

(MOSTLY
WESTEASTERN-EUROPEAN
THEORETICAL BLABLA-)
LEGO FOR A META-THEORY
OF-META-ART-FO

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THE RE is air in my room. I am happy to work for Runme-Dorkbot-City 2004 as it will take me to Aarhus, a city I know. I was born just 2 hours by car to the south - in Neumünster, Northern Germany. The country of Nazis and denazification, of Goethe and Mercedes. Now a country in Europe — welcome back. I read Goethe there and built Mercedes cars in the summer time to earn the money for an American guitar with *piezo* stereo pick-ups. That was 1986 and I was 19 years old. The summers of my childhood were, however, unaffected by technology questions. The living was easy. So I always nurtured and defended to myself and others the crush that I had on Denmark and Sweden. For my first 14 years on earth the whole family spent the summers there, never less than 6 weeks in a row. Denmark and Sweden are sunny and the people are relaxed, sharing a lot of space, with many of the islands having hide-aways. The people appear even more charming when they express their love and affection of being Danish or Swedish. They play with *Lego*, eat butter cakes and salty liquorice and their fishing trawlers go “fump fump fump” at sunrise (before you really wake up) with a slow yet powerful rhythm that I associate with the music that happy and sovereign machines would play for their owners. Their folklore, and its celebration of work, is life-loving and its lyrics and melody are not overly melancholic. There is no living tradition of German folklore and I didn’t meet the first real Jewish person until I was 23 years old, in Israel. Denmark and Sweden are comparably small nations

in the big MishMash and it's hard for me to remember their nasty imperialistic times. So I love to leave Vienna and come back. To meet all the *BlaBlas* and *ClickClicks*. I need a vacation to space. I need another air, another sound once in a while to go on. I am now 37 years of age. And they even announced there will be a campfire...

Space and Positions

Obviously, this essay starts with space, my space, and will be concentrating on a complex of theoretical positions that originated in the United States in 1949, but whose tendencies were heavily influenced by post-war immigrants from Europe and South-America. I am interested in interlacing the constituent elements of the group with their respective historical and geographic journeys through the last five decades. Only the first of these will be dealt with in some detail (Heinz von Foerster, George Spencer-Brown, Gotthard Günther), the second being discussed in terms of System Theory and German sociology of the 70s, 80s and 90s (Humberto Maturana, Niklas Luhman) and its traces in Peter Sloterdijk's recent philosophical theory of Humanly Generated Spaces (spheres). I will try to avoid, where possible, confusing content, terminology and style, especially as one of the key values of most of these thinkers is *politeness*. Their reasons for trying to be *polite* are, however, not always easy to understand.

Runme — Motivation

During the last year I have had the chance to get to know several artists and writers who in my eyes already have the potential to contribute to something like a theory of "software art", yet there seems to be a lack of *LEGO*, and consequently no playground. I decided to label this field and its works a *Meta-Art-Form* for the time being as it is not crafted in ateliers, is not produced in analog environments, the teams are not educated in art academies, the works can't be originals though they can be signed, museums are not the main venue to visit their exhibitions, and the concepts

and zones of invention and intervention can obviously not be categorized yet — successful projects have appeared in activist or interactional, visual- and audio-oriented, text- and code-based, conceptual and performative, community-building and hermetic contexts; payed by the white cube, done in the still of the night round the globe, crafted in 7 minutes or prepared for months. A vacuum of *LEGO* became visible to me as well while watching the programming of big festivals and during discussions with both old sheriffs and new outlaws of hacking and media art. Another striking feature of these discussions were, to my eyes at least, gaps in the intellectual landscapes of, lets say, French, German, Anglo-American and *Eastern* perspectives on theory, and on the social and factual significance one expects theory to have. So I decided to go *open source* with some positions I have become acquainted with over the last decade. I do so for several reasons : they might have fascinated me, bored me or even aroused my anger at one point of time — but that was not the main criteria to choose them. They have been chosen because I think their traditional fluid is provoking and inspiring for artists and programmers alike.

Theory-Making & Programming

Lets start out with some basics I would associate with theory-making: The history of ideas consists of THEORIES — about the psychology of the human imagination or the functions of the brain, about matter and nature, about the nature of human work, about the development of religious and secular world-views, about the rise and decline of Indian or European culture, about the interaction between people and machines, about the interaction between women and men, about the generation of space and power, etc. So every theory can to some degree be characterized by its main subject, its volatile and stable attributes as it changes in time, and the way it interacts with other theories if challenged. If SOFTWARE or SOFTWARE ART and their perspectives on artistic and liberatory change are to become a theory's main subject, its constituent

theoretical elements of theory of history, the theory of information, the theory of labour and culture, the theory of aesthetics and, last but not least, gender theories, must experience a radical reconstellation. Now for the positions, presented here for people from other fields of expertise. I hope they have the potential to build a (serious) playground with your own positions and *LEGO*, and give rise to something new...

From Wittgenstein's Nephew to Observing Observers — Heinz von Foerster¹

*(Lego: Macy-Conferences, Blind Spot, Observing Systems/
Cybernetic of Second Order/ Trivial Machines/
Untrivial Machines)*

It all started here in Vienna when Heinz von Foerster and his young wife and children were looking for an apartment after World War II. He was then asked a *typical Austrian question*: “In order to get an apartment — which of the two parties do you belong to, the (socialist) SPÖ or the (conservative) ÖVP?” The family extrapolated from this phenomena that life was not worth living in such a binarized social environment and decided to immediately immigrate to the United States. This ability to move paid off in several respects. There, von Foerster's first job was to edit and publish the *Josiah Macy, Jr.- Conferences*. These were held in New York (from 1946 till 1953) and turned out to be a decisive influence on the development of *Cybernetics*, especially in their transdisciplinary architecture:

- biologists (like Humberto Maturana, we will hear more of him) met
- neurophysiologists (like Warren Sturgis McCulloch, really a philosopher and psychologist by education who viewed the neuron as being the basic logical unit of the brain, which he researched later at the *Massachusetts Institute for Technology* called *MIT*),
- economists (like Oskar Morgenstern, the co-inventor of Game Theory in the late 20s) met
- mathematicians (like Norbert Wiener, who actually coined the term *Cybernetics*) who met

- anthropologists (like Margret Mead, one of the first to look at human development in a truly cross-cultural perspective; or Gregory Bateson, her husband and inventor of the Double-Bind-theory)... and others met others.

