

Ontogenesis of the illness

Introduction

A constant and fundamental concern in the work of Humberto Maturana is to provide a scientific explanatory content about the human being in his systemic dynamics as an operational unit in the responsibility of his being. According to what he points out in his work, in the living systems "autopoiesis implies subordination of all changes in the autopoietic system to the maintenance of its autopoietic organization... to the conservation of its unit". (De Máquinas e Seres Vivos, 1997, Ed. Artes Médicas, pg. 91) This concern is part of and bases all the development of his Theory of Autopoiesis. For Maturana, the ontogenesis¹ of the living being, and in particular the human being, is deeply linked to its operational way of living in autopoiesis, that means, in its developing and individual dynamic configuration that characterizes and distinguishes it from the medium where it lives as an autonomous entity. This article aims at explicating some central aspects of his theory, developing along the body of the text some conceptual purposes around a notion of illness that is congruent with such essential aspects of this new biology of knowing.

Traditionally, western medicine, mechanic-biological, also known as allopathy, has its vision focused on the structural components of the organism. From this perspective, the alterations of the cellular and molecular components of the organism are directly responsible for the falling ill phenomenon. All technological development in the sciences of health, concerning diagnosis and treatment, aims at discovering a cause and an explanatory mechanism to the illness that is noticeable to the medical observer in terms of alterations in its cellular and molecular components. For each illness name it is said to be an altered mechanism directly associated, as well as a treatment that aims at compensating the mechanism through prudent chemical substances of local action. Strictly speaking, this is the bearing principle of modern medicine, that tries to scientifically substantiate the comprehension of the chronic illness phenomenon and its treatment. For infecting-contagious illnesses, the principle is similar, adding that every phenomenology of symptoms is understood as triggered basically from the pathogenic properties of bacterium and viruses. They cause the events in the domain of the illness, as if these entities could

specify the characteristics of falling ill in a subject who lives his existence. From this point of view, the phenomenon of feeling in the altered sensations and functions of the organism along his life that, yet, always occurs on the language and interaction between doctor and patient, would hold a straight crossing with the altered structure of the organism, one causing the other, not bearing any other possibility of explanation for the illness following the traditional medical concept.

We will see, in this short article, that these traditional concepts of illness are not compatible with the new systemic biology developed by Maturana. We will see that the physiologic domains of the organism do not specify their behavior level with their sensations and functions and that what occurs inside the organism is determined exclusively by itself in an operational cloister. Besides, we will also see that, to the knowledge of the illness, both by the medical observer and the patient, it is essential to understand the essence of the human cognitive process that occurs in the language and, as a result, develops a draft about a new thesis of knowledge of the illness which goes beyond the cause-effect linear concepts, nowadays, in hegemony within the biological sciences. According to Humberto Maturana "it is in the center of the modern man difficulties not to know his own knowing" (A Árvore do Conhecimento, 1995, Ed Psy II, pg. 264).

Structural determination

Humberto Maturana started the development of his Theory of Autopoiesis, nowadays accepted in several segments of the biological sciences and epistemology, studying the color perception on doves' retina. After many attempts to explain the color perception through stimulus of lightning waves without succeeding as expected, he could, through an epistemologic turn, formulate a consistent thesis to explain and demonstrate the phenomenon of color perception. Maturana concluded that the specification of color perception as it occurs does not depend, in any moment, on the frequency of lightning wave. On the contrary, the perceptive phenomenon is exclusively determined by the changes in the activity relationships of the CNS structure in a global way. He claims that any cognitive perceptions are, above all, groups of states of neural activity and not lengths of wave captured and

1. Ontogenesis - the life cycle of a single organism; biological development of the individual: distinguished from phylogeny. (Webster's Dictionary)

decoded from an objective reality itself. "We should focus on understanding that the color experience corresponds to a specific configuration of states of activity in the nervous system determined by its structure" (A *Árvore do Conhecimento*, Ed Psy II, 1995, pg 65). He called this phenomenon structural determinism.

