

PATTERNS

ASCD Systems Thinking and Chaos Theory Network Newsletter

Sept/November 2002

From the Editor:

This double issue of PATTERNS is devoted to the memory of **Heinz von Foerster**, who died October 2nd in his home on Rattlesnake Hill in Pescadero, California, at the age of 90. Heinz was a man of great mind, heart and soul who will be known by future generations as a major contributor to the changing consciousness popularly known as "the paradigm shift."

In our contemporary world governed by exchange of information in pre-packaged sound bites, the passing of Heinz von Foerster at this time in our cultural evolution is especially tragic. We will need to understand and conserve his intellectual contribution with tenacity as we move toward becoming human in an increasingly hostile socio-political environment.

It is easy to be seduced by the fears of our present world problematique but ideas have been let loose in our universe that point to a resolution of our misconception that life is a struggle of the fittest; that competition is the energizing force of social organization. Heinz's perspective is important for the possibility that our design of a global society will be conducive to all healthy living systems. To many of us, both his personal and academic life stand as a beacon guiding us to the understanding of what it is to be truly human.

His son, **Thomas von Foerster**, who is the publisher of journals for the American Institute of Physics, commented that:

"Right up until his final days, he remained an intellectually questing man who took life full bore. He was always 'on'. Everything he did, he enjoyed and did as fully as he could -- from detailed mathematical investigations to ripping

The Many Manifestations of Heinz

by Frank Galuszka

I wrote the following as an introduction of Heinz Von Foerster's keynote address at a meeting of the American Society for Cybernetics at the University of Illinois in Chicago in 1995. This meeting was organized in his honor, and specifically focused on his work on circularity. At the same meeting Stafford Beer and Robert Vallee awarded a medal to Heinz on behalf of the World Organization of Systems and Cybernetics. My introduction captures my feelings about his extraordinary vitality, creativity, and fullness of being, as well as some biographical details. In 1995 I moved to California and since then, visited Heinz frequently, often painting the landscape around Rattlesnake Hill.

Heinz, as most of you know, lives with his dear wife, Mai, on Rattlesnake Hill, in Pescadero, in California, where things, to my way of seeing, occur in magic mirrors; where either the ocean is on the wrong side or the sun doesn't know where it is going in the sky, where trees are more permanent than the land on which they stand; where a seismic goose hangs from a door jamb and the sway of its head decides whether or not a tremor felt is a perception or an illusion.

As an introducer, I get to propose a Heinz to you. Usually the job of an introducer would be to propose the most familiar Heinz possible, an easily recognizable one, a shared one, such as the geographically locatable one I have just begun to describe.

But I don't want to squander this opportunity by trading in the familiar. I get to construct a Heinz, and, as I believe him, I know that the Heinz I create will be mysteriously telling him something about me, that it will say more about me than about him, and that I am welcome to look at it this way myself, and I am welcome to welcome the specter of self-consciousness into my presence as I consider this.

Knowing this, how can I propose to you some kind of standard, biographically controlled Heinz? Paul Schroeder sent me a note in the mail which contained a recollection of Heinz von Foerster presenting himself not as just one man, but as a whole collection of people.

That comment helped me to clarify my position on the role of style in the visual arts. I am not going to discuss that, except to say that the statement resonated and still resonates through me as describing a middle path between two failures to comprehend complexity: the false rigidity of self-conscious consistency and the wicked pathology of double-lives and multiple personality disorders. It is because of the endless Heinzes being generated by Heinz himself that the Heinzes that are built by others do no damage. The opposite of doing damage; all the Heinzes dance.

It is because of endless Heinzes that we can live for the moment with a ubiquity of Heinz. Like a Hindu god, he can have as



out the poison oak that grows wild on the hillside at his home."

In past issues of PATTERNS we have tried to show how an understanding of cybernetics itself is of great importance in determining the future. Heinz has been a seminal figure in the field and is known as the father of second-order cybernetics. In the July 2001 issue of PATTERNS in which we introduced this fundamental shift of consciousness through an article (or I should say language exercise) by **Lucas Pawlik**, from the University of Vienna, Heinz reminds us that since Aristotle, philosophers and physicians have been developing theories of the brain. But now, "What is new is the profound insight that it needs a brain to write a theory of the brain. From this follows that a theory of the brain that has any aspirations for completeness, has to account for the writing of this theory. And even more fascinating, the writer of this theory has to account for her/himself. Translated into the domain of cybernetic: the cybernetician, by entering his own domain, has to account for his own activity; cybernetics becomes cybernetics of cybernetics, or second-order cybernetics."

The basis of second-order cybernetics which Heinz was able to see so clearly, is circularity.....the ethical foundation of humanity. Relationship is everything. As he has said; "***I like cybernetics: Its intrinsic circularity helps me to see myself through the eyes of others.***" It is this simple, yet profound, understanding that has made him the well-loved "inventor" and guide for a growing number of people. We look around us today with the questionable politics, technological complexity and corporate greed and ask why this new perspective is important to us as human beings. Heinz asks us to consider that "*this perception represents a fundamental change not only in the way we conduct science, but also in how we perceive of teaching, of learning, of the therapeutic process, of organizational management, and so on and so forth; and --I would say-- of how we perceive relationships in our daily life. For example, consider*

many arms and many legs as we like. Like a Hindu God, Heinz can have many aspects: He is wholly present in each of them, vigorously present with acts and legends, and connections that meet across the ordinary constraints of space, time and expectation. These aspects are all busy becoming, busy fulfilling themselves by means of further propositions, wonderings, and other cognitive prana. They fulfill themselves by becoming further becoming.

Heinz has been called a guru. In my own personal opinion, among the many Heinzes that walk around in my house, there are some models that are specialists in traditional careers: Heinz the scientist, Heinz the magician, Heinz the husband. But there is also one that fits the description of a bodhisattva, plain and simple. This Heinz is not bigger than the others. He does not require an aura around his head of any particular color. He may even refuse to take to the lotus position. He is more inclined to be assistant to Mai as she works in the kitchen. But he releases a shakti-pat, which, in the world of academic science, is probably considered a criminal act.



I want to mention a handful of Heinzes that are not likely to get so much attention: several manifestations of the most solid of Heinzes, the physical Heinz, the one who only appears at a single place at any time. This is the man who chops wood, clears poison oak, who picks up handkerchiefs dropped by ladies, and runs off to get a wheelchair when one is required. This Heinz has a striking, even profound, masculinity. This is also Heinz the artist, maker of furniture and sculpture, of a remarkable place to live in, son of Lilith who was Kokoshka's Eve.

He does not know, after all, only calculations, histories, and philosophies: there are savvy surrealist periodicals, as well as tremendously hip books on Tchewlitchew and Tantric Art on his shelves. And he does not know, after all, only such thoughts as arise in books, only aesthetics and criticism: Through an ax he is a man who joins with trees on a regular basis. His thumb knows the heat that builds up in the spoon as the ink on a woodcut block is painstakingly transferred to paper. His fingers delight in writing, and in carving, out of an eraser, the Von Foerster crest -- both in original and erotic design -- for a bookplate device. When it comes to designing, he predicts not only how an angled mirror will reflect adequately the face of a man who shaves, but how this will reflect he who shaves against a landscape of surprising enchantment that reveals a communication so unusual in the context of the construction of a home that it can best be described as an architectural wink.

He is a Midas of meaning: What he touches, becomes vivid with sensibility as intentionality; and general function, always adequate, is furthermore transparent to a becoming that requires you, the observer, the companion in meaning. This, I think, in its fundamental form, is the mission of the artist. To make, of matter, companionship.