Ten conferences were held in a row resulting in allegedly the most influential scientific event after World War II. It had an impact on neurologists, sociologists, linguists, computer scientists, psychotherapists, political scientists and others. The theme is interesting and I suggest that everyone learn the title by heart:

Cybernetics. Circular Casual, and Feedback Mechanisms in Biological and Social Systems—its aim was nothing less than the development of a universal terminology that could describe and realize regulation and control *in machines and living entities*, political or psychological processes, sociological or esthetical phenomena, alike. Also present was John von Neumann, the brilliant mathematician from Budapest who invented computation founded on the binary system, and the storage of programs in code instead of on punchcards. His logical design of the IAS (Ideal Access Structure) became the prototype of most of its successors — the *von Neumann Architecture*.² Some new terms that were coined in the *Macy-Conferences* are *information, analog / digital* and *feedback*.³

As the editor, Heinz von Foerster had contact to all this material on a daily basis till 1955. Two years later he started to develop his own *Biological Computer Laboratory* at the *University of Illinois*. The hospitality and spontaneity of his wife and himself made their private home something like an extension of the *Macy-Conferences* as scientists from all disciplines would bump into each other unexpectedly there. Heinz von Foerster, himself a passionate magician in his spare time, had observed something like a *blind-spot* in the material and approach of the *Macy-Conferences*. They were gathering knowledge about *systems*, be they mechanic, organic or cognitive systems, without considering the fact that they, the scientists, were themselves *observing themselves, the world and others* all the time. Consequently, this second tier reflection on *Cybernetics* would breed the *Cybernetics of Cybernetics*,⁴ the *regulation and con-*

trol of observing systems instead of *observed systems*. This new field he called *Second Order Cybernetics*. His shift of interest away from the researched, object' or, topic' towards the instruments of analysis would become one of the main influences on the constructivist research emerging in the following years. He preferred to be called a *Cybernetic* (he died in 2002) and his interest in *Observing Systems* led to research on the nature of cybernetic societies and its archives, and in paedagogics.

“If the observer would not have been discovered, one would have had to invent him. The observer is the condition for the reduction in chance that self-referentially operating systems could still be portrayed like *Trivial Machines* dependably giving the same output for an input. (...)... they are indeterminable and unpredictable. The reason might be surprising: They are indeterminable and unpredictable because they have a history too, which they constantly refer to and that will never be fully at any observers disposal, let alone to a given time. The fatal distinction between subject and object (here: the observing system being observed, L.F.) is blown up by conceiving the object itself as forming the basis of itself—and hence being the subject.”⁵

Heinz von Foerster was a very lively character who loved nature and buying fashion magazines for his wife. He died in 2002.

Excursion / Digression:

The list of all English translations offered for my beloved old philosophical German term *Gegenstand* (literally translated contra-stand) seems to support von Foerster and especially Maturana in their views of language and cognition and put into a nutshell the most necessary semantic ingredients for the understanding of a century-long philosophical quarrel between constructivism and realism. The list of translations for ‘Gegenstand’ goes like this : ‘matter’, ‘object’, ‘item’, ‘topic’, ‘article’, ‘subject matter’, ‘subject-matter’, ‘subject’, ‘artifact’, ‘purpose’(listed from realism to constructivism).

From Drawing to Drawing a Dis

At the foundation of Laws of *tion*. Here is a distinction: “Nothing there. That is because the viewing frame. The break space, thereby highlighting it. frame and recognize the nothing frame itself. In considering that from being inside of the distinction here we studied its spatial form is also a distinction. In one case step out. Now let’s collapse the content of the frame the same the website to see the *collapse*,

tion — George Spence Brown⁶

Form is the concept of *distinction* that there’s the distinction lies in the text surrounds empty You naturally see through this thing inside of it, rather than the frame, we did a context shift course to being outside of it, we m. This change of perspective case we step in, in the other case use two distinctions by making same as its context.” (please visit L.F.)⁷

(LEGO: Laws of Form / Observing / Unmarked Space /

Drawing a Distinction / Pro Paradox / Imaginary Logic / Megalomania)

In 1967, (the year I was born in Neumünster), the English logician, philosopher, computer scientist, psychotherapist, George Spencer-Brown approached the world-famous analytical philosopher Bertrand Russell. Not only had he studied with Ludwig Wittgenstein in Cambridge, he had, since 1960, been working with Russell on *Foundations in Mathematics*.⁸ Spencer-Brown showed Russell a logical calculus whose aim was to render unnecessary Russell’s most famous *logical* or *set-theoretical paradox*, published way back in 1910 in the *Principia Mathematica*.⁹ “The paradox arises within naive set theory by considering the set of all sets that are not members of themselves. Such a set appears to be a member of itself if and only if it is not a member of itself, hence the paradox.”¹⁰ Russell had thus imposed a ban on self-referential sentences because *the self-containment of a class as its own element* is seen to be *logically illegitimate*. But the make-up of Spencer-Brown’s calculus seemed to imply the contrary: “Russell was impressed and congratulated him.”¹¹

Not only was von Foerster among the first to see the possible significance of Spencer-Brown's approach, he even helped him to get it published (1969).¹² There is, however, a certain cluelessness in the scientific community of System Theory and Constructivism that survives up to today, as to what *Laws of Form* is actually about and why it was somehow influential, resulting in a lack of clear conclusions being drawn from it.

I will thus try to profile both sides of this ambivalence of reception: on the one hand the basic theorem of *Laws of Form* from Heinz von Foerster's perspective, and on the other, the freaky and hyper-scientific aspects of Mr. Spencer-Brown's introspection, that is: self-awareness. The man is, by the way, now 81 years of age and can be called on the phone (+ 44 1985 844 855).¹³

A. *Observing is Drawing a Distinction*

Observing is, according to his approach, impossible without *making distinctions*. Spencer-Brown, being the son of a painter and an experienced painter himself, gives this insight another twist by saying: *drawing a distinction*. One might know from one's own experience that today's painting practices are actually neither a silent nor necessarily peaceful form of art. Any *observation*, he goes on, will thus hurt a formerly *unmarked space*. Yet the result is not at all one of a *distinction between knowledge and non-knowledge*, as if they were the *two sides of a coin*. On the contrary, the former unity (of what is now distinct) is made invisible and the observing system operates as a "recursion in the sense of a re-entry of functions as arguments of themselves" into the system, "primary arguments, if there are any, make room for *eigenvalues*, that are confirmed by any new step of the circular process as long as it operates."¹⁴

Von Foerster would — for an explanation on a technical, formal, that means mostly *mathematical* level — mention the *extraction of the square root from any given number* as an example, because you start anywhere and then approximate the number 1 — the *eigenvalue* is generated independently from any *initial value* (or *random seed*).¹⁵ "This is unthinkable in the natural sciences, whose most prominent law is 'objectivity'. Objectivity demands that the characteristics of the

observer must not interfere with the descriptions of his observations."¹⁶

"The *Laws of Form* dissolve problems of paradox in Philosophy in a 'disquiting yet admirable manner', as Bertrand Russel attested, by showing that the paradox is an integral part of any act of perception and description. Paradoxes are thus de-mystified. They don't have to be avoided, as Russel had suggested, but can be understood as a necessary constituent of our existence."¹⁷

Question:

But how can one apply results and conclusions like these, drawn from disciplines like formal logic and maths, so they are significant for our experience of everyday life?!