It is important to point out that the structural determinism is not directly related to the constituting properties of each cerebral component involved in the event, being them neurons or molecular substances, but to the activity relationships as flow and movement of cerebral patterns in a closed net of operations of activities in its structure.

There are two main initial consequences of this concept. The first one is the clear and definite stating of the CNS², operation, as of any biological cognitive system³, as a net operational system, closed in itself. For example,

"the immunologic system is mainly an operational cloister to the lymphocyte and immunoglobuline, which allows a somatic identity to the multicellular organism.

This net develops only secondarily, along the course of its evolution, defensive capacities such as immunologic response to infections... however, the heart of the system running is constituted by a somatic identity (De Máquinas e Seres Vivos, Ed Artes Médicas, 1997, pg.56). In other words, it characterizes the human being as a system existing in the cognition, such as an operational state of production of elements that produces all the needed elements for self-production. For a living being to keep alive, the only necessary condition is that, in its historic, its structure is continual dynamic modification, maintaining its internal operational coherence towards the medium.

It is clear that, at the same time, the living systems are obviously open structures from the thermodynamic point of view, because of their constant or periodic need for energetic apportion, essential condition for the constitution of self-organizing structures. But on their way of operating in a medium, on perceiving and acting on the consequences of distress, the living beings are systems that operate closed in a relationship dynamics of internal states that specify their domain of actions. For Maturana, what distinguishes living beings from their medium is that they have such organization that their only product is themselves, there is no division between producer and product, between being and acting.

The second consequence, deriving from the first one, is that given the condition of operational closing, the living system that goes through interactions with the medium is not instructed by the last one. This means that the medium, that can be another organic system, never specifies what happens with the living being who suffered the distress. In fact, the distress of the medium only triggers changes in the relationship of activities of the internal states of the organism as a unit, these ones structurally determined in their operational closing. In Maturana's words, "nothing can happen in the living system that is not determined by the system itself"⁴, or yet, "The states of neural activity that are triggered by the different distresses in each person, are determined by their individual structure and not by the characteristics of the distressing agent" (A *Árvore do Conhecimento*, Ed Psy II, 1995, pg 65). Strictly, it is the organism that specifies what it admits as interaction and as a distress factor and not vice-versa, as we are used to think. What happens after any interaction or distress is entirely dependent on the structural dynamics of the changes in the internal relationships of the organism as a whole, and not only on its components⁵.

While the organism is the one to specify what happens with it after being distressed by the environment, this understanding opens a rich possibility in the studies of human and individual susceptibility, having in mind that not all beings fall ill with the same pathogenic exposition. The proposal I present in this article is that, within the autopoietic and dynamic concept of the illness, the individual internal susceptibility is the key question in its comprehension and treatment. Susceptibility can be understood as the condition of the structural dynamics of a living being which specifies what can be considered a distressing agent. It also specifies the operational way during a state of illness.

In other words, it specifies the way the subject falls ill, contrasting to the traditional point of view that emphasizes the pathogen element as central in the specification of the illness. On the other hand, it is important to observe that this approach on the living being in operational cloister, specifies and characterizes a domain in the internal activity of the automatic organism and not intentional in the emergency of action domains in terms of behavior, that appears in terms of a not soluble unit or totality of the being, already identified several times in philosophy and science as a kind of vital activity.

2. Nervous Central System.

3. The immune system for example.

4. Maturana, 1997, *Ontologia da Realidade*, ed. UFMG, pág.60.

5. According to the reductional concepts in use in modern biology.

Structural coupling

No living being lives isolated. On the contrary, it emerges in a medium in which it is distinguished, although it lives adequately in this same medium. Every system that operates in operational cloister exists in a medium. The existence of this organism occurs and is kept while its interactions with the medium trigger, in the being itself, changes in the changes of dynamic relationships of the structure that are congruent with the transformations happening in the medium, being them provoked by the organism itself or not. By such way, this living system becomes able to live in this medium. These interactions result in other interactions which again trigger other changes of internal states of the organism that must be congruent with the modifications in the medium where they are distinguished from and live. And so on. Maturana named this process dynamics "Structural Coupling" of the organism with its medium. For life to occur, this coupling must necessarily be reciprocal and mutually generative, although the medium never specifies what happens inside the organism, because this is, as we have seen, determined in the structural dynamics of its body as a whole.

