



## ASC Meeting 2011 (9-10 August)

### **GBM (August 9 morning)**

The General Business Meeting (GBM) of the ASC (American Society for Cybernetics) will be held at the Quality Inn Hotel and Conference Center from 9am until lunch time on 9-Aug-2011. This meeting, open to all members of the ASC, is the primary business of meeting of the society, at which the president's and treasurer's reports are presented to the membership for approval, and members may raise any matters they feel appropriate. Non-members are welcome, only ASC Members can vote.

### **Cybernetics of Cybernetics Competition Results**

A discussion of the entries to the recent Cybernetics of Cybernetics Competition

### **Changing Cybernetics Seminar**

A review of two short films facilitated by Thomas Fischer (see transcripts on the following pages)

## Pre-Conference Tutorials (10 August 2-5pm)

### **Gregory Bateson's Epistemology – Tutorial conducted by Phillip Guddemi**

Gregory Bateson is famous for “the difference that makes a difference,” which is always a difference to someone (or more rarely, something). It is not always appreciated how deeply Bateson's epistemology and worldview is centered in the observer, and how much it refers back to the observer. We will look at his analysis of how to draw delineating lines, to show that the definition of a system is always done by an observer and with reference to one. We may also look at his observer-centered analysis of entropy. And we will especially look at his definitions in the book *Cybernetics of Cybernetics*, of Adaptation, Double-Bind, and Conditioning — to see how these interactive processes with “environment” are described in Bateson's epistemology. We will think about the implications of this observer-centeredness for differences among observers and why it mandates empathy and listening.

### **From Rosenblueth to Richmond: A Historical Review of Cybernetics - Tutorial conducted by Randall Whitaker**

Ask someone on the street what ‘cybernetics’ is, and they're likely to say it's got something to do with robots, computers, and / or the Internet. Ask someone in academia, and they're likely to say it's an antiquated atomic era meme or a transdisciplinary experiment that spawned (e.g.) robotics, AI, control theory, and a variety of organizational management theories before fading away. Ask anyone why a cybernetics society would hold a conference on ‘listening’, and the likely response would be ‘huh?!?’. This tutorial will provide a historical review of selected themes and developments explaining how ‘cybernetics’ isn't what most people think it is, and why in its current second-order form cybernetics indeed has a proper interest in interpersonal communication (e.g., ‘listening’).

# A Communications Primer (Transcript/Notes)

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*by Ray and Charles Eames, 1953; length: approx. 23mins*

Communication, from the Latin *communicatio*.

1. Act or fact of communicating. As communication of smallpox, of a secret, or a power.
2. Intercourse by words, letters or messages, interchange of thoughts or opinions...

In the broadest aspects of communication, much work has recently been done to clarify theories and to make them workable. The era we are entering might well be characterized as an era of communication.

This film will touch, in the most elementary way, some aspects of the subject that are of daily concern to all of us. Here is Claude Shannon's diagram by which almost any communication process can be schematically represented.

The information source selects the desired message out of a set of possible messages, the transmitter changes the message into the signal, which is sent over the communications channel to the receiver where it is decoded back into the message and delivered to the destination. Every such system contains noise. Noise is a term used in the communications field to designate any outside force, which acts on the transmitted signal to vary it from the original. In this usage, noise does not necessarily mean sound. Reading is a form of communication where the word is the signal, the printed page the transmitter, light the channel, the eye the receiver. Here sound can act as noise and interfere with the message. But in some situations like reading on a train where the sound level is normally high, it is not the sound that interferes with the communication process, as much as the motion and the unpredictable quality of the light source. Quality of light and motion then becomes noise.

In radio, noise could be static. In television, noise is often the distortion of the picture through transmitting or receiving. In a typewritten message, the noise source could be in the quality of the ribbon or the keys - and we're all familiar with the carbon copies that keep getting progressively worse.

If anything acts on the signal so as to bury it in an unpredictable and undesirable way in the communications system, it is noise.

