientist explaining perception and cognition as biological phenomena, and I did not want to lose in the formulation of my explanations the biological processes or phenomena that I was explaining. So I attended at the coherences of my doings and my reflections on my doings in my operation as a human living system. No doubt I was aware that at the same time that I was doing physiology I was aware that to the extent that we all do philosophy when we reflect on the fundamentals of whatever we do I was also doing philosophy, but I did not like to say that I was doing so because I did not want to obscure the listening of my colleagues about the scientific nature of my research. Moreover, it was not until Ximena Dávila Yáñez, my colleague and co-founder with me of the *Matristic Institute* for teaching Biology of Cognition and Biology of Love in Santiago, said to me that she thought that I had created a new metaphysics, that I became fully aware that in fact I had done so, and that I had to be explicit in acknowledging that I was aware that I was not only doing biology but that I was also



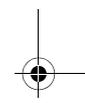
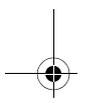


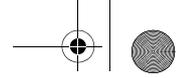
doing philosophy. I am grateful to Ximena Dávila Yáñez for showing this to me and for the expansion in my understanding that her reflections brought to me.

The separation of science and philosophy is a classificatory artifice that by separating reflection and doing interferes with the understanding of what we human beings do in our living as such, and has obscured our understanding of the different worlds that we bring about in our living, and of what happens to us and in us as we live these different worlds. And this happens because in the separation of science and philosophy we deny ourselves the possibility of fully reflecting on the fundamentals of what we do, either because as scientists we think that such reflection is irrelevant because all that matters are facts, or because as philosophers we think that what we need is ultimate truths, and not the pragmatics of material events. The expression 'Natural Philosophy' grasps better what scientists and philosophers want to do when they begin to listen to and look at each other in mutual respect and not mutual devaluation. All that we human beings do occurs in our daily living, and if we do not see and accept that it is so, we cannot appreciate how our biological existence as languaging living systems results in something that could not have arisen through technology without the creative participation of human beings, if for no other reason because technology is a product of our humanness as biological entities. Furthermore, without the metaphysical shift presented in this book, this understanding would not be possible because we would be trapped in the intrinsically unending search for some transcendental reality that we take *a priori* as the ontological ground that is the origin of all that happens to us in our living and our thinking, but which has not and cannot have operational presence.



The doings of daily living are primary in the sense that whether we like it or not they are our starting point for whatever we do or whatever reflections we make. We explain our living with the coherences of our living. However, that we do so does not constitute a circular argument because an explanation does not replace what it explains. Explanations only tell what should happen for that which is explained to arise as a result. So, the explanations of the observer and of observing do not replace the observer or observing, they only show what processes should take place for an observer and its operation in observing to arise, as well as how the observer and the

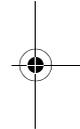
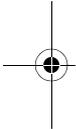




observing would arise if the conditions that give rise to them and to their operation were to take place. Accordingly, it is because the metaphysical shift presented in this book keeps us in the domain of the operational coherences of our living (and all that we do, whatever it may be, we do it in our operation as living systems) that it is possible as a result of this metaphysical shift that we may explain all that we do through the coherences of our living without making any ontological assumption. In a scientific explanation the observer explains his or her experiences with the coherences of his or her experiences mostly unaware of the metaphysical implications of what he or she does. Moreover, scientists frequently argue that their explanations are supported by laws that are a reflection of the coherences of nature as an objective domain of processes that exists fundamentally independent of what he or she does, and they are not aware that the laws of nature are abstractions of the operational coherences of their living.

I was fortunate growing up as a boy who was in some way an unaware natural philosopher interested in understanding the spontaneous dynamic architecture of living beings seduced by their anatomical beauty. And I was also fortunate in that I did so again in an unreflected fundamental attitude of participation in the dynamic architecture of the living because I never saw myself as different from all those marvellous beings that I observed. However, may be that I was not even there different from other children, as I never saw myself different from them in their curiosity, what was again a blessing that permitted me to grow as myself in full respect for being whatever I was becoming.

Finally, I would like to remark in this introduction that although the metaphysical shift that I have done resembles in some aspects to the oriental philosophy, it is fundamentally different. Oriental philosophy stands on the distinction between what is permanent and what is transitory, and invites us to adopt the path of liberation of the transitory to recover the permanent divine essence that we all have. In the oriental philosophy the transitory is an illusion to be overcome. In the metaphysical shift that I have done, in the fundamental attitude of the metaphysics of the arising realities we living systems in general, and we human beings in particular, arise belonging to the domain of the transitory where the transcendental is a notion about something of which we cannot speak because any attempt to do so





negates it, and leaves us in the domain of our daily living which is where the transcendental does not exist. But this does not matter because all that is good in human life belongs to the domain of what is not permanent, and it is in that domain that love exists as our fundament as human beings, and as our source of well-being.

At the end I wish to express my acknowledgment and thanks to Beatriz Gensch, my wife, for the many conversations that we have had on matters of aesthetics, philosophy, and spiritual life, conversations that have expanded my understanding and enriched my daily living in all dimensions and have brought well-being to me in all that I do. Yet, I want above all to acknowledge that it was through these conversations with her that I became free to talk about love as a scientist.

*Humberto R. Maturana  
Santiago de Chile, January 2002*