Continually, every living being lives in movement, always inserted in a medium, where it interferes all the time in the way it operates in reciprocal structural correspondence. Any external observer⁶ would say that such organism identified something in the reality when associating its movement to the environmental condition. But, it is important to point out that, for the organism, in its operational closing, nothing else happened than its vital activity of autopoiesis maintenance, according to its conditions for internal structural dynamics. What, for an observer, can be related to a learning process, for the organism that tries, what happens is a dance of internal correlations with the only automatic sense of keeping its self-production.

This medium, continually modified, created and recreated by the domain of actions of the living being, is called "niche". This is the closet environment where a structurally determined system lives. According to Maturana, "to live is to slide on the accomplishment of a niche".

From this operational congruency between a living being and its niche, from this well-succeeded structural coupling there are conditions for total accomplishment of a living organism autopoiesis. If an adequate coupling does not occur, there are no conditions for this accomplishment so the organism either falls ill or dies. Under these conditions, if the changes in the changing of relationships of internal states in their operational closing are defective, the structural change ends up compromis-

ing the natural homeostasis, emerging illness phenomenon. On the other hand, if the organization of the living structure itself is compromised, the death of the organism may occur. In other words, all interactions or physiological alterations that occur inside the living being are subservient to its autopoiesis in a closed net of self-production of itself. Or yet, autopoiesis is the only condition of the path of its internal states, which continually modify from the inside, of its structural dynamics, in a reciprocal coupling and mutually generative with the environment.

This medium does not specify, in any moment, what happens to the organism in its operational cloister. The structural coupling with the medium is a dynamic condition of the existence and complementation between the system and the environment. If this complementation is lost there is illness and/or death. The preservation of this coupling is the preservation of the adapting process of the living being in its environment, of its relationships with it, preventing the harm of its autopoiesis.

The behavior: action and illness

Every sensorial experience in the world is inseparable from the phenomenon of knowing, and, for Maturana, we can not separate our history of actions from how the world seems to be. "Every act of knowing produces a world". (A *Árvore do Conhecimento*, Ed Psy II, 1995, pg. 68) Knowing, perceptive action as behavior, the cognitive act is an essential fundament in the theory of Humberto Maturana.

According to what we have observed, a system that is determined by its structural dynamics exists in constant interaction with the medium, literally building a niche from which it is distinguished, in a single act, specifying what it admits as interaction in the meaning of a structural coupling that allows its well-succeeded autopoiesis. This, besides being a developmental and dynamic relationship between the organism and the medium, is, also and mainly, a recursive relationship, where the action happens over the products of the previous action, continually.

Within this framework, when there is regularity or coherence in the recursive action shown by the organism in its congruent operating and with structural correspondence with the medium, an observer would say that the mentioned living system perceived something, established a cognitive process in its acting, when associating the movement to the environmental circumstance.

6. That can be the organism itself, in case it has self-awareness.

7. Maturana, 1997, O.R., pág. 87.

So, according to Maturana, “while the NS⁸ experiences its closed dance of changes in the relationships of activity, not paying any attention to the environment we describe as medium, we see, as observers, the organism in this same medium experiencing state changes that we see as sense-effector correlations that we describe as behavior”. (Maturana, 1997, O.R. pg. 91) or yet, “we name behavior as the changes in the posture or position of a living being, that an observer describes as movements or actions, towards a certain medium” (A *Árvore do Conhecimento*, Ed Psy II, 1995, pg 167).