We can consider telegraphy in terms of this same diagram. We will use a New York stockbroker's office as the information source and a Los Angeles stockbroker's office as the destination. There may exist at the information source just two possible messages: BUY or SELL. From these two, the message SELL is selected, then coded by the telegraphic key, which is a transmitter, and sent over the channel in electrical impulse signals, decoded by the receiver back into the message SELL, and delivered to the destination.

Noise of course is there, this time acting electrically. It could distort the signal in such a way as to change SELL into SELF, but as there are only two possible messages, BUY and SELL, there is sufficient redundancy in the spelling of the words that even if it did read SELF, the information would still be clear.

Naturally, this example has nothing to do with the stockbroker's office of today, because of all organized communication, market information is perhaps the most efficiently handled. The New York information enters the signal channel in this form and is automatically decoded in Los Angeles in this form. But even here we find redundancy counteracting noise.

The English language is about one-half redundant. This extra framework helps prevent distortion of the message in the written language or in the spoken language.

In speech, the brain is usually the information source. From it the message is selected - the messages of thought, not the words. The vocal mechanism codes the words into vibrations and transmits them as sound across the communications channel, which is of course the air. The sound of the word is the signal. The ear picks up the signal and with the associated eighth nerve decodes the signal and delivers the message to the destination.

This time, noise could originate in the transmitter or in sound vibrations that disturb the channel. Or it could be a nervous condition on the part of the receiver and it could change the message from I

LOVE YOU to I HATE YOU. How do you combat it? One way is through redundancy - I LOVE YOU, I LOVE YOU, I LOVE YOU, I LOVE YOU. Another is increasing the power of the transmitter; this combats noise, as does the careful beaming of the signal, or duplicating the message via other signals.

Now let's consider amount of information communicated. The message SELL contained one bit or unit of information because it was a choice of two possible messages, BUY or SELL. A choice of two gives one bit of information. This is the amount of information that one on-off circuit can handle at one time. It can be on or off.

Two bits of information is the amount two circuits can handle. There is a choice of four possible conditions: on-off, off-on, on-on, or off-off.

Three circuits can handle three bits, or a choice of eight possibilities. Four circuits, four bits, or 16 possibilities. Five bits, 32 possibilities. Six bits, 64. Amount of information increases as the logarithm of the number of choices.

The message I LOVE YOU, to communicate information, must also be a choice of other messages, because if the information source were so loaded with feelings of love as to be incapable of any other thought, then surely by the time the words I LOVE YOU were spoken, no information was communicated at all. No information; yet previous experiences could make those three words convey great meaning.

Source, message, transmitter, channel, message, destination. You could imagine the message being music and the transmitted signal being tone, or it could be applied equally well to writing, or to smoke signals, or to hand signals. But let's take painting as another example of a signal transmitting a coded message.

Information source, mind and experience of painter. Message, his concept of a particular painting. Transmitter, his talent and technique. Signal, the painting itself. Receiver, all the eyes and nervous systems and previous conditionings of those who see the painting. Destination, their minds, their emotions, their experience.

Now in this case, the noise that tends to disrupt the signal can take many forms. It can be the quality of the light, or the color of the light, or the prejudices of the viewer, or the idiosyncrasies of the painter. But besides noise, there are other factors which can keep the information from reaching its destination intact. The background and conditioning of the receiving apparatus may so differ from that of the transmitter that it may be impossible for the receiver to pick up the signals without distortion.

In any communication system, the receiver must be able to decode something of what the transmitter coded, or no information gets to the destination at all. If you speak Chinese to me, I must know Chinese to understand your words. But even without knowing the Chinese language, I can understand much of your feelings through other codes we have in common.

There are systems of communication where there is no redundancy and no duplication of the message. Here knowledge of the code is essential. In planning 'One if by land, two if by sea', the fellow on the opposite shore simply had to know the code. But there are also many examples of times when the message has been conceived and the signal sent long in advance of understanding or acceptance of the code employed. In the case of Galileo or Socrates, it did not in time matter that the receivers of their time were not tuned to receive their signal. The ultimate transmission of such a message represents communication of a very complex order.