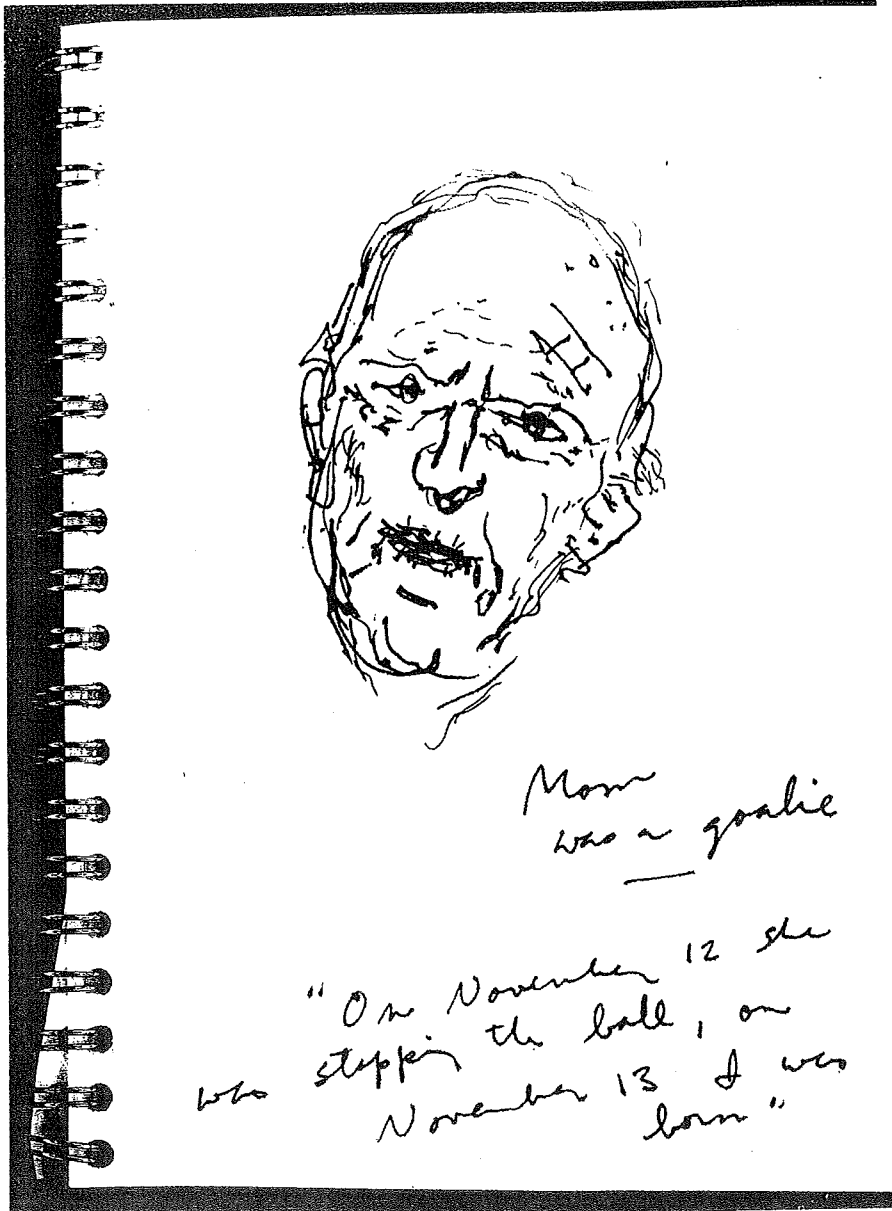
HEINZ VON FOERSTER
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This Heinz, not an anti-Midas but actually a second-order Midas, of course, knows it is not goldmaking that matters, but the goldmaking of goldmaking. For unlike Midas, whose gift ultimately destroys all companionship, Heinz generates companionship by what he touches. Unlike Midas who reduces diversity to uniformity as the world collapses into metal, Heinz coordinates diversity, so that even a piece of metal, under his touch, comes to life.

So I have, in my life around me, not just Heinz von Foerster, one man, but Heinz von Foerster, as I said earlier, a whole collection of people. This might turn out to be troubling, claustrophobic in the very least, if the rest of the world survived this proliferation of Heinzes and stayed as it was. All these Heinz's would squeeze everything else out, and I would feel oppressed, as by an overbearing guru.

But it is not only Heinz, it is everyone who, in the light of this magic, becomes a whole collection of people: A whole collection of Bobs, a whole collection of Harveys, a whole collection of Kathleens, of Judys, of Klauses, of Steves, of Jeremys, of Rodneys, Freds, and Larrys, of a whole collection of Chichos, and so on, as well as collections upon collections of coordinated newborn spaces for them to live, breathe, and generate further becomings in.

So now, with that, I am deeply delighted to introduce the one, but not the only, Heinz von Foerster.



observers watching the world go by."

Heinz' message is timely. He notes that as independent observers we can tell others how to think and act and he calls this the origin of moral codes. But if we consider ourselves to be participants in a mutually interactive circularity of human relations we can only be responsible for our own thinking and acting which he sees as the origin of ethics. Morality is imposed from the outside, ethics emerges from within. Which, he asks, would create a more viable society?

For myself, this seemingly simple insight has become the infrastructure of my life and I am deeply grateful that I have known this giant of a man. PATTERNS has been an attempt at discovering continuities--patterns that connect--and with the passage of Heinz, the legacy that he has left behind, I feel, is the clarification of the path to the future. Not a map, as he pointed out in his eloquent response to Ken Wilber's comment on boundaries (PATTERNS March 1997) but the path we lay down in the walking of it. We feel extremely fortunate to have reported on conversations with other "giants" such as Humberto Maturana, Ervin Laszlo, Ralph Abraham and others. We invite the reader to visit our website at www.haven.net/patterns/ where we have an index of past issues.

With the help of co-editor, **Frank Galuszka**, past president of the American Society for Cybernetics, we have gathered commentary from some of Heinz' many colleagues and friends.

Kevin Kreitman writes that: "Heinz and Mai have been a blessing and an inspiration to the cybernetics and systems communities and to so many of us as "human becomings" as Heinz liked to say. As one of the recipients of their legendary love and generosity, I wish to acknowledge my profound love and admiration for Heinz, not only for his towering intellect and professional work but also for his passionate engagement in making the world a better place, for his incredible humanity and love."

Ranulph Glanville comments: "Heinz was a magician. Yet I think that

A Personal Story of My Encounter With Heinz von Foerster

by Bob Zielinski

What my grand parents brought from the "old country" when they immigrated to the United States, and what they held most precious in their lives, was the value of education. As a child, I resonated with this concept, and was taught to do the best I could in school so that I could learn to "reason" and thereby make the best of my life and contribute back to society, so that people would then have better lives.

So after years at the University of Illinois in classical courses of mathematical theory and Quantum Mechanics little did I realize that the man whom I would eventually hold as my greatest mentor would be so "unreasonable". What could be more unreasonable than a man who was invited to be the featured speaker at a world conference on "Alternative Futures", speak on "alternative pasts". The very concept made me dizzy because I knew for sure that there was only "one" past. What could be more obvious? But in the moments as the story unfolded and Heinz spoke of "perception" and alternative ways of seeing and "creating" our reality, a great melting happened within me and continues to this day. I learned the great lesson that reality is not "fixed" and the importance of staying mentally flexible and to search for solutions in unexpected places.

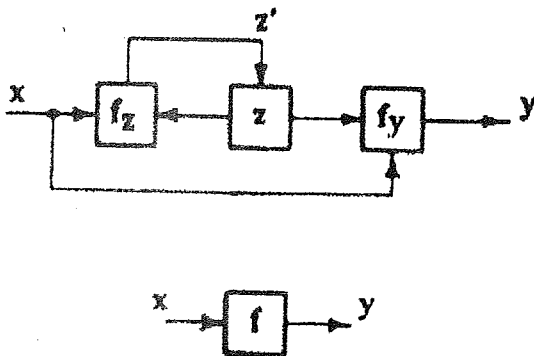
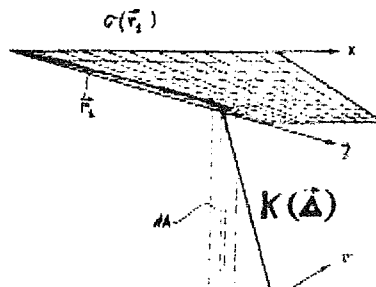
In the years of classes with Heinz that followed, I saw him as the ultimate scientist, enthusiastically popping into and out of equations of entropy and information theory, always pointing to the larger, or "meta" picture of the whole system. While components had to interface properly to make the whole system achieve it's "teleological goal", Heinz always made sure that we remembered that we as the investigators were an integral part of the investigation itself. The classes were always a dynamic interaction of the participants and their cooperation was the acknowledged key Cybernetic ingredient of the learning and creation process. And we were playing with big systems - how to enhance and facilitate world communications given different languages, geographical proximity, and the powers of the emerging computer hardware and software.

Heinz showed us how, when we looked at the whole system, often the problems we studied were really solutions, and that the apparent solutions were often the problem. But most of all, what I learned, is

how the important solutions that could benefit the world rested on simple and obvious observations, and these were often the most elusive. We saw in class how people can work together in cooperation and that when each individual is respected and cared for, that the whole system will work with maximum efficiency - demonstrated "synergy". What a contrast to the "entropy" of the world.

Heinz stretched my mind beyond thinking, into the realm of encompassing the totality of the system, and looking into the center to see what really makes it tick.

I will always feel my deepest gratitude for what I have experienced through Heinz and the insight into Wisdom I have gained.



Invitation to Dance – a Conversation with Heinz von Foerster

by Christina Waters, PhD

Meeting with Heinz von Foerster last month at his home nestled in the Santa Cruz Mountains, it was my hope that he discuss some of the premises that have underwritten not just his professional life as a cybernetician, but his personal life extending from youth in Vienna to a variety of entrepreneurial adventures in this country. Seated with the 88-year-old physicist — his frail body somehow persistent, eyes flashing with intellectual vigor — what emerged was a clear commitment to a set of guiding principles. Famed as a robust raconteur, von Foerster explicated his dedication to the path that has led him, with characteristic dignity, to these penultimate days he enjoys at Rattlesnake Hill in coastal California. November 1999, Santa Cruz, California

Q. Do you think that in the end, from where you are right now, that you've been an inventor or a discoverer?

A. Always an inventor. A discovery means, you see, this is to uncover, to take a blanket away. Discover means you undo a cover from a thing which is already there. Take a cover off. The inventor is doing something which is new, which is not already there.

And my position is, we create all the time, when we're sitting down and talking with each other. It's always something absolutely new, which was never there before.

The discoverer position, which people are very fond to maintain, is in a sense being not responsible for that which you are talking about. Because if you are only taking a cover away from something which is already there, then you are only telling how it is. With this, you avoid all the responsibility.

This was brought home to me at a class I had at Stanford University Journalism School. There was a banner that said "Tell it Like It is" — so I walk into that class and tell them, "my God gentlemen, do you want to get rid of the responsibility of being a writer by telling it like it is?" Nobody knows how it is. It is how you tell it.

That is very important. Because now you see you create the reality which all the people take as it is.

It is as you tell it. This point is so important yet most people don't recognize it.