That is, what is a behavior for an observer, for the organism itself, in its closed dynamics of relationships, is only an experience of life relationships in the sense of keeping its autopoiesis. For the organism itself, “the behavior is not something the living being really does, since only internal structural changes happen in it, it is something that we [observers] point out”. (A *Árvore do Conhecimento*, Ed Psy II, 1995, pg 167) We configure then, in these relationships, a concept in which the cognitive act consists of the constitution of a world of actions where its autopoiesis is kept. “Every to do is to know and every to know is to do” (A *Árvore do Conhecimento*, Ed Psy II, 1995, pg 68).

Therefore, behavior or cognitive act is something that, by definition, the observer⁹ observes in the changes of position or form of an organism, in a changing flow of sense-effector correlations in their sensations and functions, which are disturbed by their interactions with the medium (but not specified), or are generated as a result of their internal structural dynamics. Behavior is the distinction by the observer of pure movement and action in the relationships of the living being, being congruent or not with the medium in the sense of being alive, healthy or ill, according to the efficiency of the structural coupling with the medium.

The question which can not create any confusion is that although the behavior is the result of these internal state changes shown by the organism, and, this way, dependent on its structural dynamics, these structural changes themselves, while simply cellular and molecular alterations, do not constitute or determine their behavior on a linear relationship of cause and effect as it could seem in the present common sense. It means that the structural dynamics of an organism occurs in a domain that we could call anatomo-physiologic, because, being operationally closed in itself, does not receive specifications from the outside and, at the same time, does not directly specify any behavior. This is the reason why there is no crossing between these two domains of an organ-

ism existence: nothing coming from the outside specifies what happens in the internal structural dynamics of an organism. This dynamics can only be altered according to its exclusive operational mode level with its internal susceptibility; this one able to specify what can disturb it. The opposite is also true, that means, its structural dynamics does not specify what happens in the observation of its life of relationship. According to Maturana's theory, there is no way to reduce a phenomenon to another one without missing the comprehension of unit and totality of the system, so precious to the Theory of Autopoiesis.

Actually, the necessity for anatomo-physiologic phenomenon is obvious for the occurrence of mental behavior or events, but those first ones do not specify these last ones.

The operating of this structural dynamics, as seen before, follows a contingent course with the behavior domain and vice-versa. A domain generates the other one, but they are not reducible between themselves. They occur in a crossed net of non-linear recursive processes, mutually generative, not directly specifying or causing the observed alterations in their own domains.

It is clear that an observer, who ignores the operational closing as a basic characteristic of the living being and who contemplates both domains at the same time, can establish cause-effect relationships among the phenomenon, as it occurs for the allopathic medicine concept, but, this way, loses the capacity to observe the indissoluble unit of being, translated into the huge amount of medical specializations and into the endless list of categories of illnesses that the human being suffers from.

On the other hand, concerning the organism that directly experiences life phenomenon, what this last one perceives is only its behavior domain that, in the human being, is based on the language and emotions. We will see later on that this is the fundamental reason for the increased value of the empiric experience of the sick person, of the feeling of his alterations in language and emotion, for the understanding of an illness inserted in the dynamics of living and doing, instead of the common understanding of the illness while pure and simple alteration of the cellular or molecular structures of the organism.

Within this framework, our understanding of falling ill in the autopoietic process also occurs in two phenomenal domains which do not cross out, despite being mutually generative. The first domain is the one, which happens at the operational closing of the organism in its structural dynamics. In this domain, the sense-effective correlations are automatic and blind concerning the domain

8. Nervous System (Autjor's Note).

9. That can be of himself.

of behavior relationships. That is, in its physiology, the organism reacts automatically, exclusively determined by its structural relationship dynamics, not being specified, on its mode, by any external distress, also not specifying, at the same time, its way of behavior. The second domain is exactly the one observed as a cognitive phenomenon that occurs every time the observer¹⁰ operates in the language for the description of the way the action/behavior of the organism occurs. Therefore, the symptoms and all the alterations related to sensations and altered functions told by the patient in the language are phenomenon which occur, described by an attentive observer in the domain of the action and the behavior as a cognitive act, and not simply in the domain of its physiology. It is impossible to reduce, from this point of view, a domain of phenomenon to another one.