Other high-level communication occurs in very different areas. A wave breaking on a beach brings a world of information about events far out at sea. It can tell of winds and storms, the distance and the intensity; it can locate reefs and islands and many things if you know the code.

When we watch them turning and wheeling, how often have we wondered what holds such birds together in their flight? Communication is that which links any organism together. It is communication that keeps a society together, and though these people seem unaware of each other's existence, neither looking nor speaking, one group meets and filters through the other with hardly two individuals coming in contact. So constant is the flow of information and so complex the web of

communication that keeps them apart and holds them together.

The symbol - the abstracting of an idea, communication at once anonymous and personal. Personal because of the countless individuals that created its form, each one who in his turn added something good or who took something bad away. Anonymous because of the numbers of individuals involved and because of their consistent attitude. These are examples of communication of an idea through symbols.

But there can also be communication through symbols to an idea, as in the burnt offering or in the flame of a candle. The use of flame as a transmitter in the communications channel is probably as old as man's first fire. It stands for all the wonder and mystery of forces beyond man's knowledge.

The storm warning flags are part of a long, evolutionary tradition of signals, but their beginnings were probably in basic reactions to color and form, basic enough to make their communications carry beyond the barriers of language and custom.

But symbols also change and evolve. Some methods of transmitting messages rapidly become symbols, then pass into obscurity to become readable only to the anthropologist, while other symbols of communication remain.

The message being transmitted here may be unlimited in the range and subtlety of its ideas yet the method and the signal are such that they must be fed to the transmitter in a series of positive decisions. The system calls for the key to be either up or down. The code calls for a dot or a dash. The current flows, it ceases to flow, it flows. It is black or white. It is STOP or GO, on or off, one or none, go or no go, or black or white as in this small area from a half-tone reproduction in a magazine.

The press that printed it is capable of printing but one color of ink at a time, in this case black ink on white paper. In order to transmit the image, it had to be broken down to many points of decision, black or white. We know that such a limitation is not at all restricting if enough decisions are made. In this case,

half a million decided points give a fair rendition, a million would be better.

Conventional printing of color is no different, except that with the added factor of color, four times the number of decisions have to be made, one set in yellow, one in red, in blue and in black.

Whenever added factors in a problem are recognized, the number of decisions necessary for the solution grows by large leaps. As theories and equipment and men develop, it becomes apparent that one sure way of handling multiple factors is to build a system that can handle each decision in its time.

Men have long known the theory on which complex problems of many factors can be solved, but the number of decisions, the calculations necessary were prodigious. Not until the recent development of the electronic calculator could these areas be touched. The problem became one of communication between man and machine, between machine and machine, between machine and man. The cards are punched or not punched, light passes or stops, and by this binary system, information is fed to the machine. In a moment, we will hear sounds, which are an actual product of a huge calculator. The frequencies are made audible to check its functioning and, in a way, feel its pulse. Here it is.

The ability of these machines to store information, manipulate, sort and deliver it, is fantastic, and with their complex feedback systems, their memories, their almost human reactions to situations, it is understandable that they are popularly referred to as 'brains'. The greatest fallacy in the comparison is one of degree. The decisions made by the machines are comparable in number to the half-million in this half-tone, but far greater are the number of stops and goes performed by the human nervous system in order to complete the simplest act. So great that if each decision were represented by a small half-tone dot, the total area of dots would cover several Earths. Such is the magnitude we reach when a number like a half-million is raised to the fourth power.