This shift from the abstract, logical and formal realm to the physical, experiential and existential is an issue as old as philosophy itself. Anyway, Heinz von Forster, convinced that the *Cybernetics of*

Cybernetics would have to bridge this chasm anew, and with new approaches, applied the theory to the behaviour of a child that is just starting to interact with a ball. Through the repeated interaction of the action of the child with the reactions of the ball the child gains a specific motor competence, it creates a reality, so to say, in which the ball and itself are part of a shared competence of behaviour. The child is thus not only perceiving the ball through observing and touching it, it is constructing its own perception of reality through its interaction with the ball, something that could not have been observed at the outset. This fairly constant idea of what *this something* — the ball — actually is, is not a given but is produced by the process. As a result, the perception of "ball" has become an *eigenvalue*. (= and a new Maradonna might arise).

The processing of *eigenvalues* can be observed between couples as well: "The other ... (can be) ... one of my *eigenvalues*, one of my competences of behaviour. The essential new outcome here is the closing of the circle of a 'Me-and-You'-relationship: because as the

other has become one of my eigenvalues, my competence of behaviour, I have become an eigenvalue as well, a competence of behaviour of the other. 'Me' and 'You' create each other, nobody emerges without the other, or, put into other words, you look at yourself with the eyes of the other."¹⁸

But to what extent is this merely a personal, *Foersterian* deduction from Spencer-Brown's

Laws of Form?

B. "1991: John Barger visits George Spencer-Brown in London, turned off by megalomania"¹⁹

I do not know John Barger personally, but I think I can understand his observation: In 1971, only two years after his supposedly epochal breakthrough in formal logic, Spencer-Brown himself published a book entitled "Only two can play this game".²⁰ According to von Foerster, he 'lost his eyes' for a while in a love affair with an Asian student that went wrong. The book has been described as a "comparison of Western and Eastern modes of thought and methods in the arts, philosophy, religion, and the sciences"²¹. There, Spencer-Brown blamed his own patriarchal Jewish-Christian tradition for its imbalanced domination over the female. He extrapolates from this dominance a global self-suicidal tendency in ecology, biology and social life — and gives a radical solution (which I will not reveal here).

As an observer one might ask: *Is the whole world really the reason for the development of this personal tragedy?* Is the creator of *Laws of Form* a minimalist when it comes to form-entry and a maximalist in wisdom-output? A certain Jeff James wrote in 1994: "A fourth preface was added (to *Laws of Form*, L.F.) in which he talks about 'triunions' or 'triple identities' such as of reality, appearance and awareness, or imaginability, possibility and actuality, or what a thing is, what it isn't and the boundary between them. He acknowledges that Sakyamuni (the Buddha) is 'the only other author who evidently discovered these laws.' He invites the reader to join a siblinehood and help found a school of his methods for intuitively feeling and naturally acting upon the consequences of

there being nothing. He calls the method and the siblinghood 'tarati'. An extradition was also added in which he claims to be, since before he could talk, a liberated being with unlimited thinking, superior to Bach, Mozart, Newton and Gauss, and asks for money and volunteers to help him found schools for superintelligent children such as he was."²²

Here I observe an extraordinary structural intelligence trying to get in contact with "the world" after many emotional tragedies. On the other hand: There is also *software art* available by Jeff James that operates the visualisation of the behaviour of the 'imaginary logic values' Spencer-Brown had conceived. I may begin to sense why Mr. Spencer-Brown has put his phone number on the web — one might take this as an opportunity to invite him for a campfire-night with Media Artists and other people *doing strange things with mathematics and electronics*. In August.

In Aarhus. What will one learn from it?

Maybe a lot. It (obviously) depends on what we are able to observe.²³

From studying Sinology to designing the Transputer — Gotthard Günther²⁴

*(LEGO: Non-Aristotelian Logic / Polycontexturality /
Three-Valued Logic — Multi-valued Logik /
Science Fiction / Transputer)*

The next deliverer of further (mostly East-Western-European) *Lego* from the United States was born on the 15th of June, 1900 in Arnsdorf, Silesia. Eleven weeks after his birth Friedrich Nietzsche died after a long sickness, another son of a protestant pastor.²⁵

"... Influenced by Prussian mentality, the young Gotthard Günther systematically started to plan his studies of philosophy. Because of the fact that the development of the Eastern cultures started 400 years before the Greek, it was obvious for him to begin with Sanscrit, indology and sinology." But as he realizes "the striving for exactness within the occidental philosophy", the Asian philosophies gradually fall away as his main focus of interest." Questioned in an interview in 1983, as to why he did not per-

severe with oriental philosophy, Günther replied: “Because besides all their metaphysics, mathematically the Indians did not create anything out of their epoch-making discovery of the null (*number zero, L.F.*), but Western technology did.”²⁶

The drive of his “frontier qualities” — as such an attitude would be called in American culture — can already be seen in the title of his PHD, published in 1933 (... the year Hitler came to power) : ‘Main Features of a new Thinking in Hegel’s Logic’. “His hallmark, his intellectual break-through” by which he arrived at the “guiding star of his lifework” appeared in the humanities lectures of Eduard Spranger²⁷ in Leipzig. Spranger argued that “all future problems within philosophy have to be related to Hegel’s logic.” And Günther started to work on the validation of this thesis, a project he would maintain his whole life... “According to some critics it is one of the most profound interpretations of the ‘grotesque rocky melody’ — as noted by the young Marx — of Hegel’s thought.” In this book Günther explained that “on the basis of Hegel’s logic a new formalism could be established.”²⁸

Before the War started in 1939 he followed his wife, an academic psychologist of Jewish ancestry who had had to leave the country earlier, first to South-Africa and in 1940 to the USA, where they became citizens 8 years later. By and by the *old European academic* got accustomed to the rhythm and style of the American way of life. After new friends introduced him to *Science Fiction* and to its importance for the American culture, Günther began to admire this genre not only as an expression of the American *frontier spirit* but also as a cultural and literary symptom “of a total flight out of the classical-occidental tradition of thinking.”