*Nobody knows how it is.
It is how you tell it.*

Q. Do you feel that you've helped to create reality by doing the cybernetics you've engaged in?

A. I have no idea whether I have. I'm just saying what I hope somebody will listen to.

Q. Who is doing the real inventing today?

A. Everybody is, only they want not to recognize that. Everybody who opens his mouth says something, invents something that has never been said before — because we are not machines. You say a new thing, even if it's simply a question that is clumsy, or as silly or as funny as you wish. There are no stupid questions — there are only stupid answers. Ja?

Q. Why do we not want to accept responsibility?

A. Because the most horrible thing is to be responsible for something. We have invented every trick to avoid responsibility. One way is to invent a hierarchy if you're an institutional organization. In a hierarchy everybody can say, 'I didn't want to do it, I was told

Heinz was a magician. Yet I think that it was not so much the magic that interested him as the wonder. In my opinion, if there is one word to sum up Heinz, it is that: Wonder. Not wonder in the sense of confusion, but wonder in the sense of amazement. It's the wonder that makes the magic work. And it's the wonder that Heinz gave us all, all his life."

Robert Martin writes: "Like so many, I will miss Heinz. Heinz's influence will continue in me, as it has over these past thirty five years. Though we talked on the phone infrequently and saw one another even less frequently, hardly a week has gone by in those three and a half decades that the influence of Heinz has not affected my living, teaching, and thinking. The influence of Heinz's thought and his humanity—his concern and caring for others, his joy in being in the world, his stories, the way in which he embodied ideas—all these have been an influence for so many of us."

Elizabeth Russell writes: "I don't feel qualified to write anything about Heinz. I met him only through PATTERNS and wondered where he had been all my life. I met Humberto Maturana in Baltimore about twenty years ago and had the same wondering then. I feel privileged to have lived in the same generation as these men."

Alan Stewart and I visited him shortly after his return from Vienna where he was honored by the city of Vienna with the first **Viktor Frankl Award** and an archive of Heinz' more than 200 articles and papers was established in a historical city building. Alan writes; "When we conversed about his achievements Heinz was quick to give credit to others. Yet he was also happy to acknowledge that his contributions are widely appreciated. He expressed delight in my declaration that his work is greatly valued in Australia. Sparkling and solicitous, Heinz at aged 90 was truly living according to the precepts he had invented. The three of us had such a good half hour together."

For myself (and others have said this also) Heinz' most endearing qual-

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ity was his ability to make "the other" feel every bit as important as himself. Women, particularly, felt their own beauty in his presence. **Pat Carr**, writes:

"I knew Heinz during his years in Pescadero, where I have lived for twenty years. I was his neighbor for twelve of those years, and I often walked with him and Mai all over Rattlesnake Hill and the adjoining ranch where I lived. He loved Pescadero and was dearly loved in return. When he walked into Duarte's, (a famous local restaurant) he was greeted on all sides by the waitresses, cooks, other diners, and the Duarte family. He took an interest in everyone he came in contact with: a storekeeper, a mechanic, a yard worker, a chimney sweep. At the same time, he and Mai were entertaining friends and colleagues from all over the world—Vienna, Paris, New York, South America, and many other places—who came to visit him here in Pescadero. Everyone counted. And perhaps this was key to his talent for bringing worlds together.

"For me, Heinz was a rare combination of intellect and heart. We often find one or the other in people, but Heinz had an abundance of both, and I believe the one informed the other. The stories people have told today of his magic feats remind me that I often thought of Heinz as an entertainer in the highest sense of the word. Heinz always liked to look up the etymologies of words, and one day, I took a page from his book and looked up "entertain," which comes from two words meaning to hold together or between. Heinz was an entertainer in that sense: he was able to bring one world to another and hold it all together, a magic trick indeed."

Donna Jones sends us these excerpts from the obituary in **The London Times of 10/25** which notes that *"Heinz von Foerster (originally Förster) was born in Vienna, the eldest son of Emil von Förster and his wife Lilith, and educated in philosophy and logic by the Vienna Circle, and in physics at Vienna's Technical*

to do it.' That gets rid of responsibility. Or there are the famous statements from politicians – "I had no choice.;" And the moment somebody says that, they are really saying 'I refuse the responsibility for what I'm doing.' They always have all the choices, Ja?

Q. So it's hard to accept responsibility.

A. Yes — that's why we invent things like hierarchy — and objectivity. Objectivity is one of the great tricks to get rid of responsibility. You know what objectivity is all about — it says that the properties of the observer shall not enter a description of his observation. Now if that's so, what remains? No description, no observation. Because these are all properties of the observer.

Q. Don't you think that language, however, traps us into a subject-object orientation?

A. Oh yes, it does that all the time.

Q. How then can we make sense, speak meaningfully to each other, and yet still avoid reference to objectivity? Don't we almost have to reinvent language?

A. No. We can use language as a dance. Language for me is an invitation to dance. When we are dancing we are using language to suggest to each other what steps we would like to do.

Two partners are dancing out on a big floor — and nobody leads. Both lead. Both help the other to make the swing to the right, to the left, etc. These steps are not prescribed. Steps are only there as a reference to be able to use them. When we do a waltz we know how to do a waltz, but whether we do it to the left or the right, forward, backward, is a choice of the couple. And not the choice of he or she.

So when we are talking with each other, we are in dialogue and invent what we both wish the other would invent with me. Togetherness is the point in a dialogue. And language is an invitation to dialogue and not an invitation to monologue.

Q. How can someone in the everyday world see this most easily, this dance metaphor? In poetry?

Language for me is an invitation to dance.

A. I think it is played out in every way that anybody talks to each other. If I buy a ticket for the movie, I have a conversation with the lady behind the window. And I smile, and she smiles back. And we have become friends for two seconds. And we have contacted another human being. And this is probably what makes some people a little bit queasy about me. This is my personal fun which I have in life, to contact other people in such a way that the other is taking notice of me. You know my funny statement — the hearer and not the speaker determines the meaning of an utterance. And if you know that, then you need to determine how you must speak so that the hearer is dancing with you.

Q. So it makes sense that someone who is a performer — you — would use some of that body language to help that dance take place.

A. Yes. But I don't play the tricks. What I do is, I aim that way. If I step up to the ticket counter, I know I'm speaking to a human being.

[He conveys an incident in which he was trying on shoes and he sensed immediately that something was wrong with the salesperson.] I said, 'what is wrong?' She said she had destroyed her car today, and she began crying. And you see, this is what happens. I aim at the human being.

[He relates another story about a huge international conference in Hamburg in one of the largest conference centers in the world.]

So I came to this huge psychiatric conference with all the most important, great professors of the field. I was there 2 minutes before starting time. I went to a room where I could get a cup of coffee. And here were these giants of social psychiatry, and I started introducing myself and then began to look for the coffee. It was on a far table and next to it was a big leather couch. There was a woman sitting on the couch who was clearly in distress. I went over to her and asked if I can help her. No, I have an extraordinary miserable earache, she tells me. I can't even think, I can't even see. I offer her my Tylenol. I call someone over to ask whether there's a doctor who can help, and ask if he

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can take the lady to the doctor. As she went out to see the doctor she thanked me.

I thought this was interesting. You need a physicist from California for the international conference of social psychiatrists to find out that the wife of one has ear aches and can't think. The point is, it was so obvious to me. In a tenth of a second, I could see this. And here the great professors could not even tell that one of them was in distress.

Q. You have very strong diagnostic skills.

A. No I'm just feeling my way around. I always ask, Who is the other? I always think about the other. The other is the one who interprets my experience.

Q. Yes, and that I think is why you tell stories. You tell a great many stories — but it's never just to talk about yourself. You are engaging your listener. You have always told stories have you not?

A. Yes — of course. Our family was a story-telling family. My grandmother was telling stories, my uncle was telling stories, we were all always telling stories. Perhaps it's a Viennese habit — it could be a cultural hang-up. [He laughs.]

*You have to dance with somebody else
to recognize who you are.*

Q. It could explain why conversation became so important to you.

[Heinz tells a story of his father and uncle being captured during world war I just after the war began.] My uncle was in Siberia, my father was in Serbia. One of my uncle's co—prisoners escaped, my uncle told him to contact my mother and tell her that he was still alive. So he left. Six months later, he had walked from Siberia and popped up in Vienna. Which was possible in the year 1916, because it was before the collapse of the Russian Empire. So he came to my grandmother and said I have a letter from your son Ervin in Siberia. She invited him in for a coffee and asked how he had made it, how he had succeeded in walking for six months from Siberia to Vienna. And he says, yes it was tough. And that was the story. That was an example in our family of good story telling.

Very quick and to the point. [He laughs.]

Q. Why didn't cybernetics become a mainstream endeavor? Why don't people all over the United States know what cybernetics is?

A. But look! It is. Cybernetics is in every second word. If you open the newspaper there is cyber space, cyber sex, cyber this and cyber that. Everything is cyberized.

Q. That's not cybernetics, [we're both laughing]

A. No, but "cyber" is there. Look at terms like "feedback." Everybody knows what feedback is. Cybernetics did that. Things of that sort. I think cybernetics connects underneath. It's implicit. Underneath, it's completely alive. But not explicit. In some cases I find it more important that something is acting implicitly, than explicitly. Because the implicit has much more power.

Q. So you think that in a way it has infiltrated the intellectual mainstream?

A. Absolutely!. Nobody can talk without at least the presence of cybernetics being operational. The presence of these notions is absolutely alive, only not explicitly referred to. I find it very powerful that it's underground. Because people are unaware of it — and therefore don't reject it.

[We laugh.]