It means, for the autopoietic theory of life, that we could not consider an observed and told symptom as a straight reflex of a structural alteration, even if the existence of an altered physiology is obvious, without losing the notion of the dynamic whole. As we have seen since the beginning of this work, Maturana's constant concern about the consideration of the dynamic unit of the living being is a trademark of his epistemology. So, the illness as an observable phenomenon must be cognitive data because it is distinguished in the language, both from the patient and the medical observer, and all its understanding must occur in the domain of actions and relationships for us to know its dynamic and individual totality.

Behavior and mental states (the language, the awareness and the emotions)

For any living animal, its existence only occurs in the domain of its interactions, in its life of relationships, and its internal states will only be noticed in this domain of behavior. The animal physiology originates and makes the life of relationship possible, but does not specify its way of life. This way of life, characteristic of each species or each individual, occurs in the operation of the organism as totality and unit in the action, and not in the pure and simple operating of its individual components.

For Humberto Maturana, in the emerging of the psychic, in terms of structural dynamics, nothing in the operating of the NS¹¹ directly and mechanically represents what really happens in the life of relationship of the organism in its medium. "In the nature there are radically emerging properties [such as the psychism and the aware-

ness] that come out from their base components, but are not reduced to themselves". (De Máquinas e Seres Vivos, Ed. Artes Médicas, 1997, pg. 48) That means, for us, human beings, "the psychic life is [only] our way of living our relational space as human beings and this living of ours occurs for our talking, for our living in the talking"¹² and "it has its own properties such as system or totality, that are not properties of its components" (De Máquinas e Seres Vivos, Ed. Artes Médicas, 1997, pg. 29).

The definition for the psychic in the Autopoiesis Theory is of a relational dynamics expressed by the individual in the living and suffering, but it does not belong to the cellular and molecular structure of the NS, not being, therefore, treated as a material entity to be found in the NS, exactly for belonging to a phenomic domain different from the structural dynamics. This way, any system that is determined in its closed structural dynamics and that shows a kind of observable behavior related to a structural coupling with the medium can be said to be an animal that lives in a psychic space.

In this psychic space, distinguished this way in the domain of the human being relationships, the language can be understood as a group of linked sequences of state changes in the language, inside an agreed domain of the species, in which the organism is able to maintain its autopoiesis. These linked regularities, as coordination of coordination of actions in the language, may be present in any living being having a NS, but, as spoken language, are only characteristics of the humans in the evolution of the species.

Even if it cannot be reduced to its physiology, the language, which occurs in a psychic space, is an expressive system of coordinated actions of the internal state that experiences the organism, all the time, in its structural coupling with the medium. This way, different people, with different modulations of the internal structural dynamics, generate and modalize, mutually, different psychic spaces. We are in the body what we are in the psychic, in being and living, in acting and doing, in short, in the individual cognitive act. "What we do is inseparable from our experience of the world" (A Árvore do Conhecimento, Ed. Psy II, 1995, pg 66). Although the psychic is manifested in the dynamics of living beings relationships, especially of the human beings, it is lived by each one in the individual solitude, so the meaning impregnated in the building of the existence only happens in the living of each person, at every time, through the language in the manifested dynamic totality.

10. That can be of himself.

11. Nervous System.

12. Maturana, 1997, O.R., pág. 115.

The physiologic organism always takes along its way of life both as a result of the totality modulation of its structural dynamics and also as its relational domain in moving in the interactions of the simple living in the language, in a mutual generative relationship between these two existential domains. From this point of view, there is no body-mind interaction as it is traditionally conceived. On the contrary, it is about an only existential dynamics. It is a domain of cognitive actions where the organism, in a single moment, specifies the medium where it lives and is distinguished, engaging itself dynamic and structurally in recursive actions, coordinated and regular, which biggest example is the language, in the single sense of maintaining its autopoiesis, that means, the production of productive nets of itself. For us, humans, everything is born from this come-to-be movement, from constituting itself when constituting a world in the language.

