LIFE, THE MULTIVERSE AND EVERYTHING:
AN INTRODUCTION TO THE IDEAS OF HUMBERTO MATURANA

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Contents

ABSTRACT This chapter introduces the central concerns of Humberto Maturana's theory of autopoiesis as they relate to the domain of psychotherapy. Several common terms which are redefined within his theory in an unusual manner are unpacked as to their idiosyncratic significance including the expressions, 'linguistic behaviour', 'languaging', 'structure determinism', 'organisation', 'structure' and others. The source material used for this exposition include not only the cited texts but also several workshops from which verbatim transcripts are often used in the form of brief quotations. I have attempted to stay as close to the original material as possible in order to convey both the meaning and the texture of Maturana's work. This is not an easy theory to grasp ranging as it does across several specialist fields from the neurophysiology of perception through social communication to epistemology. Nor are the implicative transitions from a theory of biology to the praxis of psychotherapy without complexity and controversy. Nonetheless, Maturana offers a novel theory of conversations which could form the basis of a much needed new paradigm for personal change.

PART 1 - LIFE, LOVE AND LANGUAGING

Maturana used to use the phrase 'biological stickiness' to describe how any two systems, upon encountering one another, stayed or 'stuck' together. They fit together and remain together and continuously interact recurrently with each other. More recently he has used the more dangerous word 'love' to describe this happening of living. Love is a phenomenon which takes place a priori, without precedent, and without prior justification. Maturana claims that if you tell someone that: "I love you because you are so beautiful / intelligent etc." then either you do not really love that person or you are pretending to have reasons for something for which there are no reasons. 'One simply falls in love and every love is love at first sight even if it arises after living together for 20 years.' In other words love is an expression of a particular structural configuration in the two participants such that they stick together with no reason. Love is a primary constitutive condition and is fundamental if social phenomena are to arise.

Being in love means making a space for one another so that each becomes part of the domain of existence of the other, and within their continuous recurrency

of interactions they form a system in which they have a co-ontogeny. It is the recurrency of interaction within the medium that creates the conditions for co-ontogeny. If they fit, one with respect to the other, then they form a path of (structural) drift together. Within this co-ontogenic drift new phenomena will arise immediately.

Without love there would be no social phenomena. This is an important point since for Maturana many crucial human phenomena are social e.g. language, self-awareness, mind, self etc. By ontogeny is meant the living system's history of structural drift in which its course of structural changes is contingent upon the interactions it undergoes in its medium. Each interaction triggers a particular change and the next interaction triggers another particular change and so forth.

The living system and its medium are operationally independent and so whatever changes of structure take place are determined by the structure of the system itself at every moment. The path of change is contingent upon the history of interactions in the medium. When we look retrospectively we can see that the system and the medium are in correspondence, i.e. they are in congruence with one another.

"Every system is where it is, in a present, in congruence with its medium, and cannot be anywhere else." This is a typical statement by Maturana whereby he means to underline the coherence and congruence of each system in its domain of existence. A human system may not like where he is in the medium, and may feel extremely badly about what "life" has doled out to him, but he is where he is through a coherent series of structural interactions and changes in his ontogenic drift. It is interesting that we apply the word "drifter" in a pejorative manner to those folks who most obviously exemplify the human condition of structural drift, as if we , by our 'rootedness' were escaping this essential constraint and thereby exerting 'control' or 'steering' over our lives in a determining way.

Both the living system and the medium change in congruence with one another. They change their structure / shape so that they fit together in a drift. The concept of drift does not imply a chaotic situation because it is being determined on a moment-to-moment basis by the interactions. The path of drift is contingent upon the interactions. So unilateral steering is an illusion. This path of drift is a path without any choices. It is a path of conservation of (a) the organisation of the living system and (b) of congruence with the medium. This is the paradigm for survival.

When we have two living systems (A and B) interacting with one another each one forms part of the medium of the other. Within their co-ontogenic structural drift A's structural drift is contingent upon its interactions with B in the medium and vice versa. From an observer's point of view you could describe this co-ontogeny as the co-ordination of actions between A and B, since there are consequences for A/B of each others actions in the medium. Further, we can say that without this co-ontogeny, certain behaviours between A/B would not have arisen. Within the co-ontogeny the behaviours of A/B become consensual - i.e. they have created a consensus about the coordination of their behaviours).

Consensual behaviour is behaviour between two systems as a result of living

together. These would not have appeared had they not lived together. The behaviour is contingent upon their ontogenies. These behaviours can be described as interactions in the medium. This consensual coordination of behaviour is what Maturana calls LINGUISTIC BEHAVIOUR. Examples of linguistic behaviour can be easily observed occurring between humans and their pets. One instance being the consensual coordination of a cat scratching a door to be let out of the house by its owner. Another may be seen if you inadvertently move to stand on your dog's tail, it moves its tail out of the way of your foot. These behaviours arise because of their co-ontogeny, of living together.

An observer could describe these interactions in semantic terms, i.e. one could ascribe meanings to the elements in the coordination of behaviour e.g. "the cat is telling his owner that he wants to go out". However Maturana is keen to point out that there is no intrinsic meaning in the linguistic behaviour. What is happening is that the two systems (person + cat) trigger various structural changes in one another. Maturana gives the following example of structural changes triggered by interactions to underline the absence of meaning; In the process of lens-making two pieces of glass are ground together. By using certain rotating movements you will produce one concave and one convex lens. We could either say that these two fit together or that the concave is meant to contain the convex.