“At least for the occident, undoubtedly the very basis of all philosophizing, the laws of thought, are found in logic, developed in ancient Greece, and known as Aristotelian. Its formalization — by the German philosopher and mathematician Gottfried Wilhelm Leibniz and later by the English logician George Boole — finds its strongest manifestation during the 19th and 20th century with- in a multitude of technical applications and is again about to turn

our lives upside-down via computers and the internet. Concerning possible changes to these very laws, the American philosopher Oliver L. Reiser already writes in 1935: ‘If the laws of thought should fall, then the most profound modification in human intellectual life will occur, compared to which the Copernican and Einsteinian revolutions are but sham battles.’²⁹

Hence, and similar to Spencer-Brown, yet more than 3 decades earlier, Günther was challenging a *tabu*, a *paradigm* of scientific logic — the Aristotelian tradition of logic. Not that classical binary Aristotelian logic was to be decomposed totally by this new formalism, but Günther contextualized it as a special case of his more general, comprehensive and *multivalued* logic, that is: in the framework of a *polycontextural logic*. A definition of Rudolf Kaehr, one of the closest students of Günther, reads as follows:

“Polycontextural logic is a many-systems logic, a dissemination of logic, in which the classical logic systems (called *contextures*) are enabled to interplay with each other, resulting in a complexity which is structurally different from the sum of its components. Although introduced historically as an interpretation of many-valued logic, polycontextural logic does not fall into the category of fuzzy or continuous logic or other deviant logical systems. Polycontextural logic offers new formal concepts such as multi-negational and transjunctional operations.”³⁰

So Günther and his team have been working — according to this text — on non-Aristotelian logic that is professionally not to be mistaken with other tendencies in current logical research. But let's try to understand first what is at stake for a trained logician in *polycontexturalizing* traditional logic:

The minimal statement erecting and protecting the function of *binary logic* had been the three axiomatic statements: 1. “a is a” (identity=*true*), 2. “non-a is not a” (contradiction=*true*). 3. “*tertium non datur*” (exclusion of a middle, or third term).

This traditional logic guarantees for our brain the ‘real’ differences between idea and matter, subject and object, and hence idealism and materialism, etc. — and *true* and *false*.

In a schematic manner, the *way-out* of classical logic that Günther tries to formalize can be described as the following logical process:

- simple reflection: *I think of a stone*
That is — an immediate reflection of an objective dimension: the stone.
Here — classical logic applies fully
- double reflection: *I think that I think of a stone*
That is — an immediate reflection of a reflective dimension: the thought of the stone.
Here — transclassical logic applies

“... In other words, the transclassical logic is the reflection of classical logic. For the description of the objective dimension, for which our brain is (already L.F.) programmed, the classical logic stays valid. Because if we apply the transclassical logic directly to reality and not to reflective consciousness we would depict a world ‘in which insanity reigns’. Yet the entire reality according to Günther is something like a conglomerate of an endless number of ‘ontological topoi (places)’, an infinite number of spots of classical rationality, whose interplay cannot be grasped by classical rationality.”³¹

In 1961, Günther was invited to work in Illinois, Urbana, at the Biological Computer Lab where Warren McCulloch and Heinz von Foerster *somehow* understood and appreciated his approach and prompted everybody to get him on the team. Ironically, in the context of *Runme/Dorkbot* at least, they had no other Chair available for this specialist in the philosophy of German Idealism than at the *Department for Electric Engeneering*—so Gotthard Günther was indeed quite officially *doing strange things with electronics* in the BCL! He stayed there till 1972 and worked unceasingly, and with ever changing methods and ideas, at creating a notation for polycontextural logic that could be formally operationalized. Many of his texts and sketches can be visited on the Web.

But I should stress here, his plan to build a *Transputer*, a machine calculating polycontextural logic and therefore (somehow) analogous to the human consciousness. Günther viewed *history* as a process, in which *subjectivity* creates a flux in the form of a *reflection* on/of

objects (to put in-formation) — hence our environments get smarter as we manage to put our abilities into machines more successfully. The *Transputer* was to be an analog of our consciousness in *simple reflection* and *double reflections* — no wonder Günther admired the Science Fiction genre.

And no wonder this sort of project put a chasm between him and the philosophical academic mainstream, “other Hegelians showed nothing more than friendly lack of appreciation for such formalistic experiments, while specialists of formal logic did not even take notice of his work.”... “His border crossings between Hegel and cybernetics, his ideas for an extended rationality, born out of the conviction that life itself is not constructed by following the present laws of human rationality, did not find appreciation in Germany, and nor did his profound critique of Jürgen Habermas ‘*Logik der Sozialwissenschaften*’, which was published in 1968 in the Journal ‘*Soziale Welt*’.”³²

The USA and Western Germany in 1968: “At that time, his argumentation, strictly based on the logical structure of thinking, just could not be understood in Germany.” There the arguments stayed on the surface in Günthers’ eyes, and the discussions within the 68’ students’ movement dealt with “social values, and were conducted rather emotionally, and centered on the digestion of the Third Reich.” In his autobiography, Günther remarked once that he had already adopted “the typical behavior of American cybernetics against philosophy which involves an invincible mistrust in notions which are not realizable in practical models.”³³

That means in return: A *Transputer* has to be built and has to function or the concept continues to belong to the imaginary just like *the thought of a thought of a purple stone of Olga’s squirrel returning home from Past Perfect where it was cold and the square root of the number 1*. Till this day, Gotthard Günther failed to build this machine. In the meantime(,) he died. Recently, I was also told by Friedrich Kittler that one of his closest students, Prof. Rudolf Kaehr, was given a budget by the *Kunsthochschule für Neue Medien Cologne* (KHM) to have another go at the project some years ago.

But this attempt was also unsuccessful, obviously, otherwise we would have heard of it. Now the tricky question: has the project for a *Transputer* actually *failed* or is it merely *unfinished*? Which coder, biologist, philosopher, chip designer, information trainer or maybe gender studies specialist could tell us a convincing reason of why this is thinkable, possible, impossible or unnecessary?

For myself, I tried to come up with an alternative to an answer, a *comparison*: There is a difference between not yet being able to, lets say, construct a hydrogen-driven spaceship, or designing the small brother of the *Transputer*. On the one hand : for the Spaceship, you don't have to study Hegelian logic to be able to believe in it... On the other hand : even a failed research project like the *Transputer* is, I think, more interesting and compelling for Software Art than any identified flying object. The reason for this in my eyes : its make-up is closer, more *analogous* to code and consciousness than the fastest plane on earth.

Between postmodern madness, robot wisdom and the "striving for exactness in the culture of occidental philosophy" seems to be a thin line.