As flowing as the human movements may seem, they are actually the product of these countless

yes/no decisions communicated with great speed to and from all parts of the body. The channel is the nervous system. Each nerve is made up of hundreds of fibers. The decision is the impulse of a single nerve fiber, an all-out event, a trigger process which is set off like an explosion when the stimulus exceeds the ignition point. The dot in the half-tone, the hole in the tape - each is a separate fire/no-fire signal, but together they add up to a smooth, sometimes incredibly complex action that often seems more vague than decisive. Yet many things that we accept as undecided vagaries would be, if we could bring our focus in sharp, decisive individual units. It is the responsibility of selecting and relating parts that makes possible a whole, which itself has unity.

The line on which each color breaks, and the point at which each dot that makes up this painting is placed, affects the whole canvas. The communication of the total message contains the responsibility of innumerable decisions made again and again, always checking with the total concept through a constant feedback system.

These elements of a communications system act together as one great tool, and though the tool may perform a most complex task, it will never relieve the man of his responsibility, no matter where it occurs, no matter what the technique:  
Communication means the responsibility of decision, all the way down the line.

*[Credits and acknowledgements]*



# The Information Machine (Transcript/Notes)

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*Or: Creative Man and the Data Processor, IBM; Made by Charles and Ray Eames, 1957; length: approx. 10mins*

Since the time when man began to control the environment, he has been plagued by his limited ability to speculate: His failure to accurately predict the effect of a proposed action.

This is the result of his not being able to consider and relate all the factors in a problem. Evidence of this inability can be seen in the persistence of a certain kind of myth involving three wishes. In a frantic effort to reap immediate reward, the first wish is often not too wise. The second usually tends to over-correct. Our hero can consider himself lucky if after the last wish he ends up just where he started.

But there were men whose wishes were not only prudent, but had a habit of coming true. These men - and women - were artists and had certain characteristics in common. They were seldom bored with anything. They were constantly building up stores of information in active memory banks. When confronted with a specific need, they would call on these memory banks for information, which they would run through, sort out, and relate to the problem at hand. These men could speculate and could predict.

They were artists - artists in many fields: architecture, mechanics, medicine, science, politics, and the art of relating factors. It is often not a conscious art and the degree to which it is operative can tend to make one normal, bright, super bright or genius.

Numbers were used to count. But soon they were also being used as abstract symbols for states of being. Values were given to mass, speed, inertia and the forces of gravity. Such measurement was an enormous help to creative thinking. Man was learning to numerically relate and to predict.

Theories were developed by which the many factors in a problem could be numerically related. But the magnitude of the calculations necessary made many such theories impractical. In the last century the complications of our society have been compounding themselves and it began to look as though the science of numerical relationships could never catch up.

For a long time in the world of numbers man has been developing tools to help him handle increasing amounts of data. Something has now emerged that might make even our most elegant theories workable. The recent acceleration has been fantastic. The electronic calculator has already become a tool upon which much of our daily activities depend. A tool which has broadened the range of man's concepts and intuition, much the way other tools have broadened man's range of communications, man's range of travel or the phenomenal range of his control over environment.

With the computer, as with any tool, the concept and direction must come from the man. The task that is set and the data that is given must be man's decision and his responsibility.

This is information. The proper use of it can bring a new dignity to mankind. Properly related, it can maintain a balance between man's needs and his resources. In many aspects, these are information machines capable of storing, processing and relating a vast quantity of information. They process information so it can be made meaningful at the human scale.

Computers are generally used in any of three ways: First: As a control or balance. Second: As a function of design. Third: As a simulation or model of life, where we can see the effect before taking the action.

As a control or balance, the calculator keeps our complicated systems functioning. It determines the logistics of raw materials, its inventory and flow, history and performance of tools, and of personnel, production rates and quality, public utilities rates and flow, cost accounting, payrolls, billing, and all the ramifications of insurance, and, in addition, presents the broadest possible basis for making decisions.

As a function of design, the calculator provides creative man a higher platform upon which to stand and from which to work. Data processing removes the drudgery, but imposes new and broad responsibilities. The designer must be able to state precisely what it is he needs to know. This is not always so easy. He must form a general plan of procedure. This plan or program takes the greater part of all the time involved. He must write a concise step-by-step list of instructions translated into a digestible code and feed it to the computer. Then he must provide the machine with all pertinent background information and related data. The preparation may have taken months, the actual calculation hours or even minutes. But once set up, it can attack the problem with infinite variations and trustworthy memory.