However, this ascription of meaning (of purpose/intent) is not a feature of the geometrical correspondence. What we have are changes of structure contingent upon their interactions. We have two congruent structurally dynamic entities such that the changes of structure of one trigger congruent changes of structure in the other which in turn trigger changes in the first which are congruent with it. By sticking to structural descriptions Maturana aims to empty out all other types of symbolic explanations. The starkness of Maturana's position is ameliorated by Varela (1981) who, while agreeing with Maturana that notions of purpose, information or code cannot play any logical role in the description of autopoietic systems , points out that our human cognitive capabilities will remain unsatisfied unless such explanations are also complemented with carefully constructed symbolic explanations.

The coordination of action in relation to interactions in the medium is called Linguistic Behaviour or Linguistic Interaction. This always takes place when two living systems live together and have structural plasticity in the domain of their recurrent interactions. Structural plasticity is necessary, in that the systems must be able to change their structures when triggered by one another.

> " The plastic splendour of the nervous system does not lie in its
> production of 'engrams' or representations of things in the world;
> rather, it lies in its continuous transformation in line with
> transformations of the environment as a result of how each
> interaction affects it." (Maturana and Varela,1987, p. 170).

Given sufficient structural plasticity and the continuation of recurrent interactions then we may observe the coordination of behaviour - not only in relation to interactions in the medium but also in relation to these coordinations of actions. That is they coordinate their behaviour in relation to the coordination of

behaviour. We observe consensual behaviour about consensual behaviour. We see linguistic behaviour about linguistic behaviour. This is what Maturana calls "Language".

When we get a recursion in the coordination of consensual behaviour, so that there is consensual coordination of behaviour of consensual coordination of behaviour then we have this new phenomenon which is language.

> " So, we can also say that language is a domain of recursive linguistic co-ordinations of actions, or a domain of second-order linguistic co-ordinations of actions. We human beings also co-ordinate our actions with each other in first-order linguistic domains , and we do so frequently with non-human animals." (1988;p 48).

For Maturana several important phenomena arise with language including -

(a) The Observer
(b) Humanity
(c) Meaning
(d) Self-awareness / consciousness, and
(e) Objects

What makes us human is languaging. "Humanity arises in the social dynamics in which languaging takes place". This is difficult to prove but Maturana cites examples of feral children brought up by wolves so that what we find are wolves with the genetics of Homo Sapiens. They never learn to speak (although they may know a few words).

It is important to note that no particular behaviour or movement or gesture or sound constitutes languaging. Rather, it is an ongoing process because it is defined in the history of the coordination of actions. Just a word or gesture does not constitute languaging. Furthermore, languaging is not an abstract phenomenon, we are not dealing with abstract entities.

Languaging becomes part of our medium and so anything we say is not trivial since it becomes part of the domain in which our co-ontogenic structural drift takes place. That is, our co-drifts are contingent upon our languaging. Languaging interactions are as powerful as a physical interaction e.g. pushing someone hard. If I say "How beautiful you look" - this has certain consequences in terms of a "particular configuration of structural perturbations." This statement is like a caress. Equally, if I say "you look terrible" this is another particular configuration of structural perturbation. Such an interaction Maturana calls "like hammerings in the head", i.e. it is painful.

> "Thus we say that the words were smooth, caressing, hard, sharp, and so on: all words that refer to body touching. Indeed we can kill or elate with words as body experiences. We kill or elate with words because, as co-ordinations of actions, they take place through body interactions that trigger in us body changes in the domain

of physiology." (1988:p 48).

Structural changes triggered here include changes in blood pressure, blood flow, hormone flow production, brain synapses undergoing different changes etc., all depending on what is said. These changes take place unavoidably as a process of structural change contingent to the interactions and hence as a drift because the course of structural change is being specified on a moment-to-moment basis in the interaction.

However, DRIFT will only go in the direction that the circumstances will allow. Drift will not go in any imaginable direction. The example here is to consider the path of a boat which has no rudder, oars, engine, or mast etc. being generated as a drift.. Even if we could specify and compute the structure of all the systems involved and were thereby able to predict the direction of the drift (which we cannot do) it would still be a drift, because the system flows in its own dynamic of structural changes. This is not to say that we cannot alter the direction of the drift for example by what we do in languaging since this (languaging) defines conditions in which the drift takes place. If we language one way ("you're beautiful") the drift goes this way rather than that way ("you look terrible"). The human dilemma is that we want to pretend to control our lives (and others' lives) as if we could specify the outcome of the drifting pattern.

The notion of control arises in the context of productivity. Maturana talks about 3 main modes in which we can act and these 3 are distinguished largely in terms of differences of intent.

Firstly, the Science mode - the intent here is explanations.
Secondly, the Technology mode - the intent here is production.
Thirdly, the Art mode - where the intent is Aesthetic.

Within the Science Mode the approach is to introduce variety in order to be able to generate more comprehensive explanations of phenomena. That is, novelty is introduced as a means to an end.

The Art Mode is to amplify free creativity to generate a self-saying aesthetic phenomenon which needs no further explanation. The artistic piece is self-producing,and self-sufficient in its final form. Here novelty is produced as an end in itself.

In the Technological mode we intend to achieve a particular result and so we specify certain constraints on the variability of the components of the system, with the result that the drift can follow only one particular course. Here novelty is excluded by systematic controls. This applies equally to technological supervisors in a car factory (ensuring that each car is produced with minimal variation), as well as to fascist dictatorships whose technological supervisors serve to control and eliminate any dissenting voices.

Although we cannot control our co-drift since its path is formed by moment-to-moment interactions, and although the concepts of choice and free will become redundant in this regard, we must still be extremely careful about our actions since whatever we do forms part of the medium in which we drift, and therefore we drift in a different way to how we would drift if we did nothing. So what we do

is not irrelevant to our drift, even if we cannot actually control the dynamics of the drift mechanism. Thus, whatever we do in languaging is not trivial because languaging is a manner of moving in a co-drift which makes it possible for us to complexify our human lives together.