The emotions have a crucial role in this framework. According to Maturana, the human is lived in talking and thrilling. All human actions, even the rational, are based in thrilling. Any operation of the human organism in the environment is a behavior that is based in the emotions. The emotion is a space of the experience when we move in the existence, in the flow of congruent and recurrent actions coordination in the language. It is a condition which modules our individual living continual and contingently. So, every living being, especially the human being, exists as a totalized dynamic unit in continual relationship and change. For us, this dynamic aspect is fundamental for the understanding of the illness in the autopoiesis theory.

The crossing of our emotions with our living in the language follows a contingent course, mutually generative, with our internal structural dynamics and its balance, being able then, according to the circumstances, to emerge a pattern of illness that specifies, in the being and doing of the individual, a domain of symptomatic totality in terms of emotions and contingent psychic life to an individual clinical state. Every falling ill process is a unit in movement that cannot be separated or reduced to its cellular and molecular components only, neither separated from the thrilling and from the psychic life of the individual.

The mind, inserted in the Autopoiesis Theory, as well as the awareness and the self-awareness, is a phenomenon, which is distinguished in its specification in the human language. It is not a physiologic entity that can be located in CNS as the biological science taught so far tries to convince us. For Maturana, the mind is a phenomenon that emerges from the relationship life, and not a property of cerebral molecular components. The experience of awareness, when specified in the language, appears as an action experience in the living, in an exclusively cognitive domain,

always keeping the structural coupling of the organism with the medium for the maintenance of autopoiesis. Therefore, the study of mental phenomenon, of the emotions, as well as sensations and altered functions of the organism in the illness, specified in the language of the one who self-observes, are fundamental in the understanding of falling ill in the individual dynamics.

According to Humberto Maturana, what happens and is special about the cognitive process of awareness is that it "is a self-distinction experience... and I claim that the awareness happens as a particular relational dynamics [that can be with itself in the example of self-awareness], when the organism operates as a participant of a domain of recursive distinctions in the language and that awareness is not an entity or a property of an entity" (Maturana, 1997, O.R., pg. 214).

In other words, the mind is the way the NS operates in us, humans, that uses the language as a dynamic interaction, allowing us to live the experience of awareness and self-awareness. It is because of this self-distinction condition that we experience the ego as located in our body as a whole. On the other hand, the maintenance of our body as a whole is closely related to the awareness and to the language as an experiencing human mode. "What we do in our language and in our awareness has consequences in our body dynamics and what happens in our body dynamics has consequences in our language" (Maturana, 1997, O.R. pg. 168). Actually it is about a unit and totality conception of the human being in the action, in the cognitive act we execute all the time we distinguish anything in acting, doing and speaking.

Life phenomenon, loaded with its entire blemish, according to this systemic biology purpose, is the distinction of a single existential dynamics, autopoietic in a domain of cognitive actions. Everything is born from this come-to-be movement of acting, constituting a world when self-constituting.

So, from this point of view, the emerging of the illness in the interior of our body as a whole is a contingent and mutually generative phenomenon with the totality of our existential dynamics, in the living of the language and in the emotion as an expression of an operationally closed structural dynamics, and any attempt to reduce the illness phenomenon to the level of the cellular and molecular components of the organism, or separate what is physic and what is psychic, becomes a perspective of losing this dynamic totality that is so expensive and important for a living being unit in the acting of its existence.

The ontology of the objectivity

According to Humberto Maturana, any observer fol-

lows an explanatory way which depends, basically, on his preferences, on his internal disposition to implicitly or explicitly accept and choose one of the following two initial conditions in his observation of the reality: 1) the properties of the observer and of the reality are independent data existing in themselves, not dependent on the observer and 2) the occurrence of the observer's living in the language distinguishes and designs a reality that depends on the observer's experience. He calls the first case "objectivity without parenthesis" and the second one "objectivity in parenthesis".