Q. It's gone underground and we in fact use it whether we know it or not.

A. Ja, exactly.

Q. Who is furthering cybernetics today?

A. All the internet people, all computer people today. They are all cyberneticians whether they like it or not.

Q. In what sense, Heinz?

A. Because they initiate dialogues. Internet dialogues are initiated and then they expand over and over. You expand the network's interaction.

Q. So initiating conversations is critical. Why are conversations so important?

University. He completed his doctorate at the University of Breslau in 1944. His family was distinguished and held a prominent position in the intellectual life of Vienna: friends and relatives included the philosopher Ludwig Wittgenstein, the playwright Hugo von Hoffmansthal, the painter Erwin Lang, and the Wiesenthal family.

The family supported Josef Matthias Hauer, the inventor of an alternative to Schoenberg's 12-tone technique. His grandfather was architect of the Vienna Ring. He had a brother, Ulrich, and a sister, Erika, and was especially close to his cousin Martin Lang, with whom he studied magic and roamed Austria's mountains in winter and in summer."

Heinz' story-telling ability has left indelible pictures in our minds of a bright, fun-loving, inventive boy who gave his early teachers a lot of trouble. His love of the natural beauty of the mountains is felt as he tells of his adventures with Martin Lang, learning the magician's art.

Ernst von Glasersfeld writes that "when Heinz becomes interested in something, he becomes a professional. In his teens, like many of us, he and his cousin Martin became intrigued by the tricks of magicians. But they knuckled down and studied the craft and eventually graduated with an official diploma in the art of magic. Every now and then they wanted to go to the mountains. They lived in Vienna, and to go and spend a few days in the Alps cost money. They often did not have enough so they saved a bit to buy the train tickets to where they wanted to go. Then they climbed up to one of the refuge huts of the Alpine Club and announced that they were magicians and would give a performance in the evening. And because they were very good, they made enough to pay for a couple of days' stay. It was an inspired way to get around a constraint that kept most other mountain-loving youths in the city. So much for what I would call dealing with sensorimotor constraints.

You may not have noticed it, but Heinz frequently practices what he learned about the magician's psychology. When a conference threatens to turn nasty, he pulls a remark out of his sleeve and, suddenly the animosity subsides."

Heinz' grandmother, Marie Lang, was one of the first women in Europe to fight for women's rights. His mother was highly talented at drawing and painting and attended an art academy in Vienna with Oskar Kokoschka. Both of them held a type of salon in their homes where once a week artists, singers, journalists, and philosophers from all over the world came together. When his father was taken prisoner at the outset of the first World War, Heinz was taken to his grandmother's often while his mother worked in the theater with his aunt, Grete Wiesenthal, a famous dancer. He liked to say that he actually grew up in a matriarchy, sitting under the grand piano with his toys while listening to the adult conversation above him or watching the beautiful ladies in their dressing rooms in the theater.

In 1939 Heinz married the famous actress **Mai Stürmer**, with whom he had three sons. Mai and Heinz had a long and loving life together demonstrating the great art of being true to oneself in a close relationship. (See *PAT-TERNS* May 2000, p.4, where Mai, in a letter to **Paul Trachtman**, editor of the *Smithsonian Magazine*, writes how the theater is the ideal manifestation of circular communication among humans, a truly cybernetic manifestation.)

The Times writes; "During the war von Foerster lived and worked in Berlin, where he moved to disguise the Jewish element in his ancestry, and did research in short-wave and plasma physics." His instinct for survival seems based on the knowledge that in difficult times it is often safer in the belly of the beast.

The Times continues; "At the end of the war he found a way back to Austria, where he worked in the telephone industry while also reporting on art and science for the Austro-American radio station *Rot-Weiß-Rot*, his communication skills and showmanship flourish-

A. It's the humanness which is expressed in the conversation that is so important.

Q. And so conversations multiply the ways in which humanness is expressed?

A. Exactly – and so you find your own. Because in the reflection, in the eyes of the other, your own humanity begins to develop. Which you cannot do in a monologue. You have to dance with somebody else to recognize who you are.

Q. So you are a humanist?

A. I don't know that I'm a humanist – I'm entertaining myself. I enjoy myself – dancing together with somebody else.

Q. Has this been a goal in your life, this dancing with somebody else?

A. I don't know – that, I have to leave to my observers.

The wonderful thing is that it crept by itself into the underground – because of its interesting usefulness. Look for instance how an understanding of systems, like teamwork, is used in corporations, teamwork in building a motor car – having teams who make the whole car. Twenty people build a car and they cooperate with each other and they feel very creative and not this passive trivial, mechanical labor.

They can go home at the end of the day and say, "We built twenty cars. We did it."

Q. And this is the implicit conversation at work?

A. Absolutely – what they do is converse. Everybody gives the other something – to hold, or to put together. So it is a cooperative dance.

Q. Would that apply to making a movie? Or fighting a war?

A. Of course.

Q. Has your life itself evolved utilizing feedback? Have you learned, recursively, from the various conversations and, even mistakes that you made?

A. [He nods his head vigorously] Without them there wouldn't be any life at all. The whole thing is based on interaction. A living organism interacts with the universe – with every other thing. They are constantly rolling along and changing each other. And this is how life can function, because life is indeed a non-trivial system, Ja? Any action changes itself and changes all the rest.

*We always have the freedom
to decide what we want to
become.*

There are two fundamental positions which one can take when talking about anything. The one is the position that I can say, I'm sitting here and looking at the world as through a peephole at what's going on in this universe.

The other position is, I'm a part of the world. I am a member of it, not separated from the world. And whatever I do I change not only myself, I change the world as well. But as far as looking back at my own life, funnily enough, I'm not reflecting about my life. I'm doing it.

Q. Is self-reflection something you've never done?

A. I'm always surprised that I've never done that. I don't reflect about my life. I can tell you lots of lovely stories about my life, but that is not reflecting about my life. It's probably a cultural affair. We in my family, and the climate in Vienna – it was a storytelling climate. I just don't reflect upon myself. I don't even reflect about whether I reflect or not. It's not my habit.

Q. Would you say that to be within the dance is better?

A. I'd say that it's a good thing. I would never say that anything's better. Better for whom? No, I don't see universal values – I don't like to play that game. Lots of people like to – I don't. I avoid universal judgments. I'd like to undermine them as much as possible, wherever I hear them. I was always like that. Yes, as a boy. I was always the worst student in class. I always understand that it's me who sees something a certain way. And that it's me who has a responsibility for saying that. I do not want to drop it and shift to other people. I want to say my thing and it is my thing. But I would not make judgments for others. The point is – and this is a distinction I love to make – in morals you always tell the other how he has to act – "Thou shalt not." It's always told by

someone who's outside the moral arena, telling someone else how to behave. But ethics is when you say, "I shall" or "I shall not," when you make a decision how you want to be. We always have the freedom to decide what we want to become.

We are all free – we are damned to be free, as Ortega y Gasset said. I always thought this existential insight was great. Other people might think it's horrifying to be free. They would like to be told what to do.

I had several fascinating experiences as a child along with my cousin Martin — we were always playing together. We both became very interested in magic. And we got a gift package bought in one of those fun stores with lots of wonderful magic tricks for children. So we opened it and wanted to perform these things, and found that they were utterly silly. They had nothing to do with magic — it was just stupidity. So we thought – let's do some real magic.

We were about 13 or 14 – we observed that magic is exactly the same thing – the hearer, in this case the audience, - interprets or makes the meaning of what is being shown or talked about. So we have to think about what the others are experiencing when we do magic. The question is: How do you tell a story so that it transforms? First to see an elephant on the stage and then suddenly it's gone. Of course it's not gone – they just don't see it. How do you persuade them that they don't see the elephant which is on the stage? That is the problem for the magician. [He grins.]

***Magic can't be explained –
it can just be done.***

What it is of course is pure magic. You can't explain it – but you do it. Magic can't be explained – it can just be done. And much of my thinking comes from this period. Then later on slipping into the Vienna Circle of philosophers, particularly with the work of Ludwig Wittgenstein whose Tractatus I knew by heart. He would even talk to his family in terms of specific propositions in this work. But fortunately a nephew of Ludwig Wittgenstein was also enamored of this work and we would test each other about the propositions. So we knew Uncle Ludwig very well.

This influences me very much – magic, Uncle Ludwig, and of course the idealistic school of philosophy, Schopenhauer, Kant, to some extent Nietzsche. The *a priori*, what is that except a trick to avoid responsibility. He admits that he's still influenced by Wittgenstein and the rejection of *a priori* knowledge. You cannot explain anything, you can only invite to dance. You don't reflect, you just do it.

Q. Is that why you have never written a book?

A. I don't have the breath for writing a book – I can write short stories, or little articles, this idea or that idea is illuminated by me, but I don't have the gigantic, taking a big breath and exhaling five hundred pages. I can exhale about 20.

Two difficulties which stop me from writing a book – the one was the first motto which Wittgenstein uses in his Tractatus. "Everything which you understand you can say in three words." And the last words of the Tractatus: "Of which you cannot speak, you must pass over in silence."

Q. What do you think of people who do write books? Who go on and on and on?

A. They have never read Wittgenstein. [He laughs.] They are not ashamed to write a sentence which is four words long.

Q. You've said, act so as to always increase choice. You've also said that the purpose of the brain is to compute a stable reality.