The amount of complexity we can generate in human behaviour in terms of the recursion of coordination of actions about the coordination of actions is open or infinite. But nothing that we do in it is trivial.

"All that takes place in human life is languaging, and all that takes place in languaging is conversations".

"These are continuous mutual grooming interactions. We immerse ourselves in structural drift contingent to the conversations in which we participate and which we generate through our structural dynamics".

Note that language does not take place in the brain but rather in the social dynamics. Languaging is a way of being together in a collective, it is a way of co-ontogenically drifting. [Without the brain there is no language, but language does not exist in the brain]

Self-consciousness arises in languaging as a manner of consensual coordination of distinctions about the consensual coordination of distinctions in which the participants (i.e. those who are distinguished) are distinguished. In languaging we can reflexively describe ourselves, and describe ourselves describing ourselves and so forth. We do this through linguistic distinction of linguistic distinctions.

> " Self-consciousness arises in language in the linguistic
> recursion that brings forth the distinction of the self as an
> entity in the explanation of the operation of the observer in
> the distinction of the self from other entities in a
> consensual domain of distinctions." (1986:p 80).

So we see that self-consciousness depends upon languaging as a phenomenon of linguistic recursion. Self-consciousness, self-awareness, and mind are social phenomena because they take place in languaging, in the social domain.

Another importance of language within Maturana's system is that prior to language there are no objects. That is, objects arise with language. Objects are entities specified in the coordinations of coordinations of consensual actions.

> "...the participants of a consensual domain of interactions
> operate in their consensual behaviour making consensual
> distinctions of their consensual distinctions , in a process
> that recursively makes a consensual action a consensual
> token for a consensual distinction that it obscures."
> (1986:p 55).

What this means is that the object we bring forth obscures the operation of distinction it stands for. When I use my pen to ink marks onto this piece of white paper , the action of writing or 'inking' is an operation of distinction whereby I

bring forth the inked words on the page. So 'inking' as an action is the operation of distinction I can consensually enact and the inked words are the object I bring forth with my actions. The object is a consensual distinction which obscures the action it stands for.

So objects arise in languaging and at the same time obscure the operations of distinction for which they stand. Hence we are left with these entities which seem to exist independently of everything. This illusion of independent existence is achieved because the objects obscure the operations of distinction that constitute them. In this way objects are reified. "In the recursion of consensual distinctions of consensual distinctions we continually transform notions/concepts into objects".

Prior to human beings there were no objects, since objects arose with language. If we see a cat chasing and catching a mouse, then for Maturana the 'cat' is (not) eating the 'mouse'. Rather "it is flowing in the structural dynamics of its structural coupling/congruence in its domain of existence". The 'cat' does not exist as a 'cat' for the 'cat'. It cannot exist until somehow language arises for the cat.

> "We humans also 'do' many things without doing them. We
> 'walk' without walking. We perform many actions which we
> can talk about afterwards, but which do not pertain to the
> domain of languaging while we are performing them. So
> we are not doing them."

Many of Maturana's ideas, including the distinction between the domain of experience and the domain of explanations, and the impossibility of instructional interactions because of the structure-determined nature of living systems, can be read as echoes of Lao Tsu's work "Tao Te Ching", as the following passages from the Tao illustrate.

"A truly good man is not aware of his goodness,
And is therefore good.
A foolish man tries to be good,
And is therefore not good.

A truly good man does nothing,
Yet leaves nothing undone.
A foolish man is always doing,
Yet much remains to be done."

"In the pursuit of learning, every day something is acquired,
In the pursuit of Tao, every day something is dropped.
Less and less is done
Until non-action is achieved.
When nothing is done, nothing is left undone.
The world is ruled by letting things take their course.
It cannot be ruled by interfering."

In his presentations of this year [1985] Maturana has said that we are not in languaging all the time, referring to the previous comments of doing things

without doing them. One intention is to distinguish between the two non-intersecting domains which he calls the Domain of Experience and the Domain of Explanation. In postulating that we can never have less than these two dimensions Maturana claims that his approach is not reductionistic.

While, as observers, we are all in languaging all the time, language is not the only means we have of operating in consensual co-ordinations of actions. As we have seen, prior to the development of language are the linguistic co-ordinations of actions. So the decision as to whether or not we are in languaging when we are alone depends on whether or not the actions we are undertaking belong to some implicit domain of consensual co-ordinations of actions within our observer community. With this in mind we can understand that certain individuals are called 'mad' or 'eccentric' because they are seen to be enacting languaging but outside of any implicit or explicit domain of consensuality.

Conversations as Structural Perturbations

As humans we dwell in language, and are realised in the social domain through languaging, through our constitution of conversations in which we bring forth objects as if they were fixed entities. It is as if these objects exist independently of any observer (i.e. we assume that we 'discover' reality).

> " In daily life we call conversation a flow of coordinations of actions and emotions that we observers distinguish as taking place between human beings that interact recurrently in language....the different systems of co-existence, or kinds of human communities that we integrate , differ in the networks of conversations (consensual coordinations of actions and emotions) that constitute them, and therefore, in the domains of reality in which they take place. Emotions are not conversations, but we flow in our emotioning through the flow of our conversations." (p. 53, 1988).

Not all conversations elicit emotions, as we know . Maturana outlines a (non-exhaustive) list of six classes of conversations which we can distinguish among human interactions. These are defined in terms of differences in the pattern of coordinations of actions and emotions which are variously invoked and are as follows:

1. Conversations of coordinations of present and future actions; Such conversations are for the actual coordinations of actions which take place in relation to a particular domain. The conversational participants are only listening for the coordinations of actions here and there is no particular emotional content.