**From chickens at the dinner table to
Radical Constructivism for the sake of Matriarchy —
Humberto Maturana³⁴**

*(LEGO: Autopoiesis / System and Environment /
Coordination of Behaviour, Coordination of Coordination
of Behaviour / Languaging / Emotioning / Structural
Determinism / Radical Constructivism)*

Humberto Maturana is a biologist and was a colleague and friend of both Heinz von Foerster and Gotthard Günther. In Maturana's opinion scientists are people that live for the passion of explaining.

Born in Chile and raised in a 'matriarchal environment of *emotioning*', he once mentioned a story about a special animal he shared some time of his life with: a chicken. During his childhood, this chicken was allowed to live like a family member in his house.

“It would eat with us at lunchtime in the dining room — rest on my shoulders, on my neck. It would defecate on the table that one then had to clean...”. The family had raised it from the egg, and named it *Bigotte* because its feathers looked like Mexican mustaches...”.³⁵ At nightfall the chicken would be sent to the barn to sleep with its own family. Then one night there was a knock on the garden door. Humberto’s mother opened it and told *Bigotte* to go to bed — and closed the door again. Only a few moments afterwards, there was another knock and mother opened up once again, this time however *Bigotte* immediately turned around and was on her way to the barn, thus leading Mrs. Maturana there as well. She soon discovered that one hen had been killed by a big animal and the whole barn was in an uproar.

Now how does one explain this behaviour? Did the chicken want to share its catastrophe with Maturana’s family? And that it was able to do this — was that a *miracle*? An outstanding *super-chicken* of some kind? No, replies Maturana — living systems, chicken and human beings alike, coordinate their behaviour according to their consensual environment while at the same time being structurally determined. *Miracles* are explanations for effects which don’t have the necessary respect for, or knowledge about, *structurally determined systems*. Human beings and chickens live in different relational spaces for mainly one reason : because their *emotioning* is operated through different languages. They do it all their life, normally, and so they have a different phylogenetic (in respect to the evolutionary species) and ontogenetic (in respect to an individual of a species) development. In other words: No *wild* chicken would have done this, but *Bigotte* lived with human beings and they learned from each other different behaviours. “The structure of the system specifies what it will accept as an interaction and what will be ignored. A major implication of these ideas is that (external) “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.”³⁶

“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 comes from 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 structural determinism does not entail predictability. We are determined, but not *pre-determined*. Determinism means that the structural compatibilities between systems are satisfied.

"Co-ontogenic structural drift takes place as a structure-determined phenomenon because it takes place in the domain of the structure of the interacting composite unities."³⁷

Living systems as human beings and living systems as animals may develop other lineages of consensual behaviour if their determining inner structure and their environment interact differently: they may become more creative if their environment is creative, etc. But Bigotte did not "learn" something, "she *just lived with us*."³⁸ The result in this case: human behaviour patterns occur in animal behaviour observed by humans.

Neurons, blood cells, and organs like the heart or the brain are living systems as well, they produce the elements necessary for their survival themselves, maintaining an *autopoiesis* till they die. Human beings (complex assemblies of living systems coordinating their behaviour to form an entity behaving in recursive circles — *sleeping, breakfast, aging*, etc.) have developed their own or special dimension of what they call *reality*. In this they do what they call *existing* by means of the instrument of *language*.

Yet language evolved over many thousands of years. By using *language*, human beings coordinate their own coordinations of consensual

behaviour with other living systems (human beings), who in turn coordinate their own, be they scientists, hackers, fashion models, esoterics, Brahmans, transvestites. *Information* is never transmitted or delivered, if observed carefully it always comes down to coordinations of coordinations of behaviour in *structured couplings* of interaction. That is why Maturana warns to use metaphors in explanatory paths of scientific discourse — they might have an appealing (‘emotioning’) effect on the listeners, yet in the further steps they cause more confusion because of their own *history of emotioning–languageing* they bear with them. You will thus find no metaphors³⁹ in the systematic terminology of his *Theory of Living Systems*, only when he would exemplify.

“Existence does not take place independent of the observer. Existence takes places in the distinctions of the observer.”⁴⁰ So, would Humberto Maturana claim that *science* is an explanatory path as well, created by observers? To put it in extreme terms: Did Newton, in the last resort, *discover* or *invent* the law of gravity? For the epistemological (*what is knowledge and how do we gain, assert and store it?*) position of so-called *Radical Constructivism*, the answer is clear.

From Civil Servant in Hannover to Hegel Prize in Stuttgart

Niklas Luhmann⁴¹

*(LEGO : Talcott Parsons / Theory of Social Systems /
Laws of Form / Autopoiesis / Polycontexturality /
Printed Hypertexts / Politics of Society / Law of Society /
Science of Society / Religion of Society / Economy of
Society / Art of Society / Society of Society / World Society)*

His family had a brewery in the German provinces, but not being the oldest son he chose to study law and to become a civil servant. He went to the USA to study with the functionalist sociologist Talcott Parsons after he had seen an application form on his office desk. He did not like soccer nor was he good at it. He always read theoretical literature, despairing at his inability to memorize it all.

Niklas Luhmann reacted by constructing a systematic filing system of punchcards interlaced so as to contextualize their contents. Yet an important paradox should also be pointed out : from the point of view of *form* and *medium* Luhmann seems to write hypertexts but published only on paper : books and articles.

He was made professor for sociology straight away in 1968, part of the foundation of an innovative university project in Bielefeld, close Hannover. When asked in the following year by the scientific bureaucracy what his research projects were, he responded, Subject?: *Theory of Society*; Duration?: 30 Years; Costs?: *None*.⁴² Actually, he managed to finish one year early, in 1998. The 1164 pages are entitled: *The Society of Society*. The introducing quote is, strangely enough, from Spinoza the author of an allegedly monistic (there is only one substance and differences we perceive are due to our structurally determined systems) philosophy called *The Ethic* in 1677: “Id quod per aliud non potest concipi, per se concipi debet”⁴³ — *What cannot be understood through another, has to be understood through itself*. An epistemological *Brownian Operator*, in the 17th century?

The keystone of Luhmann’s *Theory of Society* is seen today as perhaps *the* theoretical contribution to the future of sociology. Or — *is it?* Luhmanns approach and the effects of reading his texts means that alot of my academic colleagues and students can not (or refuse to) read or understand it. Some that try to and get depressed, some others turn rather arrogant and in both these cases the whole thing is rather unfruitful. Exceptions granted. Very few in my experience.