A. Yes, It is the function of the brain. The brain keeps us from exploding – actually I should have long ago exploded.

Q. How do those two statements work together?

A. The one is choice – the other is about reality. They don't conflict. I have many choices of things even within just this discussion. And every question you ask me is an invitation to increase my number of choices, because I could tell you this, or that, etc. etc. And what you do in your interview, is keeping me alive, to maintain the free choice of many other branches of the stories I'm going to tell you. While we are sitting here

(continued in next column)

and I'm telling you this story, this reality is absolutely stable because you invited me to give you the story and here comes the stories. ***The point is to consider what kind of a cognitive network there must be in order that this stability which we experience is maintained.***

That is the interesting question.

Christina Waters PhD, teaches existentialism in the philosophy Department of the University of California, Santa Cruz. This interview was first published in Cybernetics and Human Knowing. Christina Waters is interested in constructed fictions and narratives and presented her paper "Seeing as: Imagination in Everyday Life" at the 2002 conference of the American Society for Cybernetics.

Editor's Note:

A recently published book titled, Heinz von Foerster: Conversations on Epistemology and Ethics by German journalist, Bernhard Poerksen (International Federation for Systems Research Series on Systems Science and Engineering Volume 17) has, in the English translation, the erroneous subtitle, Understanding Systems. According to Heinz, the true title should be, Truth is the Invention of a Liar.

Heinz describes his pleasure in his relationship with Poerksen who was able to turn an interview into a conversation. "It resulted from the fact that the interviewer chose not to vest me with authority but instead decided to test out my attitude. Rather than writing down what I said, he questioned it. Fantastic!"

This is a gem of a book from Kluwer Academic/Plenum Publishers. New York, Boston, Dordrecht, London, Moscow.

"I think confusion allows new choices to be revealed and that an ethical principle is manifested. Freedom emerges. I once said, "Act always as to increase the number of choices." That is my ethical imperative, although once again one might have the impression that I am trying to order people around, and this is just not right. I didn't choose my words very carefully when I said that. It would have been better if I had written, "Heinz, act always as to increase the number of choices." (p. 37)

ing.

Meanwhile, he was working on his book *Memory: A Quantum Physical Examination*. To promote this, he moved to the United States in 1949, where (with barely a word of English) he was taken up by the mathematician, neuroscientist and philosopher **Warren McCulloch**, with whom he communicated in the language of mathematics.

The trip was a turning-point. McCulloch was then chairing the famous interdisciplinary **Macy Conferences on "Circular Causal and Feedback Mechanisms in Biological and Social Systems"** in New York, which were attended by the anthropologists **Margaret Mead** and **Gregory Bateson**, the computation theorist **John vonNeumann** and the mathematician **Norbert Wiener** among other leading thinkers in their field.

To improve his English, von Foerster was made secretary and editor. His first act was to add "Cybernetics" to the conference title. Together with Wiener's book *Cybernetics (1948)*, these conferences gave form and substance to the emerging discipline.

McCulloch arranged for von Foerster to become director of the **University of Illinois tube laboratory**. Von Foerster imported his family and lived in Champaign until his retirement in 1976, when he moved into a house that he built himself, with his architect son **Andreas**, above the Pacific outside **Pescadero, California**.

In 1958 Heinz founded the **Biological Computer Laboratory**, attracting considerable funding and most of the distinguished scholars in cybernetics for residencies. The laboratory became the world's most advanced center for the development of cybernetic thinking. The first parallel computers were built there, and crucial research was carried out on the fast electronic switching that is critical to today's computers.

Paul Schroeder tells us a story from the Cybernetics class. "There was a controversy with the Dean of Engineering or the head of the electrical engineering department. It may have been the time the print shop objected to con-

Heinz von Foerster's Position

by *Monika Broecker*

In Heinz's work there is always a point of contact with ethics. He implicitly takes himself into consideration as part of the world. The following excerpts from our conversations illustrate Heinz's position. - Monika Broecker

Ethics:

HVF: It is for me of decided importance to separate ethics and morality once and for all. Morality is characterized by two points, the first being that every statement, every rule, every law of morality is directed to the Other. The Ten Commandments present a good example: "Thou shalt not kill", "Thou shalt not covet thy neighbor's wife", etcetera. The second point is that the authorities who postulate these laws, are themselves not subject to them. The independence of the lawmakers from their laws, originates from the attempt to enforce obedience through threats of punishment.

When you read the tons of literature that have been written in the last decades about ethics you will soon be agreeing with Wittgenstein: "It is clear that ethics cannot be articulated." Ethics must be implicit; as if one read between the lines, but not in the lines. Perhaps the best analogy to the problem of speaking about ethics appears in Chinese philosophy, where they have the difficulty of speaking about the Tao.

It is clear that ethics cannot be articulated.

Metaphysics:

HVF: Without noticing it, we constantly decide questions that are in principle undecidable. That is why people always get into each other's hair; because each person claims "I am right". Very few people see that there exists a freedom when one gives an answer to in-principle unanswerable, undecidable questions; that you make a decision when you decide either so, so, so or so.

Many people do not realize that they have made a decision. Therefore they think that they possess the true truth. They have not noticed that there was a freedom in deciding the game that they want to play from now on. I call this domain, where one does not know as yet: "Should I accept this or that as my position?", metaphysics.

I call that person a metaphysician, who consciously says: "I know that I have a decision before me. I decide."

For example: "I am an observer, who looks at the world through a peephole, and reports what he sees there" Or I say: "I don't possess a peephole. I am a part of the world. Whatever I do, I do to the world, and whatever the world does, it does to me." To decide who is right is total nonsense. One could, of course, play a game: Design experiments, that shall decide, whether it is the peephole man or the fellow man, the one who plays along or the one who takes part, who is right. I, however, maintain that the answer to this question is already contained in the experiment.

Therefore I maintain: Experiments that are supposed to decide independently of this decision do not exist. Without knowing it, we are all metaphysicians. I point out to my friends that when they, unknowingly, make decisions about in-principle undecidable questions, they become metaphysicians, whether they want to or not.

Togetherness and Circularity:

HVF: Again and again, Martin Buber drew our attention to the fact that I actually only come about, originate, in the "you". The moment I say "you", I become "I". I become aware of myself through the existence of the other. Being together, togetherness, is what makes for the human condition. Only through reciprocity, through being with one another, being two together (German: Zu-zweien-Sein), as Buber always calls it, am I actually born.

Whenever we speak about something that has to do with ethics, the other is involved. If I live alone in the jungle or in the desert, the ethical problem does not exist. It only comes to exist through our being together. Only our togetherness, our being together

gives rise to the question: "How do I behave with the other, so that we can really always be one?"

It is like a round dance, where some dancers reach out to one another and dance around in a circle. You can name these dancers: One of them is Cybernetics, another is Ethics, another is Cognition, another I, another You, or anyone. These are mutually-created perspectives, that mutually support each other. By contemplating, thinking, feeling, we find a leading thread in this incredibly fascinating, almost impenetrable world. Certain positions or views are then called cybernetics. In my opinion that fits very well, because my feeling with regard to these phenomena always gives rise to the circularity that serves as the basis for cybernetics.

As soon as I speak of "you", that you, as well, speaks of "you" about me. Then I am the other's "you". These contemplations always entail circularity.

*I become aware of myself
through the existence of the other.*

The Logic of Change:

Change essentially consists of descriptions of states. One description of a state and a second description of a state are different; and it is that difference that I regard as change. That is to say, change does not reside where one thinks it does, but it is where one describes it.

Change is a problem of description. The arch problematic of change is that one says: "X is no longer the same". From a logical point of view, that is totally crazy. Why is X no longer X? After all, one really wants to say: "Suddenly X is different." So the question is: Did X change or did my description of X change?

It is my recommendation, that the point of view that it is a matter of description, be accepted. Because if I don't accept the position of description, but the position, that change has taken place with X, I come upon contradictions and paradoxes, because I cannot claim that X is no longer X. Change manifests itself in the description. The question, whether or not X is now different, no longer comes up. Chuang Tzu had a beautiful proverb: "The essence of change is constancy."

Change manifests itself in the description.

The following is excerpted from a conversation between Monika Broecker and Heinz von Foerster:

MB You say "When I change, the universe changes as well, because I am a part of the universe" Systemic thinking assumes an interdependence of individual and all other processes of change. How are processes of change connected in the universe? How are individual, social and overall ecological or, as I think Bateson says, overall systemic processes of change related to one another? How must I imagine this process to be? What is this- as Bateson says- "*mental force*" or "*pattern that connects*"? Why do my actions have repercussions on everything else? Why is it that there is an effect on the cosmos when I move?

HVF Now, please describe to me the cosmos before and after you have moved. The so-called effects on everything else again occur in the descriptions. This question only makes sense if you separate yourself from the cosmos. When you are one with the cosmos, then this oneness is a different one, in which parts of the oneness change.

MB On the basis of what findings, insights, or philosophies do you say: "We are all connected to one another"? Is it cybernetics or systems theory that leads you to it? Is this why you can say: "I say that because I am a constructivist"?

HVF No, no, no! That is a fundamental position. It is in the beginning that these decisions stand. I'd like to see myself as separate - this idea of a peephole- or "I would like to see myself as a part of the universe".

MB But are there any stated views in systems theory or in cybernetics that could substantiate the statement: "I am a part of the universe"?

tent they were being asked to print for the class. The sense of the group, or at least my own feeling, was in favor of direct confrontation.

"Heinz was arguing for some sort of strategic avoidance. The illustration he used for argument was this: 'If I am walking and come to an intersection and the light in front of me is red, then I simply turn and go in the direction that is green.'