Our author adopts the defense of the second, because he refers that

"the reality we live in as a domain of explanatory propositions always reflects, all the time, the flow of our interpersonal relationships, a characteristic that does not depend on us being aware of it or not, while a constituent characteristic of our operation in the human biology of observing" (Maturana, 1997, O.R., pg 265).

Therefore, any cognitive domain represents a behavioral domain of the organism, in genuine actions of the individual in its praxis of living, and there are as many domains as possible, either in the sphere of behavioral patterns of the animal species or in the sphere among humans. Every cognitive domain generates an explanatory domain of the living and the knowing of a world and every domain of reality is a way of living, falling ill and dying. There is no invariable reality itself which is independent from the one who knows and builds it. Maturana discusses this unmistakable objectivity of things we are used to and of the thinking as a symbolic representative of this supposed "independent" nature. He substitutes this for his understanding that reality is constituted, all the time, of the observer in his operation of the knowing. "We cannot separate our history of actions from how [the world] seems to be" (A Árvore do Conhecimento, Ed Psy II, 1995, pg 66). The extreme regularity of operations of the living being, with the continuity in time, offers us the concrete impression of the existence of ourselves and all the other things.

This also happens in the domain of human illness according to the autopoietic concept of life. It is in the essence of the illness knowledge from the observer, the purpose that his genesis happens in the praxis of his living and not as an isolated structural data, objective and independent from the ones who live and build their own state. What we do and feel, being healthy or ill, is inseparable from our world experience.

Maturana offers an explanation to show the great stability that reality offers to the cognitive process. In the movement of language communication, it is possible to establish certain agreed domains of behavior, giving agreement

and regularity to reality, that supply the unprepared observer with the impression of an independent objectivity. This agreement is, in short, a result from cognitive interactions, that are generated by a system determined by its internal structural dynamics, and whose sense-effective organization is common to the species in their phylogenetic evolution. It is in the recurrence of these generative recurrent interactions that a regularity of the world seen and lived is intensified, so that we can speak and experience this reality being understood by the fellow creature. But for us, attentive readers to the autopoietic theory of life, we never lose the notion that the experience and constitution of reality is unique for each living being to carry it out. It is the pattern of recursive and agreed meetings that brings to perception the stability of the created reality, being this in health conditions in a structural coupling or not.

Conclusion

Our goal, with this article, was to show how recent research in the biology of knowing and scientific epistemology can support a concept of systemic illness that differs from the one practiced by the medicine accepted as scientific in our western world so far. We fundamentally are able to characterize eight basic principles, which could establish this conceptual difference of the illness:

It is clear that living systems are systems determined by their structural dynamics in operational cloister. We characterize, this way, a kind of "internal command" that, inside its operational closing that produces the elements which produce themselves, is blind and automatic towards the behavior. That is, its operating is autonomous, despite being contingent, from the living being behavior. This so called internal command is characterized by changes in the relationship changes between the totality of components of the organism in a closed net of relationships which produce themselves. "The characterization of the minimum living unit can not happen only over the base of material components. The description of the organization of the living as a configuration or pattern is also essential." (De Máquinas e Seres Vivos, Ed Artes Médicas, 1997, pg 47) Patterns, operational cloister, autonomy and totality are fundamental characteristics of the autopoietic concept of life.

That behavior, by definition, is something that is observed by an observer in the relationship changes as a way of acting of an organism facing a distress. This distress does not specify anything happening inside the organism, since this one operates in operational cloister. The behavior, then, is characterized by an observer's description of the changes of position/action and of sensation/function of the organism facing such distress. The notion of illness as an observ-

able phenomenon, can therefore be fit very well in this concept of behavior: while altered sensations and functions, observed by the ill person himself, his relatives and the attentive doctor. From this point of view, it is the acting while behavior in the illness that characterizes the illness, in a domain of structural coupling with the partially well-succeeded medium, reported in the language by the patient and not its reduction and exclusive physiologic manifestation level with its material components.