2 Conversations of complaint and apology for unkept agreements; These coordinations of actions, within the frame of emotions of righteousness and guilt are concerned with demands and promises.

3 Conversations of desires and expectations; These are coordinations of

actions undertaken by participants whose attention is oriented to future descriptions and not to the current actions through which they are being constituted as humans in the present.

4 Conversations of command and obedience; Such coordinations of actions take place within an emotional frame of negation. That is, by complying with commands to do as he otherwise would not do, the one obeying the commands both negates himself and the person commanding (by attributing to him a characteristic of 'superiority'). The one commanding also engages in this dual negation.

5 Conversations of characterisations, attributions and valuing; Here the coordinations of actions are embedded in an emotional flow of acceptance and rejection, together with the experience of pleasure and frustration depending on whether or not the listeners feel they have been correctly recognised or not by the speakers.

6 Conversations of complaint for unfulfilled expectations; In this case the listener feels frustrated by being accused of not fulfilling a promise that he did not make, while the speaker feels frustrated that the listener has dishonestly not kept a promise made.

" ...as we human beings participate in many different conversations simultaneously or in succession , our actual community coexistence courses as the changing front of a network of conversations in which different criss-crossing coordinations of present and future actions braid with different consensual emotional flows." (p. 53,1988)

By emphasising the interweaving of languaging and emotioning, Maturana unpacks further his notion that conversations are structural perturbations which have far-reaching effects on our bodyhoods. Our 'self' or 'identity' is defined by the totality of all the systems of social interactions in which we participate. In this sense our bodyhood is the time/space location of structural intersections of the many different systems which we constitute or participate in bringing forth through our actions.

Anyone familiar with John Searle's (1969) work on speech acts will note a strong similarity between these conversational types outlined above and Searle's five categories of illocutionary point, namely, **assertives, directives, commissives, expressives and declarations**. These outline varying patterns of commitment coordinated by speakers and listeners.

To close this section on conversations it is important to recall that languaging does not connote or denote independent objects, but is rather a system of orienting behaviour whose function is to generate a consensual domain of actions. It is to orient the listener within his own cognitive domain.

PART 2 - THE MULTIVERSE :

EXPANDING THE UNIVERSE THROUGH THE ONTOLOGY OF

THE OBSERVER

Problems with Perception: How is it that we make mistakes?

It is constitutive for Maturana that at the moment of experiencing we cannot tell a perception from an hallucination. From his analysis, the science of neurophysiology has failed to generate a mechanism which could explain our hearing/seeing objects external to us, independent of us. Maturana asks "How come we make mistakes in perception if it is the case that we directly see an objective reality?. He points out that at the moment of perceiving we never know that we are making a mistake - this awareness of a 'mistake' is always post-hoc. It is only afterwards that we can say it was an illusion, hallucination or mistake. These two are indistinguishable in the experiential domain. Hence the differentiation of a perception from an illusion is a social distinction formed in consensus with others, (usually in conjunction with some authority who has an instrument). We believe the external source of authority. "Illusion" is seen therefore as an explanatory principle to 'explain away' a distinction which is experientially impossible .Social confirmation does not constitute proof of an independently existing reality.

In other words, if we take seriously the fact that in the experiential domain this distinction is impossible, then it follows that we cannot cannot rely- for the validation of our arguments - on any assumption that entails having a privileged or direct access to 'outside' objects. The external object cannot be the source of validation for what we say. Hence, Maturana sees the assumption of an objective reality as a "miss-take", i.e. erroneously taking as independent of us entities which we ourselves bring forth. The willingness to make this miss-take he finds to be based on a search for certainty. However he warns that "certainty blinds, the more certainty the less you see".

Instead of certainty we need social coherence. This is for example what science is. Every ideology, game, club etc. is a domain of social coherences defined by the consensus criteria for acceptability of statements.

> " Coherence and harmony in relations and interactions
> between the members of a human social system are due
> to the coherence and harmony of their growth in it, in an
> ongoing social learning which their own social (linguistic)
> operation defines and which is possible thanks to the
> genetic and ontogenetic processes that permit structural
> plasticity of the members." (1987, p.199)

In abandoning the certainty of having a privileged access to objective reality Maturana puts objectivity into parentheses, thus (objectivity). In this way we have two very different explanatory pathways which he refers to as

a) The path of objectivity without parentheses (= the way of the Transcendental Ontologies), and
b) The path of objectivity in parentheses (= the way of the Constitutive Ontologies).

In the first way the observer assumes that existence takes place independently of what he does, that objects have independent and separate existence, and that these can be known directly through processes of perceiving and reasoning. The criteria for acceptability of the truth of statements refers to some independently existing source of validation (e.g. God, rationality etc.).

This way of explaining necessitates the observer to further assume a single reality , a Universe (the Transcendental referent) which is the source of validation for all explanations, and hence for the way we explain our praxis of living. Disagreements among competing observer explanations necessarily involve claims of privileged access to what is 'really real' and consequent mutual negation.

In following the second path the observer assumes, quite differently, that the starting point must be the constitutive biological phenomena of being unable to distinguish perception from illusion in daily living. In the absence of being able to make statements about independently existing objects to which one has privileged access, this pathway focuses on the ontology of the observer, on what the observer does to bring forth objects in a domain of existence through consensual operations of distinction. The criteria for acceptability of statements shifts therefore to observer community agreements and away from objectivity. Both 'objects' and 'domains of existence' depend upon the observer. Thus the observer is the source of all realities and existences and can bring forth many different legitimate domains of reality through the operational coherences of his praxis of living.