"This red-light green-light strategy gave me a new option that is sometimes against my nature and difficult to know when to put to use. These days I also can fit it in as an example of the non-standard geometries of social space, and also as an efficient means to traverse unpredictable networks."

Although Heinz is known in some circles for his excursion into demographics (see the contribution by **Stuart Umpleby** on page 13), he was most important for sponsoring radical work in such subjects as the organisation of the living and the foundations of mathematics and logic. He tended to hide his own contribution behind the work of others, but his understanding of the reflexive nature of systems led to profound changes in the understanding of knowledge and of our connection with the world in which we find ourselves. For many he reintroduced the amazement of wonder

Heinz held Guggenheim fellowships in 1956-57 and 1963-64, and won many honours. He was president of the Wenner-Gren Foundation for Anthropological Research, 1963-65, and of the Society for General Systems Research, 1976-77. He was elected to a fellowship of the American Association for the Advancement of Science in 1980, and in 1996 the University of Vienna made him an honorary professor. Last year he won the first Viktor Frankl Prize as well as the Ehrening award from the city of Vienna. He published some 200 scientific papers and several books, and gave more than a thousand lectures around the world.

In an attempt to give a picture of Heinz--the diversity of the man and the diversity of the work he has contributed--we have brought together ar-

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ticles and interviews. **Frank Galuszka's** introduction emphasises the many Heinzes we have known. **Christina Water's** and **Monika Broecker's** interviews demonstrate not only the quality of his personality but the quality of his thinking and work. **Stuart Umpleby** describes the role that the Biological Computer Laboratory played in the development of science along with Heinz' foray into the field of population studies. **Bob Zielinski** gives us his experience as one of Heinz' students.

And let us not forget his

In a conversation with **Yveline Rey, family systems therapist at the Centre d'Etudes et de Recherches sur l'Approche Systemique, October, 1990**, Heinz invents a therapeutic imperative: "If you want to be yourself, change!" He asks, "Is this paradoxical? Of course! What else would you expect from change?"

Yveline responds by asking; "How can you connect change with paradox?"

Heinz: Easily! You remember Paradox? It yields one meaning when apprehended one way, and one meaning when apprehended the other. What do you do when I say "I am a liar," do you believe me? If you do, then I must have spoken the truth; but if I had spoken the truth, I must have lied, etc., etc.

What is the problem here? Lying? No, the problem is "I," the shortest self-referential loop. When speaking about oneself, using "I," magic is performed. One creates oneself by creating oneself. "I" is the operator who is the result of the operation.

Yveline: This is all magic to me. Where does "change" come in?

H: The paradoxical nature of change is much richer than the orthodox "paradox of the liar" which switches from "true" to "false," and from "false" to "true," and so on and so forth in dynamic stability. The unorthodox nature of change arises when you apprehend "change" any way you wish to apprehend it, and it will yield something else, otherwise it wouldn't be "change." This is, I believe, its

HVF I would rather say it the other way around: Certain statements of systems theory come up from this position, as for example Bateson's mantra "the pattern which connects" with Heinz von Foerster's footnote "the matrix which embeds". All of these connective ideas emanate from a fundamental position, which this thinker has accepted for himself, perhaps without explicitly having expressed it thus in many instances. It is a basic position, which then invites him to express these pronouncements, these propositions, these views. I would say that these thoughts, these statements are consequences of a position, which many of these thinkers have adopted, without making it clear to themselves, that they have done so. If I still had the opportunity to talk about these thoughts with Bateson and say: "Look here, Gregory, don't we both have this position?", he would perhaps say: "Yes, Heinz, that is a consequence." And I would say: "Gregory, for me that is the beginning. Your idea of "pattern which connects", etcetera., - flows from your central position: That you don't want to separate yourself from all of us and from the cosmos, but that you consider yourself to be a part of this whole world." In my philosophical system I begin with the basic statement: "I am a part of the world;" and I start with the experiment: "Do we want this or do we want that?" In terms of this in-principle undecidable question, I have decided to declare myself a part of the world. When I do that, I can let all kinds of consequences flow from this position. They are called cybernetics, ethics, systemics, etcetera, etcetera. For me it is such that the other statements, the circularity, the connectivity, all of these theorems that appear in cybernetics, systemics, etc., are *consequences* of this basic position. The position is a choice, and not a consequence. Because if it were a consequence, it would be a necessity. I, however, claim: It is not a necessity. It is a position that we can elect from all sorts of other positions.

What has struck me the most is the proximity of these thoughts that we discuss here to the teachings of the Tao. Chuang Tzu has written an entire series of parables, analogies and insinuations which I as a young man consumed with the greatest enthusiasm. There I found again and again the point where he says: "We must understand that we are one with nature. It is not like that there are various parts flying around in the universe. The essence of our idea is that we are a unity. The one emerges out of the other and the other emerges out of the one".

Monika Broecker has a Masters degree in Science of Communication. In 1998 she began working closely with Heinz Von Foerster. She trained at the Mental Research Institute in Palo Alto with Paul Watzlawick, Richard Fisch and others. Monika Broecker can be reached by email: hvf@earthlink.net. The translation of these conversations was done by Barbara Anger-Diaz.



6.26.01
Rattlemaker Hill

The Biological Computer Laboratory

Excerpts from an article by Stuart A. Umpleby, *The George Washington University, Washington, DC 200052 November 2001*

Almost from the beginning it was apparent that the Biological Computer Laboratory (BCL) was not an ordinary university research group. One of the most amusing episodes in the history of BCL was the series of events that led up to Heinz's being mentioned in the cartoon strip Pogo, a distinction for scientists even rarer than the Nobel Prize. Someone at the National Institutes of Health wanted a mathematical model of the population dynamics of white blood corpuscles. By working on this problem Heinz became interested in the dynamics of populations, both those whose elements interact and those with elements that do not interact. He figured that data on human population growth would be the most complete set of data for a population with elements capable of communication. The result was an article in *Science* in 1960 by Heinz Von Foerster, Patricia Mora and Lawrence Amiot called "*Doomsday, Friday, 13 November, A.D. 2026.*" They found that the equation which best fit the data was not an exponential but rather a hyperbolic equation. There is a major difference. If population is an exponential function of time, population will become very large as time increases, but within a limited period of time the population will remain finite. A hyperbolic function, however, has asymptotes. That is, there will be a time at which population will go to infinity. Applying the method of least squares to parameterize the equation led to the date 2027, hence the title of the article.

The Enemy is Us

—Pogo

There followed one of the most entertaining exchanges of letters ever to appear in *Science*. The idea that the human population could, through communication, form a coalition and engage in a game against nature was a particularly troubling idea. One demographer called attention to the widely accepted view that industrialization reduces rather than increases population. Heinz and his colleagues pointed out that, if an inverse relationship between population and technological know-how is applied to the human population over the last couple of millennia, then "either Stone Age man was a technological wizard, who carefully removed his technological achievements so as not to upset his inferior progeny, or "our population dwindled from a once astronomical size to the mere three billions of today." The BCL equation turned out to be considerably more accurate than other forecasts in predicting world population in 1970. The others were more conservative. However, 1975 data suggested that world population had moved ahead of even the BCL equation.

In addition to research the Biological Computer Laboratory also had a significant impact on the students at the University. On even the largest college campuses there is usually a small group of students who are innovators in campus activities. At the University of Michigan the Mental Health Research Institute with James G. Miller, Anatol Rapoport, Kenneth Boulding, John R. Platt, and Richard L. Meier was a focus of innovative activity. Tom Hayden and Carl Oglesby were students of Kenneth Boulding. Boulding once said that **Students for a Democratic Society** was born in his living room as a result of a seminar in economics. The Biological Computer Laboratory served a similar function at the University of Illinois. Over the years Heinz's students produced a **Whole University Catalogue**, a book on **Metagames**, an **Ecological Sourcebook**, and a large volume on the **Cybernetics of Cybernetics**.

It is easy to understand why there was always a feeling of excitement around BCL once one understands Heinz's views on education. Heinz notes that most of contemporary education is designed to make students react to a question in exactly the same way.

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therapeutic force.

Y: But you said, "If you want to be yourself; "change!" How can you be yourself and change?

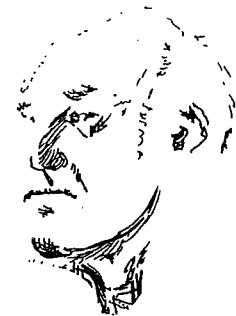
H: I wanted to appeal to ancient wisdom. It is 2600 years old and comes from the *I Ching*. Under the 58th symbol "Fu," or "The Turning Point," it says, "*The ultimate frame for change is the unchanging.*"

Y: (Smiling) This conversation with you, Heinz, has been a joyful and exciting day of learning. It seems to have mirrored the theme of our conference; ethics and family therapy. It feels as though I've discovered a new freedom within a precise and rigorous framework. This framework, clearly defined by the fundamental guidelines of therapeutic practice, encourages communication with another, thereby creating a new space. Does this not broaden our possibilities by redrawing the line of the horizon? If rigor were combined with creativity, the ethics of choice could also be the ethics of change!

At least that is the very personal understanding which I have gained from our encounter. I now have an exquisite diffused feeling of a door which opens onto another door, which opens onto another door, which opens onto another door....

From The Paris Paper:

*Ethics and Second-Order Cybernetics
Prepared for the International Conference
Systems and Family Therapy
Ethics, Epistemology, New Methods*



Knowledge Architect, Kathleen Forsythe, sends us this description of the gift she received from Heinz.