The stakes are high, however: Luhmann claims that today, in modern society, the possibility has arisen for the first time to actually *observe* society as a system, which means : today, the possibility is there to describe society without wanting something else from it than it is. Many have seen there to be a clearly conservative stance implied. Again, this was 1968 and it is hence not surprising that Jürgen Habermas and him were organizing a controversial debate about *methodology*, so to say: *Theory of Society* or *Technology of the Social* — What is the contribution of the System Theory?

Luhmann constructed his theory on the *Lego* of Spencer-Brown (Laws of Form), Günther (Polycontextuality) and Maturana (Autopoiesis). Quite certainly all these authors would complain about how he has applied their *Lego* in his systemic architecture. He claims that society is made up of *communications*, not of *persons*. Maturana objected this interpretation arguing that one would lose the human being this way, *autopoiesis* should correctly be applied to real living systems that depend directly on material metabolism. It should *not* be directly applied to *social systems* like a theatre group, a family or a political party. But obviously Luhmann observed something (= made his own distinction). He writes about several social systems in modern society that proceed next to each other (to speak metaphorically), rather than ranking from high to lower classes etc. like in the former hierarchical societies.

That does not mean that these social systems *see* or *interact* with the other in essential ways, but they coordinate their communications, we know these terms now, to sustain their *autopoiesis*. The social systems are (and for each Luhmann published a book ranging between 356 to 732 pages): the *Politics of Society*, the *Law of Society*, the *Science of Society*, the *Religion of Society*, the *Economy of Society* and the *Art of Society*. Yes, *Art* is also observable as a system because it obviously is able to communicate its own value from Renaissance up to our alledged *Postmodernity* — regardless of how the notion of such values may have changed over the centuries. It sounds both banal and miraculous to state it, but: art is there! (Or — *is it?*) — and it returns and returns and returns, gets budgets, scandals and exhibition spaces for all kinds of things and thoughts. And maybe as well for the way he could handle the *LEGO* of a biologist, Luhmann was granted, as a sociologist, the *Hegel-Preis* of the City of Stuttgart in 1988.

Though Luhmann is working on a genre of theory that is highly differentiated he surprisingly states that, as society consists of *communications*, not of *persons*, the *world-society*⁴⁴ is already a reality — the interconnectedness in several differentiated social systems on several levels (*world religions, world economy, world science, human rights, documenta*, etc.).

From neo-kynic Punk-Theory towards
a Theory of Humanly Generated Space —

Peter Sloterdijk⁴⁵

(*LEGO: Spherology / Paradox Space-Sharing / Theory of
Humanly Generated Space/ Bubbles—Intimate Sphere—
Microsphere / Globes—Macrosphere / Foams—Afrosphere*)

“Spheres are the spaces where people actually live. I would like to show that human beings have, till today, been misunderstood, because the *space* where they exist has always been taken for granted, without ever being made conscious and explicit. And this *lieu* or space I call a *sphere* in order to indicate that we are never in fact naked in totality, in a physical or biological environment of some kind, but that we are ourselves space-creating beings, and that we cannot exist otherwise than in these self-animated spaces.”⁴⁶

It was a surprisingly successful *oeuvre* that made Peter Sloterdijk’s international standing in the beginning of the 80ies. The *Critique of Cynical Reason*⁴⁷ observed the historical types of an *enlightened false consciousness*: “Well-off and miserable at the same time, this consciousness no longer feels affected by any critique of ideology; its falseness is already reflexively buffered.”⁴⁸ These ambivalent figures appear within the police and the military, the state and the party, the secret police and religion, in medicine and philosophy, alike. Yet on the other side there are kynic counterparts to be spotted, who are driven by a ‘somatic anarchism’, individuals that perform public gestures in public spaces rather than giving speeches and reforming institutions.⁴⁹

Two decades and some publications later, another *opus magnum* called *Spheres* is finished in spring 2004. The three volumes are subtitled *Bubbles*, *Globes* and *Foams*. Obviously, *metaphors* play a prominent role in the systematic structure of the work. Again, for Humberto Maturana this would possibly be a clear enough indication to suspect that in Sloterdijk’s theoretical architecture science has been abandoned for poetry as an ‘explanatory path’. But maybe this is already a misinterpretation, as the spheres do have the most serious influence on living systems according to Sloterdijk: “What we call ‘the end of the world’ is, structurally speaking, in fact the

death of a sphere. On the small scale, the culmination displays in the separation of the lovers, the empty apartment, the photograph torn to pieces. Its global appearance is indicated by the death of a culture, the burnt out village and the language expired.”⁵⁰

What is remarkable in the context of our previous *LEGO* is that Sloterdijk, too, seems to start out with a paradox. Whereas von Foerster, Spencer-Brown and Günther are interested in an epistemological approach (observed and observing systems, *observing* as *making a distinction*, *simple* and *double* reflection), and Luhmann rather concentrates on the analysis of *communication* and its *changing codes*, Sloterdijk starts with the ‘surreal’ structure of a *situation* (or the *sensation*) of *Being-in-an-intimate-Sphere*.⁵¹ He tries to reconstruct how this ‘bubble-effect’ of *two-in-one-ness* comes about in the first place. For any *space-creation*, he deduces, there have to be two poles which mutually project space onto each other. As a result, there is no space-tension without poles, “there are only *dividuals*,”⁵² we are all somehow the rest of substantial pair, an original *microsphere* and thus we are constantly looking for new supplements. But this ‘surreal structure’ is not merely conceived as a *relais* of interaction that we might operationalize in a research project with the MIT-Future Lab, looking outside and inside into the innersystemic representation and outside again to coordinate behaviour and watch the coordinations of others watching us. It is the everyday form of *living-in-something*, e.g. the subjective feeling of well-being and security and openness and longing all in one, that is an issue here. Thus a sphere is, to make a statement, closer to air than to its representation in images, words, data, and code. Yet if talking about the sphere is not possible with only formalistic or poetic training alone. A sphere is e.g. about notions of being close and feeling far away simultaneously. And Sloterdijk’s suggestion for the “structure” of a *microsphere* is, that it unfolds as a spacial paradox, in a *microsphere* *the two elements or poles can come closer to each other than one element can come to himself/ herself*, (a competence of access they allegedly share with angels and demons).

Is this now similar to e.g. the processing of *eigenvalues* as described by Heinz von Foerster for a loving couple? To a great extent, yes. But a critical difference seems to be the lack of the constructivist inclination towards epistemology. In Sloterdijk, there is but a faint echo, the aim of *Spherology* seems to be not *formalisation* but the *explicitation* of humanly generated Spaces. So that one could better care for them, I reckon.