While the universum is the ultimate reference cited for the validity of any statement in the transcendental path, the Multiversa is entailed by the parenthetic path, and implies that a multiplicity of realities can be brought forth depending only on the distinctions of the observer.

" each versum of the multiversa is equally valid if not equally pleasant to be part of, and disagreements between observers, when they arise not from trivial logical mistakes within the same versum, but from the observers standing in different versa, will have to be solved ...through the generation of a common versum through coexistence in mutual acceptance. In the multiversa coexistence demands consensus, that is, common knowledge." (p.14, 1986).

The social consequences of both positions are completely different.

At this point it should be clear that for Maturana there is no objectively existing reality. Whatever reality we experience it is one of our own creation, i.e. we bring it forth through our operations of distinction. For Einstein, scientific theories were seen as the free creations of the human mind which we used to explain the world - but for Maturana, what needs explaining is precisely this "free creation of the human mind", i.e. the way in which the observer brings forth his world. Thus, central to Maturana's theory is the ontology of the observer. "Languaging takes place in the happening of living of the observer. To explain languaging, I must explain the living of the observer". Languaging is therefore Maturana's instrument for explanation and also his central problem.

Operations of Distinction -

Q. What is an 'Observer'?
A. An observer is any being who can be in language speaking with another (or to himself) and making distinctions.

Q. What does an observer do?
A. He makes distinctions.

Q. What is a distinction?
A. Any operation that we may enact which results in the separation of an entity from a background, i.e. which simultaneously distinguishes a unity in its domain of existence. Thus we see that the existence of all phenomena is brought forth through making the appropriate operations of distinction. For example, I may bring forth a chair by making the operation of distinction of 'sitting-down'. To give another example, if we want to know how many people there are in a room we will make the operation of distinction of counting them.

We may distinguish two types of unity or system , namely a Simple Unity or a Composite Unity. When we bring forth a Simple Unity we bring forth an entity characterised as separable from its domain of existence in terms of its properties. It is totally characterised by its properties which distinguish it from its background, [i.e. we don't analyse it or decompose it] Its properties are the dimensions that specify or characterise its distinction from all else. These properties arise because they are constitutive.

With the composite unity we do something more. Firstly, we distinguish a simple unity and then we decompose it and separate its components and relations. In the Universe we would claim that the composite unity composed itself, independently of us and what we do. We would assume that the components were either there or not there, and that its characteristics were intrinsic, inherent and eternal. However, in the multiverse it is we who separate out the components and when we do this, we find that the components we bring forth have a peculiar relationship with the simple unity that they integrate, i.e. we say that the "whole is greater than the sum of its parts". Maturana finds this expression somewhat obscure because it does not reveal what this "greater" is which is brought forth.

What is meant is that the composing of this unity takes place in a very peculiar and particular manner and that this is to do with the relations which the components must hold between them so that they constitute the original simple unity that we have decomposed.

Complementary Relationship between Components and Unity:

Note that the components are components only to the extent that they compose the composite unity. That is to say, a component is a component only as a component. There are no free (spare) components hanging about the world. Nothing is a such a component. Something is a component only in composition. In composition the relation between components and the unity that they

compose is always unique - they are complementary. It is to this that Maturana refers when he makes his distinction between the Organization and the Structure of a system.

Composite unities have Organization and Structure. Organization refers to the manner of composition that defines the unity. Organisation refers only to the relations between components that must always be present so that the composite unity will be a unity of a particular type. Organization refers to those relations which when present identify the unity as a particular type. Hence, the Organization of a system is necessarily invariant because if you change it you create something else. If the relations that constitute the unity changes, the identity of the unity changes.

Forgers understand this principle very well because in trying to present a painting as a 'Renoir' what they do is to carefully maintain as invariant as possible (as resistant to scrutiny as possible) those critical relations (brushstrokes, texturing etc.) among specified components (colours, oils, aged canvas etc.) which will identify it as that class of production called 'Renoir'. Experts attempt to distinguish fakes" and "the genuine article" by decomposing the artistic unity into its components and relations. The artist's "style" is that peculiar way in which he composed the constituent parts. The way he organised his painting. This Organization must remain invariant for the unity to conserve its class identity.

'Structure' refers to the actual components and the actual relations that realise a particular composite unity. While the organization is necessarily invariant (to conserve identity) structure is not. Structure is in continual change. Structure entails many more dimensions, more relations than organization. Organization can therefore be seen to be a subset of structure. The Organization is always realised through Structure. We all structurally change continuously in our co-drifting. Living is a structural drift and lasts as long as Organization and correspondence with the medium is conserved.

Whenever we have a composite unity we have an organisation that defines that unity as being of a particular class and we also have structure which refers to the actual manner in which that particular unity is material-ised.

There are two types of structural changes possible: -

1- Changes where the organizational invariance is conserved	2- Changes without conservation of organisation

A living system will last as long as its organisation is conserved and as long as it can be realised in its domain of existence. The structure of a system specifies the following four domains:

1) Domain of changes of state; all possible structural changes which the system can encompass while at the same time conserving its organisation.
2) Domain of disintegrative changes; all structural changes a system can undergo but where the organisation is destroyed.
3) Domain of perturbations; all interactions which trigger changes of state.

4) Domain of disintegrative interactions; all perturbations which trigger destructive changes in the system (loss of organisation).