I have been involved with the American Society for Cybernetics since the early 1980's when I traveled to California at the suggestion of Gordon Pask and encountered his tribe, an extraordinary collection of beings including the wonderful storyteller and magician, cybernetician extraordinaire, Dr. Heinz Von Foerster. It was at this conference that I first heard the oral history of the ASC, of the beginnings of cybernetics, from the great stories told by Heinz of his escapades with his friends. His friends included Margaret Mead and Gregory Bateson of whose work I was aware. I quickly figured out that I was in the midst of giants although they were so human and welcoming that I felt that I, too, belonged.

Five years later, I was traveling to another ASC conference and found myself with Heinz as the only two passengers on the bus from the airport to Virginia Beach. I was quite overwhelmed at first and frightened to talk to him about my ideas. I had been having massive brainstorming sessions as I found my consciousness reconfigured by the insights of second order cybernetics. It didn't help that I found myself alone for 2 hours with the magician behind it all!

I had come to the realization that learning was the perception of newness. Easily said, yet hidden in the words, was the amazing realization of how it was the perception of distinctions, new to the system, from which learning arose; and it was the disposition for wonder, the emotional state of opening to the possibility of newness from which awareness arose. I had taken on the task of creating a children's television program that would model this insight for children through the use of a metaphoric story about the journey to the lands of new. I was going to speak about it at the conference.

(see PATTERNS, September 1998)

Tests are given to determine how successful the system has been at making the student a completely predictable member of society. The higher the score, the more predictable the student. In other words the purpose of education is to turn nontrivial systems into trivial systems. Heinz, following Herbert Brun, defines an illegitimate question to be one for which the answer is known. A legitimate question is one for which the answer is not known. Hence formal education is mostly concerned with illegitimate questions. At BCL the emphasis was on learning to ask legitimate questions.

*Said Heinz there are two kinds of questions,
To some there are answers in lessons,
But the questions that count,
The ones to surmount,
Are the questions that not yet are questioned.*

Because of his highly entertaining as well as thought provoking manner of speaking, Heinz was a frequent lecturer on campus. One of the first times I heard him speak was about 1964 at the weekly luncheon series at the YMCA. In his talk Heinz predicted that in the years ahead people would make three discoveries. First, they would discover that the earth is finite. That is, population growth cannot continue indefinitely. Second, people would learn that power resides where information resides. Third, human beings would discover that A is better off if B is better off.

Events have tended to follow these predictions. In 1968, Paul Ehrlich published **The Population Bomb**, and gradually people became more aware of rapidly increasing population and the impossibility of sustaining the high growth rate for very long. Regarding the second prediction, the 1970's brought greater attention to global communications - satellites, television, computer networks - and also revelations about the covert activities of the CIA and the FBI. In 1975 documents were made public which showed that during World War II the Allies were able to listen to the message traffic of the German and Japanese high commands. Alan Turing was a central figure in this work. It was no accident that World War II was such a successful war for the United States. This new perspective on World War II helps to explain the interest of the intelligence agencies in cybernetics research. The U.S. government had learned that power resides where information resides.

The achievement of Heinz's third prediction - people will realize that A is better off when B is better off - seems to lie within our grasp. The Cold War is over. Europe is becoming united, and nations are working together as never before.

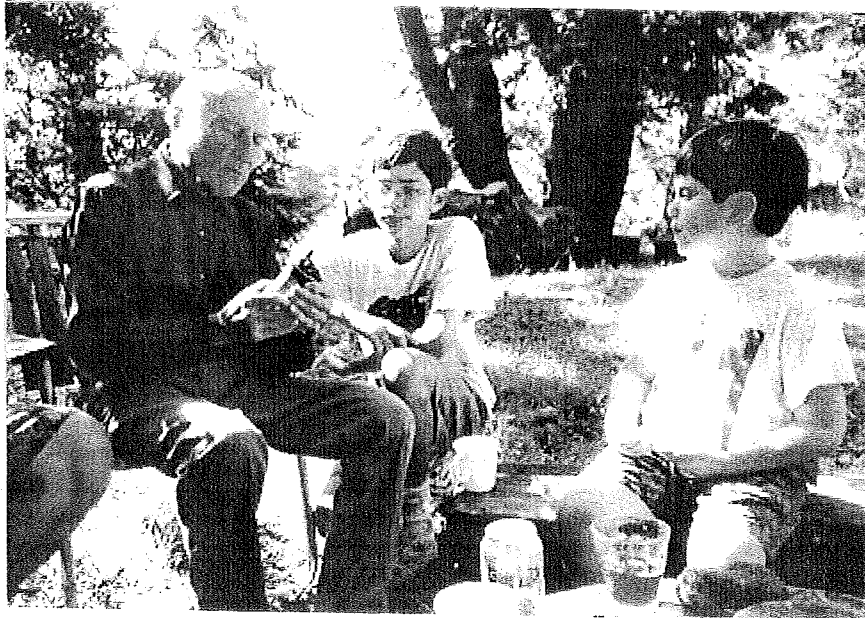
In about 1974, I mentioned to Heinz the three predictions he had made a decade earlier. He had forgotten about them, and he attached little significance to them. He said he had put them together a short while before giving the talk because he thought they would amuse the audience. But for me, those three predictions remain an example of Heinz's depth of insight, broad human concern, and faith in the eventual good sense of his fellow human beings.

Lest this description of the activities at BCL leave the reader with the impression that the laboratory led an untroubled existence, I should say a few words about the difficulties that Heinz faced. BCL was a leader. It was chronically ahead of its time. There was an exuberance at BCL that some interpreted as lack of seriousness. Quite a few people thought that anyone with an interest in physics, linguistics, art, music, dance, and anthropology must be a dilettante. And more than a few people suspected that calling attention to perception was somehow subversive. While the lack of understanding was unfortunate, it did not greatly matter as long as Heinz maintained his reputation as a successful grantsman. But then came the Mansfield Amendment. Most of the early work on cybernetics had been supported by the Office of Naval Research and the Air Force Office of Scientific Research. But in about 1968 the Mansfield Amendment put an end to research projects supported by the Department of Defense that were not clearly related to a military mission. It was intended that the National Science Foundation and other agencies would pick up the support of projects that had been funded by

DOD. The problem of course was that these agencies did not have people who were familiar with the work in cybernetics. There followed several frustrating years of searching for new sources of support. Meanwhile, Ross Ashby and Gotthard Gunther had retired and left the University. Finally in 1975 Heinz retired and moved to California. The University decided not to hire new faculty members to continue the work of BCL. For those familiar with the laboratory, it was a heartbreaking end to a remarkable episode in the history of science.

Ted Kahn writes that Heinz and his wife, Mai, have been close friends of **DesignWorlds for Learning** co-founders, Ted and Frona Kahn—and later of their sons, Yoni and Aaron—since Heinz became a member of the National Advisory Board of the **Atari Institute for Educational Action Research** which Ted founded and directed in 1981-83.

Below is a photo of Heinz with our sons (demonstrating a remarkable mechanical hand-held calculating machine) taken at his home in Pescadero about 5-6 years ago.



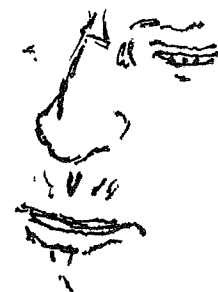
“Without interaction and feedback there is no learning. I can share information, and technology and the Internet have enabled that, but understanding requires feedback. It is an essential element of cybernetics. Remember, the hearer, not the speaker, determines the meaning of an utterance. You have to interact to be a good teacher. You can see in the eyes of a child whether they understand what you are saying. It is up to the student, then, to do something with it, to learn with it. Learning emerges in the experience of interaction - it's like a dance.”

Heinz von Foerster

I finally told him about what I had been doing. He listened in rapt attention then clapped his hands excitedly congratulating me on my amazing work, saying, “Why this is truly wonderful!” I never doubted his praise for I knew that I had indeed understood something very fundamental even though I had no academic credentials to substantiate my understanding. With Heinz, this did not matter; the thinking and ideas were what was important. This gave me the confidence to continue the journey to the lands of new.

Although I was involved with Heinz at other conferences and I also got to visit him at Rattlesnake Hill on a number of occasions, I never really spoke with him again about my own insights. I didn't need to. He had responded in that moment as the excellent teacher that he was, honoring the autonomy of my own construction and establishing me as a peer worthy for him to listen to.

Over the many years since then, I have come to know much more of Heinz's own work. His contribution to the world has been truly extraordinary even if not fully recognized. In particular, I came to know that his work on perception, which I had somehow internalized through the conversations at ASC conferences, was probably the basis of my insight. Yet, Heinz did not correct me at the time - it was this moment we shared in which he validated me, for which I am most grateful to have known him,



Heinz von Foerster, the scientist, the man

by Francisco Varela

This is taken from an introduction to an interview by Stefano Franchi, Güven Güzeldere, and Eric Minch available on the website <<http://www.stanford.edu/group/SHR/4-2/text/varela.html>> The late Francisco Varela writes: As the dust with time, the role of Heinz von Foerster in contemporary science becomes sharper and more vivid. This Interview takes us with ease and humor into some of the background and the grounds for this statement.