It is clear that the illness needs a physiology in order to happen, but the organism in its operational cloister does not admit any kind of exterior information that determines its operation, even if this is in the illness, because its operation is determined by its condition of autopoietic internal structural dynamics. What is important to understand about this dynamic concept, is that the illness as an observable event is only possible to happen level with the behavior, the individual action in illness and as such has to be considered in the individual language, and not as a direct consequence of the molecular alterations of its structure. At the moment we use the language to express any event we are already in the domain of the behavior. Thinking, language, emotions are all phenomenon of the human behavior in the reality acting and it is for them, while observable events, that the conditions of the internal structural dynamics are expressed.

That, therefore, these two phenomenal domains, structural determination and behavior, cannot be reduced to each other. That means, what occurs level with the behavior does not have as the cause factor the local alteration of the components of its physiology, even if it needs this one to happen. Such domains have a contingent relationship and are mutually generative in their happenings in the praxis of living, while an indissoluble unit in the dynamic observation. There is no way how to separate the illness from the living, the speaking and the thrilling of each unit in the living being as totality, placing it as a pure and simple manifestation of the physiologic.

That the perception of the altered states of the internal economy of the organism during an illness can only be perceived in the domain of the behavior, where the language and the thrilling are emerging phenomenon. In this domain of behavior, the events are expressed in terms of the living being unit. Therefore, developing medical practices that give value and operate the indissoluble totality of the individual's symptoms, clinic and at the same time psychic, both from the points of view of semiology and therapeutics, exactly the way they occur in the individual's language, match the most modern theories of the living beings organization.

That, in the operating of human beings, the language is their main existential mode at the behavior level. For us humans, all reality is distinguished in the language.

Therefore, the way of reporting what the ill person feels altered in his sensations and functions is, for the autopoiesis theory, the main investigative method for the distinction of an illness state and it is on it that we have to base, mainly, any therapeutic form.

That the language occurs in a relational psychic space, as well as the mind, the awareness (and the self-awareness) and the emotions. All this cognitive phenomenon group is a unit of come-to-be, in constant dynamics and movement. In this case, there is no interaction between mind and body; there is, on the contrary, a unit in permanent action in the existence, where every behavior is distinguished through the observer's language, that can be his own. This means that, despite all the technological benefits modern medicine has to offer in diagnosis and treatment of alterations in the biological components of the human body, in the autopoiesis theory, it is still in the language, through the reporting of the direct and empiric experience of the sick person with his illness, that we find the real vitality and meaning of the illness dynamics in the individual who lives his own praxis.

That, at last, the approach of the illness as objectivity in itself does not depend on the subject, disguises and mixes up the understanding of the dynamic totality of being and doing, in the domains of behavior and language. As Maturana questions the notion of reality itself, objective and not variable, we can also question the illness as infallible and exclusive data of the cellular and molecular objective alterations, since its distinction occurs in the language, even when we face information considered to be objective, because even these ones are distinguished in the language. This way, the illness can, in every moment, be modulated by the individual experience of the subject who lives his blemish. The epistemological development of an illness understanding linked to the subject in his direct experience of the living and falling ill is, therefore, more and more necessary.

I believe, so, that such definitions are not only theoretical and epistemological. They surely can, along with the practices which involve the modern systemic theory of medicine and biology, practiced by doctors and having experimental systems established within this systemic framework, lead the scientific thinking of the 21st century about the living systems to unusual practical consequences, either in the individual or the collective health field, representing a turning in the paradigms of the understanding of what we call illness. This way, we are before two paths to follow, two systems of medical thinking: the traditional one that we call medicine of the biological components and this new and revolutionary one that I call medicine of the dynamic unit of the living being.