Since systems are endlessly structurally changing these four domains are never fixed for all time but will change congruent with the changes of the system. Also, since there is this peculiar relation of composition between the components and the unity that they constitute, it follows that whatever properties that a composite unity has depends on how it is composed and hence depends on its Organization and Structure. Further, since Organization is realised (or material-ised) only through Structure, it depends on the actual Structural configurations of that unity. So, Composite Unities are unities whose characteristics depend on their Structure i.e. depend on how they are made!

Much of the aesthetic and constructivist concerns here can be seen in the early writings of Vico whose 'verum-factum' principle - that what is true is what we ourselves have made or constructed - went alongside his vision of the nature of the human mind as that "..which rejoices in the highest degree in that which forms a unity, comes together, falls into its proper place;...that just as beauty is the due proportion of the members, first each to each and secondly as a whole, in any outstandingly lovely body, so knowledge should be considered as neither more nor less than the beauty of the human mind..."(P 239,1732).

To summarise to this point we have the following: -

(1) The observer arises with languaging.
(2) Languaging becomes part of our medium.
(3) Our co-ontogenic structural drift is contingent on languaging.
(4) Languaging interactions are powerful perturbations.
(5) These trigger structural changes.
(6) We cannot control or predict our structural drift.
(7) Prior to languaging there are no objects.
(8) Objects obscure the operations of distinction they stand for.
(9) Objects appear therefore to exist independently of our operations of distinction, of our bringing them forth.
(10) It is constitutive that we cannot distinguish an illusion from a perception.
(11) The central issue for Maturana therefore is the ontology of the observer.
(12) We must move away from the delusory 'certainty' of the Uni-verse to the freedom of the Multiverse.

To further summarise we also have the following:-

(1) By making operations of distinction we can specify simple unities and composite unities.
(2) A Composite unity may be decomposed into distinguishable components.
(3) Such components only exist as components to the extent that they compose the composite unity.
(4) There is a particular relation of composition between the components and the unity they constitute.
(5) This concerns the relations that must obtain between the components in order to constitute the simple unity.

(6) These relations are the Organization of the system.
(7) This is distinguished from the Structure of the system which refers to the actual components and their actual relations which realise the organization.
(8) Organization is necessarily invariant, while structure continually changes.
(9) There are two types of Structural change: Firstly: "Changes of State" which conserves organizational invariance. Secondly: "Destructive Changes" which destroys the Organization.
(10) The characteristics of a Composite Unity depend on its Structure.

Brief Example: The Family as a System

For any system there are four initial questions which we may ask:

(1) What type of System is it? How is it defined?
(2) What is its Organisation and Structure ?
(3) Am I interacting with it as a Simple or Composite unity? If I am in the domain in which the system is a simple unity, I interact with the system through its properties as a totality , as a simple unity. However, if I am dealing with a composite unity I can only interact through the properties of the components.
(4) In what ways can I interact with the structure so that I may trigger some change which will either conserve the organisation or will destroy it?

To begin answering these questions in relation to family systems we see that, according to Maturana, families exist as simple unities in a peculiar domain, i.e. a social-descriptive domain. This is a domain in which we do not move or structurally couple. Therefore we interact with the family as a Composite unity, that is, only through its components (individual members).

To further elaborate our beginning questions we look to which relations among these components define it as a family of a particular type, i.e. having a particular oranization. The family organisation brought forth as problematic must be disintegrated so that the members can do something different. So we must look for the network of conversations which contain the relations of constitution of the family. The only way to disintegrate the organization of the system is through interactions which do not pertain to relations of constitution of the system, but rather encounter the components (individuals, meaning systems) in an orthogonal manner (i.e. in a way that does not pertain to the constitution of the system). The way in which the family interacts with the therapist reveals their network of conversations and the interactions they enter into in order to constitute a certain type of system they call 'family'. That is, they reveal their constitutive relations. The complaints from family members arise out of the conflict between (a) the 'passion for being together' and (b) the negative emotions they trigger in one another. The only solution is to destroy one of these conditions. If the family wants to say together then we must change the structures so that the recurrent interactions cannot continue. This means destroying the organisation of the family as found in its networks of conversations.

Since any system must conserve its organisation if it is to remain identifiably the same system, it is obvious that psychotherapy is essentially an anti-social

enterprise geared to the destruction of invariance and traditions.

PART 3 - AND EVERY THING IS STRUCTURE -

By now Maturana's emphasis on Structure is clear.

(1) Organization is realised only through structure.
(2) All psychotherapy must be aimed at structural changes, since it is not possible to change organization directly.
(3) The characteristics of a Composite Unity depend on its structure (how it's made).
(4) Structure continually changes.
(5) Drift is constituted by the moment-to-moment changes in structural interactions in the medium.
(6) Languaging triggers structural changes.
(7) Whatever happens during interactions depends on the system's structure.

This brings us to Maturana's notion of Structure Determinism -

(1) Interactions in the medium only trigger structural changes of composite unities.
(2) The structure of the system fully determines its interactions by specifying the variety of interactions it can undertake.
(3) The structure of the system specifies what it will accept as an interaction and! what will be ignored.
(4) A major implication of these ideas is that "information" does not exist, and that instructional interactions cannot take place. You cannot by acting externally on a system specify what happens in that system.
(5) You can trigger certain changes and you may know what will happen when you do this triggering by knowing the structure of the system but you cannot specify what happens in the system because that is specified or determined in the structure of the system.