I cannot write about Heinz without saying that I owe him a lot not only intellectually but also personally. As the interview recounts, in 1962 he met Humberto Maturana, a Chilean neurophysiologist who was to be my undergraduate mentor in 1965-68. Thanks to that (for me) lucky encounter, I found laying on table counters articles by Heinz with such titles as "A Circuitry of Clues for Platonic Ideation" when I arrived at Humberto's lab in Santiago. It was to have similar effects on me as that recounted by Heinz in encountering Scheminsky on artificial life: it sent my imagination flying into a hyperspace of ideas and style of work from which I have never recovered. Besides, Heinz's style is one of posing questions and main principles in a concise form, which made his writings intellectual zettels I had in my pockets by the time I arrived as a graduate student at Harvard in 1968. By then, the wind had begun to blow in the opposite direction: I found virtually nobody to talk to about these issues. McCulloch had already retired from MIT, and the AI Lab was under the dominance of Marvin Minsky, who excelled at exorcising what we saw as "unproductive stuff" (from today's perspective, that is quite ironic). Heinz kindly invited me to come to Illinois a few times during the time I was in Cambridge, and each time I was touched by the humor and openness of this Viennese.

After returning to Chile in 1970, we developed with Maturana the notion of autopoiesis, and the first paper published on it owes a tremendous amount to Heinz's comments and corrections during a long stay in Chile during June-August 1973, when the rumblings of civil war were only too evident. Heinz was perhaps the first who recognized immediately the interest of this idea at a time when almost everyone else wanted us to drop such idle speculations. A similar experience was to be repeated in 1974 when Heinz was again instrumental in making my calculus of self-reference quickly accepted and disseminated, when I was stranded in Costa Rica after escaping Pinochet's Chile.

Since then and until today Heinz has been an untiring ear and friendly advisor. His ethical and human qualities are impeccable, and they have been a source of much needed inspiration. Thus, this is the right place for me to restate all my enormous debt towards him. Without his influence and his presence for the last 30 years, my life would have lacked a deep, joyous, and nourishing dimension. I call him Heinz the Great.

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- 1 Howard Gardner, *The Mind's New Science: A History of the Cognitive Revolution*, (New York: Basic, 1985); Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Chaos and Order* (New York: Simon, 1992); Steve Heims, *The Cybernetics Group*, (Cambridge: MIT Press, 1991); Jean-Pierre Dupuy, *Aux origines des sciences cognitives* (Paris: La Découverte, 1994).
- 2 Heinz von Foerster, *Observing Systems: Selected Papers of Heinz von Foerster* (Seaside, CA: Intersystems Publications, 1981).
- 3 Francisco Varela, Humberto Maturana and Ricardo Uribe, "Autopoiesis: The Organization of Living Systems, Its Characterization and a Model," *Biosystems*, 5 (1974) 187-196.
- 4 Francisco Varela, "A Calculus for Self-reference," *International Journal of General Systems*, 2 (1975) 5-24.
- 5 See also an interview at <<http://www.stanford.edu/group/SHR/4-2/text/varela.html>>

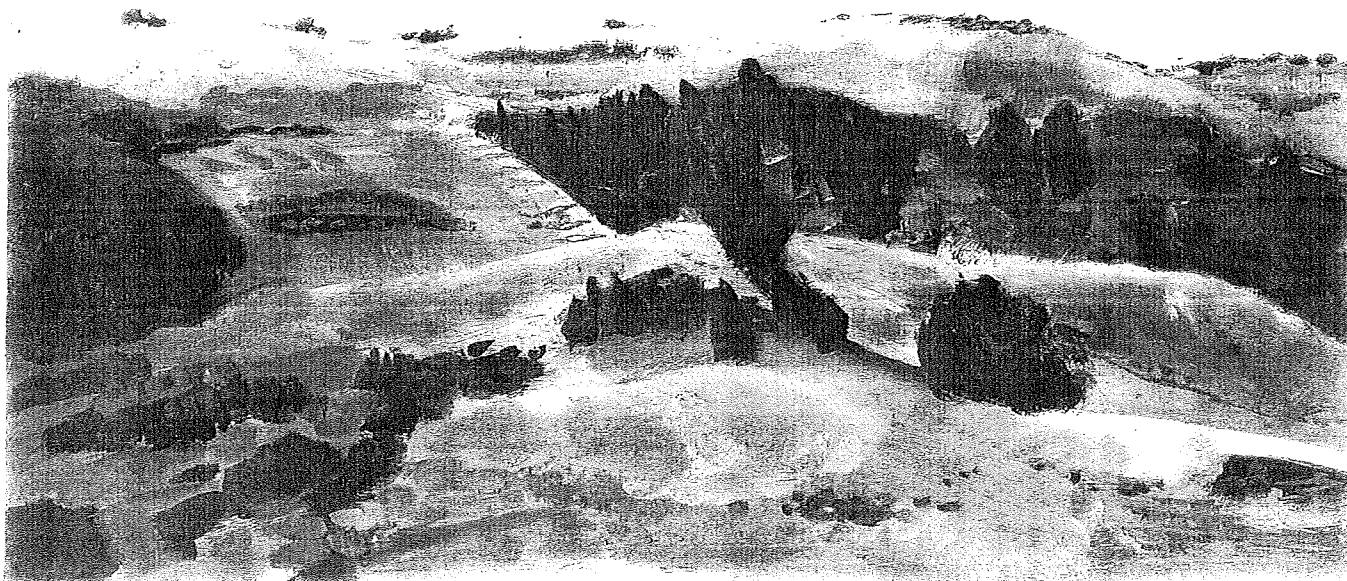


In August 2002 Michele Norman and Ted M. Kahn interviewed Heinz concerning his views on education for Converge Magazine. See <<http://www.convergemag.com/magazine/>> for the full text.

They write: "This interview is a toast and tribute to von Foerster. Read it while listening to a Viennese waltz and please, share it and discuss it with those around you. As von Foerster emphatically says in his still lingering Viennese accent, "Dialogue is the essence of life. Ja?" A transdisciplinary thinker, magician and master teacher, Heinz makes every dialogue and interaction an unforgettable learning event.

Heinz's response to the question; How has thinking about learning first guided you in your interactions with your students? indicates the role of the teacher who truly respects others.

He replies; "Margaret Mead once suggested that I write a book on cybernetics. I took her advice and conducted a research experiment with my own students at the University of Illinois. Instead of assigning a textbook as in traditional classes, I had my students (some of them were only freshmen!) design, write and edit their own textbook for this course as their final class project. Together, they used the principles and leading thinkers of cybernetics as resources to explore cybernetics. The question posed was simple, "What would you like to tell others about cybernetics?" The book, "Cybernetics of Cybernetics" was published in 1974 and includes more than 400 pages of research, articles by different experts, illustrations, interviews, games and other tools that define, explain and demonstrate cybernetics. It is a classic in this field. The students were curious and excited and learned so much; so much ingenuity came from the experience. You have to focus on the process. Dialogue is the beginning. If you listen, you come to an understanding."



View of Rattlesnake Hill

--Christina Waters August 2002

What is Cybernetics and the American Society for Cybernetics?

Ernst von Glasersfeld has written that every cybernetician has his or her own definition of cybernetics, because each one of them came out of the cracks between different disciplines in order to understand purposive thinking and the goal-directed actions of people and machines.

When these individualists discovered that in spite of all their differences there were ideas on which they could agree, they founded a Society. It is a society without an established philosophical dogma and without the need to protect the holy cows of other sciences.

writes;

The field of cybernetics is distinguished by the questions it asks and how they are asked. These questions tend to be those that are in principle undecidable, and "only questions which are in principle undecidable, we can decide." (Heinz von Foerster)

This form of questioning distinguishes cybernetics from virtually all of the sciences; it in fact seeks "to cure all temporary truth of eternal triteness." (Herbert Brun)

Cybernetics is "a way of thinking, not a collection of facts." (Ernst von Glasersfeld) It is a way of thinking about questions, about questioning, and about ways of thinking (of which it is one) This recursive aspect of cybernetics requires a conceptual focus different from that of other fields of endeavor. That focus is dynamics and process, rather than substance and objects. Change (or difference) is the fundamental entity in cybernetics. Rather than dealing with matter and energy, cybernetics deals with form and pattern, information and organization. Of particular interest are systems in which "complexity[in dynamic patterns of behavior] is outstanding and too important to ignore." (Ross Ashby)

Cybernetics is itself neither a science nor an art; yet, the work of cybernetics is in "the science and art of understanding." (Humberto Maturana) In this work, science and art form a partnership, both getting transformed in the process.

The American Society for Cybernetics is a collection of people interested in generating undecidable questions, exploring alternative logics, learning to be rigorous and creative with language, and doing so in a participative, dialogic process. There is a recognition that this form of activity does and must lead to a political agenda. Yet, the focus of the activity is not on any particular agenda; it is on the process. An awareness that there are political consequences of this activity suggests that cybernetics be promoted as offering, among other things, a framework for exploiting strategies for social transformation..."



This special issue of PATTERNS, a bi-monthly publication of the Systems Thinking/Chaos Theory Network, sponsored by the Association for Supervision and Curriculum Development, marks an evolutionary development in the purpose of this endeavor.

Since January 1996, when our first issue contained an interview with Dr. Ralph Abraham, one of the founders of Chaos Theory, we have sought to bring educators who are entrusted with the guidance of our children at all levels of the system and the "new" scientists" together to explore how this new thinking is useful in designing/inventing a global society that works for everyone.

We are now exploring the development of an editorial board made up of representatives from the various academic societies who feel a need for enhanced communication among themselves and educators who are on the cutting edge. In this way we hope to contribute, electronically and in print, a publication that will be a useful evolutionary tool.

You are invited to contribute your ideas by contacting:

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You are invited to join us as a member of the ASCD sponsored **Systems Thinking and Chaos Theory Network**

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