Heinz von Foerster was, by the way, not *really* the nephew of Ludwig Wittgenstein. It is true that he knew the famous book of his Uncle, the *Tractatus Logico-Philosophicus* (1922), by heart when he was still at school. And it is true that he called him *Uncle* (and Wittgenstein might have smiled back), because their parents were good friends and one would meet regularly these days. But he is obviously not *really* his nephew, not *really* related, I found out while searching the web for this article. Quite a blow, as I liked the idea very much.

From the Macy-Conferences to pondering paradoxes of spaces-creating — this extensive LEGO-land-tour with its positions and oppositions lead us quite far and through tricky and sometimes hostile territories. Old positions and constellations are fantastic to talk about what is to come. I, the exhausted guide, am looking out now for the travelogues of your own trips,
your LEGOS — and for some salty liquorice.
“until you’re there to share your air”
(gus gus)

¹ **Weblinks for Heinz von Foerster**

<http://www.univie.ac.at/constructivism/HvF/bib.htm> (en +de):

bibliography, lots of commented links to articles For a sampler of english texts see: Foerster, H. von.: *Understanding Understanding—Essays on Cybernetics and Cognition*, Springer-Verlag Vienna / New York; 1st edition 2002, 352 pages

² <http://ei.cs.vt.edu/~history/VonNeumann.html>; he was also part of the “Manhattan-Project” for the development of the atomic bomb. His constant advice to President Nixon to consider a *preventive atomic strike* against the USSR during the Cold War is said to have inspired a cult figure of film history and the idea for the “Doomsday Machine”: *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* by Stanley Kubrick (1964); <http://trace.ntu.ac.uk/frame2/articles/borg/kahn.html>

³ A German edition of the conference protocols was not published until 2003 (1100 pages...). It claims that from our point of view of the beginning of the 21st Century the *Macy-Conferences* mark several epochmaking turning points, from *Thermodynamics* to *Cybernetics* (again Oswald Wiener, who became famous with his book *Design for a Brain*), from *Disciplinary Societies* to *Control Societies* (Gilles Deleuze, a French philosopher who was very much read in the 80s and is still influential in current theories of the Left) and from *Industrialism* to *Information-Society* (Jean-Francois Lyotard, another French intellectual who is said to have started the discourse on *Postmodernity*); Pias, Cl. (ed.), *Cybernetics-Kybernetik, The Macy-Conferences 1946–1953*, *diaphanes* Verlag, Zurich

- ⁴ Forster, Heinz von, *Cybernetics of Cybernetics or The Control of Control and the Communication of Communication*, Illinois 1974, 2nd edition 1995 by Future System, Inc., Minneapolis; A book with very rich material in terms of texts, sketches, organigrams, caricatures, calculations, photos
- ⁵ Baecker, D., *Kybernetik der zweiten Ordnung*, p.22-23; in: Foerster, Heinz von, *Wissen und Gewissen*, Frankfurt am Main, 4th Edition 1997; transl. L.F.; The term *sub-ject*, one of the most disputed terms in philosophy, stems from the lat. *sub iacere*, being (thrown) under, being at the bottom of something, L.F.
- ⁶ **Weblinks for George Spencer-Brown**
<http://www.lawsofform.org>. This is a web site inspired by the book *Laws of Form* by George Spencer-Brown. Its sole intent is to make more information available about this pioneering work, and thus to broaden knowledge and appreciation of it. <http://www.enolagaia.com/gsb.html> Biography, bibliography and material concerning the book *Laws of Form*. <http://www.robotwisdom.org>.
 Short biography and list of resources on the web
- ⁷ <http://www.lawsofform.org/ideas.html>. Experiment and text by Jeffrey James
- ⁸ <http://www.robotwisdom.com/jorn/gsb.htm>
- ¹⁰ plato.stanford.edu/entries/russell-paradox/
- ¹¹ Reese-Schäfer, W., *Luhmann zur Einführung*, Hamburg 1992, pp.75-76
- ¹² Foerster, H. von, "Laws of Form", Review on G. Spencer-Brown, *Laws of Form*, in: *Whole Earth Catalog*, Palo Alto, Cal.: Portola Institute p.14
<http://www.lawsofform.org/gsb>
- ¹⁴ Baecker, D., *Kybernetik zweite Ordnung*, in: Foerster, H. von, *Wissen und Gewissen, Versuch einer Brücke*, Frankfurt a.M., p.20
- ¹⁵ Foerster, H. von, "Thoughts and Notes on Cognition", in: *Cognition, A. Multiple View*, hg. von P.Garvin, New York: Spartan Books, pp.25-48
- ¹⁶ Foerster, H. von, *Wissen und Gewissen, Versuch einer Brücke*, Frankfurt historical and cultural contexts a.M., p.146
- ¹⁷ Commentary by the editor, the Bohmeier Verlag in Leipzig; to visit the

website is another particle in Spencer-Brown's idiosyncratic universe as next to books about formal logic one may order literature about magic, channeling, UFO's, time travels and other research in "alternative world-views", <http://www.magickpur.de/cms/index.php?isbn=3890942881>

¹⁸ Foerster, H. von "Through the Eyes of the Other", in: Frederick Steier (ed.) *Research and Reflexivity*, London: Sage Publications, pp.21-28; in German language:

<http://www.brock.uniwuppertal.de/Vademecum/index.html> provides a well-done introduction into the field with artistic and cyber-friendly means

¹⁹ <http://www.robotwisdom.com/jorn/gsb.html>

²⁰ Spencer-Brown, G., *Only Two Can Play This Game*, Cambridge 1971

²¹ <http://www.lawsofform.org/gsb/vita.html>

²² <http://www.robotwisdom.com/jorn/gsb.html>

²³ Other characteristics of George Spencer-Brown are, I think, very inviting for artistic interaction: "Recreations include shooting, tennis, cricket, soccer, chess, piloting anything that will fly, exploring, photography, maps and map-making, listening to Mozart, cooking in commercial breaks, composing and performing songs and ballads, constructing ingenious machines that actually work, and inventing astonishing games that can actually be played."

<http://www.lawsofform.org/gsb/vita.html>

²⁴ **Weblinks for Gotthard Günther**

<http://www.vordenker.de/ggphilosophy.htm> (en/de). Large collection of original texts of Gotthard Günther (about philosophical issues and problems of polycontextuality), as well as comments, and the continuing works of Rudolf Kaehr and others. guenther.uni-klu.ac.at Bibliography, biography, original texts and a short overview about the important themes of Gotthard Günther's work.

<http://www.techno.net/pkl>. Keywords, glossary, mindmap and a short introduction into polycon textural logic.

http://userpage.fu-berlin.de/~gerbrehm/GG_Seite.htm (de/en). Original texts out of Günther's inheritance, containing letters and essays about science fiction.