Science can only deal with structure-determined systems, with composite entities, i.e. with systems whose structures determine what will happen. [In proposing a generative mechanism as an explanation for the phenomenon to be explained science always proposes a structure-determined entity]

Since we are structure-determined entities, then whatever happens to us is determined by our structures and is never determined by whatever we encounter in our medium . It may be triggered by perturbations but not determined by them"

Maturana gives the example of hitting someone on the head with a hammer. It is not the hammer which determines that you will die, it is the thickness of your skull. If your skull was made of rubber, the hammer would simply bounce off. The notion of instructive interactions belongs in the Universe of linear causality. Maturana quotes the story of King Midas the man with the golden touch who

had asked for this power of instructive interaction . That is, he could determine completely the structure of other systems (from the outside). Maturana points out that the tragedy of Midas was that he could not be an analytic chemist. Midas could not do science because to do science you must claim that the characteristics of the system you analyse depend on the structure of the system and not on what you do to it.

"It is constitutive for science that we can handle only structure-determined systems and that instructive interactions do not take place".

This structure-determinism does not entail predictability. We are determined but not pre-determined. Determinism means that the structural coherences between systems are satisfied.

"Co-ontogenic structural drift takes place as a structure-determined phenomenon because it takes place in the domain of structure of the interacting composite unities".

Thus the Autonomy of the system is paramount. The system can only do what it does at any particular moment of doing. There are no other choices in the system. A system is always in its proper place and cannot be mistaken.

'Structural Coupling' is a term (like adaptation) which is used to refer to the systems structural correspondence with its medium. A structure-determined system is coupled to its domain of existence (medium) as long as its organisation is conserved and also as long as it conserves its congruence with the medium. Survival therefore consists in the simultaneous twin conservation of class identity and adaptation. If one of these conditions is lost then at that moment so is the other one.

From all of this we can see that to speak of a living system implies: -

(1) That this system is a structure-determined dynamic system.
(2) That its organisation is being realised, and
(3) That it is being realised in a domain in which it undergoes reactions which trigger only changes of state (perturbations) (i.e. which retains organizational invariance) and does not undergo destructive interactions.

Maturana defines the living as 'autopoietic'. Autopoiesis is a very particular type of organization characterised be a recursive self-production where it is impossible to distinguish the product, producer or production. It is this recursive self-production which constitutes the so called 'organizational closure' of the living system.

Implications of Maturana's Theory for Psychotherapy -

I will conclude this introduction with some brief and general implications.

1. How should we as therapists describe ourselves and what we do? Since causality is ruled out by virtue of the impossibility of instructive interactions then

we can no longer think of ourselves as 'change agents' who operate on others to directly change them. This is in line with Kelly's ideas on psychotherapy as providing an experimental context within which the person can productively ask questions through actions and thereby reconstitute or reconstruct himself. Furthermore, people do not 'begin' to change just because they have arrived in therapy, people are in the flux of change continuously. We must get into a co-ontogenic structural drift with the client but we cannot control this drift. The structural changes which arise in all the persons undergoing a co-ontogenic drift have particular implications for the therapist who is not excepted from these unpredictable transformations.

2. 'The system can only do what it does', means that the system can only learn what it is set up to learn. Teachers, for example, are familiar with the difficulty of trying to give "information" or "answers" to children who have no "questions" about the issue which happens to have importance for the teacher. Whenever we say "I find it difficult to hold his interest" we are in this domain of answers without questions.

3.,For therapists believing that there is a 'right' way for the complainant to become and a 'right' way for therapists to behave in order to get him there, then Maturana's concept of the miss-taken nature of independently existing entities, such as a 'proper way to behave', forces you to move towards the Multiverse. Within the (objectivity) of the Multiverse and the concomitant need to validate statements through criteria of social consensuality, we can no longer usefully speak of the 'reality principle' or 'reality testing', but must speak in terms of 'participation in the construction of consensuality'.

4. Equally, since we exist as multi-selves in multi-verses then there is no 'right outcome' for psychotherapy, since there is no 'natural nature' for us to reach or achieve. In effect the emphasis shifts from getting the client 'back on his feet again' to triggering movement within the client system. A shift from 'problem-solving' to active participation in the creation of the observer-community coherences and to changes in co-ontogenic structural drift.

5. Individual responsibility becomes the centre of attention within the framework of 'everything said is said by an observer' and that 'no-thing exists without an observer'. That is, we are fully responsible for what we bring forth in our lives. Events have no separate existence apart from our distinguishing them in words and symbols.

6. Related to this idea of the organizational closure of the observer is the fact that everything is necessarily transference. (Hence it's not something to be 'cured'). While Kelly would say that an observers constructions say more about himself than about the events he is describing, Maturana goes further and says that the observer's utterances can only be a commentary about the observers own organisationally closed system. The closure of the system determines everything through system structure.

7. For family therapy there is now even more of a dilemma to define what 'family' means. When a family presents for therapy there are as many families sitting in your consulting room as there are observer/participants. Each person will describe the family he brings forth differently. The therapist's

descriptions/diagnosis is just one more set of observer distinctions bringing forth a system in a domain of existence. It is important to note that it is not the one (same) family which is being variously interpreted or construed by each individual observer. Rather, each observer brings forth a different reality by his operations of distinction. From the therapist's point of view he will distinguish what he regards as the structural dynamics which are constitutive of the family and to which each member contributes from his repertoire of multi-selves. It is through the redundant dimensions (i.e. those not constitutive of the family system) that the therapist must orthogonally interact. Furthermore, we cannot have a "family problem" since the 'family' can't speak (since it has no mouth). It is the individual speaker who complains and who constructs (or invents, or brings forth) the 'problem' through his languaging. Thus the processes of languaging brings forth an 'object' which is the family problematique and which becomes solidified as 'a problem-family'. This object obscures the operations of distinction which all the family members coordinate in, in order to continuously re-create the problem. Thus the family (and all families) have a problematique, i.e. an a priori set of starting conditions, which are never brought into question and which form the basis of the conversations which in turn material-ise the family organization.

8. Aetiology (in terms of specifying causes for the development of problems) becomes irrelevant since simple linear cause-effect statements can only be a trivialization of the person's entire history of co-ontogenic structural drift. Outside languaging "there are no starts or stops, beginnings or ends, causes or effects". Different observers, through different operations of distinction, will bring forth different 'pathologies'. 'Pathology' is in the eye of the beholder, who is an observer with specific intents, and who operates within the consensual confines of his own observer community. Thus there is no "cause" we can usefully "discover" for anorexia. Such a search must remain an attempt to be reductionistic regarding the anorexics history (reducing it to a set of abstracted professional constructs or category of explanation). Anorexia is the situation reached by the sum total history to date of her co-ontogenic structural drift).

9. Maturana's theory also indicates that we must abandon causal concepts such as those of the "purpose" of symptoms: the "function" of disorders: the "resistance" of this complainant etc. All of these are attributions of an observer. As Kelly pointed out the notion of 'resistance' has more to do with the puzzlement of the therapist than with the obduracy of the client.

CONCLUDING COMMENTS -

One of the greatest concerns in psychotherapy is how to generate enough space for the creative positioning of experiential explorations within the domain of therapeutic conversations, so that it becomes possible for the client system to spontaneously produce novel experience inconsistent with the frame of the client's problematique. From Maturana's theory we can abstract three very potent constructs which allow the therapist to do exactly this. While their abstraction from his theory is easy, their implementation is not and many therapists need to continually have observers of their conversationalist praxis with clients in order to successfully enact these three principles for the

generation of space for novelty. These three are as follows:

ORTHOGONALITY: To be orthogonal means to interact with the client system in such a way as to not become enmeshed in the existing organization of the system as yet one more constituting component. When this occurs you become part of the problem and hence cannot be part of a solution. Acting orthogonally means selectively interacting with peripheral structure, i.e. components which are not actively involved in the constitution of the organization. The 'alien' nature of the therapist as a provoking stranger must therefore be conserved. Orthogonality is focused primarily in the experiential domain where the individual refuses to intersect in relations of constitution of the problematique of another individual.

PARENTHESISING : This clearly emerges from Maturana's theory concerning the ontology of the observer and underlying the fact that no objective reality exists independently of some observer. This view moves us to bracket or parenthesise all speaking and listening, all explanations, all descriptions, and to keep in the foreground the phenomenon of how objects come to obscure the operations of distinction of some observer who enacts these from a particular vantage point and with a particular intent. Wide-scale opportunities for the application of this principle can be found in the domain of referential objects, i.e. those objects (facts) which constitute what Waddington (1977) humorously called C.O.W.D.U.N.G., namely, the Conventional Wisdom of the Dominant Group. In other words, to be parenthetic is to deconstruct the unquestioned and apparently unquestionable reality of a given observer community.

CIRCULARITY: This principle we may derive from Maturana's emphasis on structure-determinism, and on the circularity and recursiveness of all organizationally closed systems. This moves us away from simplistic linear cause-effect sequences and towards the generation and appreciation of complexity and autonomy. Thus the elaboration of the original complaint-complainants network of conversations is conducted by many family therapists using a method of 'circular questioning'. This obviously occurs in the domain of conversational interactions. There are several complex aspects to the application of these three principles, but to select one of the most important as my final comment here I will say the following. Acting in orthogonal, parenthetic, and circular modes can be seen to be a necessary approach to deconstructing various forms of authority to which we otherwise make ourselves subject, and thereby help to generate obscurity and constriction within the three domains. Our possible personal experiential space, our actual social conversational interactions, and our unquestioned reality-fabric can, and must, all be radically elaborated, and transformed by a thoroughgoing involvement and embodiment of the notions of being experientially orthogonal, conversationally circular, and referentially parenthetic.

Orthogonality asserts individual autonomy and simultaneously brings into question the problematique of another. Circularity asserts system autonomy (the larger whole) and simultaneously questions simplifications and the notion that some one person has the authority or vision to really know best what is going on. Parenthesising asserts the creative autonomy of alternativism and simultaneously questions and undermines the invariance of pre-emptive past laws or rules for specifying reality. All three expand the flexibility of each domain

and the possibilities of what may transpire within each. Finally, we may note a correspondence between the experiential domain and structure-determinism, the conversational domain and the Multiversa, and the referential domain and the ontology of the observer.

REFERENCES

LAO TSU (1972). TAO TE CHING. (London: Wildwood House).

MATURANA, H. R. (1986). The Biological Foundations of Self Consciousness and the Physical Domain of Existence. (Unpublished Manuscript).

MATURANA, H.R. (1988). Reality; The Search for Objectivity or the Quest for a Compelling Argument. Irish Journal of Psychology, Special Issue on "Radical Constructivism, Autopoiesis and Psychotherapy", Vincent Kenny (ed.), Volume 9, no. 1.pp25-82.

MATURANA, H.R. AND VARELA, F.J. (1987). **THE TREE OF KNOWLEDGE.** (New Science Library; Boston).

SEARLE, J. (1969).**SPEECH ACTS.** (Cambridge: CUP).

VARELA, F.J. (1981).**DESCRIBING THE LOGIC OF THE LIVING.** In Zeleny, M.(ed.), Autopoiesis; A theory of living organization. (Oxford: North Holland).

VICO, G.(1732). **ON THE HEROIC MIND.** Published in Tagliacozzo, G., Mooney, M., and Verene, D.P. (eds.), Vico and Contemporary Thought,(1976), (Atlantic Highlands: Humanities Press).

WADDINGTON, C.H.(1977). **TOOLS FOR THOUGHT.** (Herts: Paladin).

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