- ²⁵ This is not unimportant for East-Western-European *Lego* as the possibility of the congruence of a genetic and spiritual inheritance has often produced biographies with a potential for classic, dynamic or even explosive feed-back into a cultural context. It was established when Martin Luther declared celibacy a heretical additive to biblical Christian life and married a nun in 1525. On the contrary, the biographies of the children of Catholic priests begin with the stigma of a spiritually as well as socially illegitimate position. The only other cultural dispositives I know of are the sons (in the meantime and in reformed cults, daughters as well) of Jewish rabbies and the sons of Brahmins in India.
- ²⁶ Joachim, P., Gotthard Günther, The “Einstein” of Philosophy, http://www.vordenker.de/ggphilosophy/ggeinstein_en.htm;
- ²⁷ Eduard Spranger, both a philosopher and psychologist, was to become one of the most profiled German paedagogists after he left Leipzig in 1920. He also created the “Weltanschauungstypen”, a typology of theoretical, economic, religious and ambitious human beings (e.g. c.p. “homo economicus”)
- ²⁸ Joachim, P., Gotthard Günther, The “Einstein” of Philosophy, http://www.vordenker.de/ggphilosophy/ggeinstein_en.htm;
- ²⁹ Joachim, P., Gotthard Günther, The “Einstein” of Philosophy, http://www.vordenker.de/ggphilosophy/ggeinstein_en.htm;
- ³² Goldhammer, E.von, Günther 2000, A Contribution in three Parts, Part I: Cognition and Volition; http://www.vordenker.de/ggphilosophy/gg2000_1en.htm
- ³³ *ibid.*
- ³⁴ **Weblinks for Humberto Maturana**
<http://www.oikos.org>; Well-structured introduction into the basic ideas of the Theory of Living Systems
<http://www.thymos.com/mind/maturana.html>; Short review of Maturana’s most important book
- ³⁵ Maturana, H. , *What is it to know — Was heißt es zu wissen?*, Karl-Jaspers-Vorlesungen zu Fragen der Zeit, 1991, Carl-Auer-Systeme, Heidelberg, 9th Lecture, Tape 2, 11-14th minute

³⁶ <http://www.oikos.org/vincliffe.htm>

³⁷ <http://www.oikos.org/vincliffe.htm>

³⁸ Maturana, H. , *What is it to know—Was heißt es zu wissen?*, ibid. 9th Lecture, 17th minute

³⁹ That actually depends on how close you look for the metaphoric level in abstract terms, too. They can be, which Maturana is well aware of, normally quite easily be derived from every day life as well. Lets analyse 3 abstract terms in interaction: *System*, *method* and *problem*. 1. The notion *system* stems from the greek *sys*—together+*titemi*—putting s.th. So if e.g. your little sister is playing with *LEGO* and builds a little structure, you witness one possible domain of reality where the term *system* will apply as she is *putting things together*. 2. The term *method* e.g. stems from the greek *meta*—over/around+*hodos*—the way and means *the way over* s.th. or *the way around* s.th. 3. The term *problem* stems from the greek *pro*— in front/forward+*ballein*—to throw. Now lets imagine that the sister has build a mountain landscape and wants to build a railway there. A valley in her way could state a *problem*, something that is thrown before her in a troubling manner. She looks for a *met-hod*, a way around or over it. And the solution might be, that she makes a *sys-tem* of pilons from *LEGO* that will carry a bridge for the *way-over* for her locomotive. Or she lets the railway go down and up again in serpentine, a *met-hod* as well but now in the meaning of a *way around* the *pro-blem*, the valley. Thus, most abstract notions and terms can be applied to a consensual reality of interactions like your sister's playing in the garden. As another question to finish with: How might your sister feel now and in 20 years about her ancestors, her home country, her being the daughter of her mother? In what space does she *feel in*, will *grow out it*, will *feel thrown out of it* (remember e.g. Lars von Trier's Film *Festen*). Here, Sloterdijk's metaphor of the *Sphere*, which is a very old, rich and abstract in its consensual history, might apply better.

⁴⁰ Maturana, H., *What is it to know—Was heißt es zu wissen?*, ibid., 1st Lecture, Tape 2, 1st Minute

⁴¹ **Weblinks for Niklas Luhmann**

<http://www.systems-thinking.de/luhmann.html>. Collection of links and essays on Niklas Luhmann, self-organization and system-thinking.

<http://www.brock.uni-wuppertal.de/Vademecum> (de). Adaptive Hypermedia-Interface, based on system theory and aesthetics Includes an extensive audio-visual glossary for basic theoretical concepts and an effective navigation-applet.

⁴² Luhmann, Niklas, *Die Gesellschaft der Gesellschaft*, Frankfurt a. Main 1998, p.11

⁴³ *ibid*, p.10

⁴⁵ **Weblinks for Peter Sloterdijk**

<http://www.petersloterdijk.net>. Introduction / Bibliographie (de + fr)

⁴⁶ Sloterdijk, P., *Schaumdeutung, Peter Sloterdijks Neuerzählung der Geschichte der Menschheit*, Interview mit Gert Scobel, June 17th 2004, Kulturzeit, 3sat TV (Germany, Swiss, Austria)

⁴⁷ Sloterdijk, P., *Critique of Cynical Reason*, Theory and History of Literature Vol. 40, University of Minnesota Press 1987

⁴⁸ Sloterdijk, P., *Critique of Cynical Reason*, Theory and History of Literature Vol. 40, University of Minnesota Press 1987, p.5

⁴⁹ Huysen, A., The Return of Diogenes as Postmodern Intellectual; in: Sloterdijk, P., *Critique of Cynical Reason*, Theory and History of Literature Vol. 40, University of Minnesota Press 1987, p. xi-xiv

⁵⁰ Sloterdijk, P., *Sphären I — Blasen, Mikrosphärologie*, Frankfurt a. Main 1998, p. 49 (transl. L.F.)

⁵¹ cp. Esp. Sloterdijk, P., *Sphären I — Blasen, Mikrosphärologie*, Frankfurt a. Main 1998, *Einleitung: Die Alliierten oder: Die gehauchte Kommune*, engl.: *Introduction: The allies or: The animated Commune*; pp.17–83

⁵² Sloterdijk, P., *Es gibt lediglich Individuen, Singles sind multiple Persönlichkeiten, Folterbilder die Rache des Autorenfilms, und der Begriff der Gesellschaft ist tot — es lebe: der Schaum*. Ein Gespräch mit dem deutschen Philosophen Peter Sloterdijk über seine ‘Sphärentheorie’, geführt von Sven Gächter und Helmut Wachter, in: *Weltwoche* 29/2004, pp.68–71