Perhaps the most challenging use of the computer is the simulation of real situations. If, for example, a machine is properly programmed, and is provided with sufficient numerical data concerning a chemical plant, then the computer begins to take on the functions of a working mathematical model of that chemical plant in which it is possible to determine the probable effects of many possible courses of action.

Today there are working mathematical models of railroad systems, rocket engines, complete reactors and whole living communities. The calculator is helping to define society's most complicated problems. It is a tool for turning inspiration into fruitful prediction. As an information machine, it has done much to broaden the base of our growing concepts.

But the real miracle is the promise that there will also be room for those smallest details that have been the basis for man's most rewarding wishes. This is a story of a technique in the service of mankind.

*[Credits and acknowledgements]*



## The 2011 ASC Conference

The annual meeting of the American Society for Cybernetics for 2011 consists of the following components:

**Pre- Conference with the ASC General Business Meeting, the Annual ASC Event and Tutorials on (2nd order) Cybernetics (09-10 August)**

**The 2011 ASC CONFERENCE ON LISTENING (11-13 August)**

**Post-Conference Study (14-15 August)**

With special gratitude to our supporters:



# Welcome

We welcome you to the Listening conference of the American Society for Cybernetics, held in Richmond Indiana between 9 and 15 August 2011.

In our conference we will practise, but also reflect on and examine, the activity of listening. We do not take listening to be limited to the aural, not to be just a physical act: it is a way of being with others, and involves understanding, generosity and empathy. We take listening to be a crucial act, for it is listening that makes communication possible by engaging a second person with the first, the one who "utters". In this respect, listening makes community possible through communication, by conversation.

We welcome you to join in this study through acting with us. Our means of being together will be, primarily, through conversation, and there is no conversation without listening.

Perhaps we can modify the old saying: to talk is human, but to listen is divine!

We are delighted that Pauline Oliveros has agreed to join us to help us begin through singing together, and to entertain and enlighten us at our conference dinner.

We also welcome you to our pre- and post-conferences, where we will prepare for the main conference and deal with the business of the society; and we will study the thinking of two of our most loved members, Heinz von Förster and Ernst von Glasersfeld, through some of their publications.

We have been very fortunate in the support we have received in setting up our conference. Indiana University East, through the good offices of its Chancellor, Nasser Payday, has provided us with staffing resources and material help.

The staff of the conference site, the Quality Inn Hotel and Conference Center in Richmond, have been endlessly adaptable and encouraging. Our thanks to them and, in particular, Carla Eberwein (director of sales) and Kay Johnson (sales and catering supervisor). Also, we have been graciously supported by Stacey Whichard (director of sales and group event planning) at Richmond/Wayne County Convention & Tourism Bureau. Finally, Emerald Publishers has provided a grant to help pay for the reception, a book table, and free online access to a selection of journals they publish.

We hope you will enjoy and benefit from meeting with us and look forward to welcoming you to our conferences again.

## Conference Organizers

**Larry Richards** (conference co-chair, local organizer)

**Ranulph Glanville** (conference co-chair, ASC President)

**Thomas Fischer** (conference webmaster, ASC Secretary)

**Christiane M. Herr** (ASC Vice President, electronic publishing)

## International Advisory Board

The conference is honored to have collected a distinguished International Advisory Board.

We gratefully acknowledge the advice and support of all members of the IAB:

**Edith K. Ackerman, Roy Ascott, Graham Barnes, Julio Bermudez, David M. Boje, Flo Conway and Jim Siegelman, Bradford Keeney, Vincent Kenny, Hugo Letiche, Michael Lissack, Bruno Louchouart, Roger Malina, Robert J. Martin, Pauline Oliveros, Marcelo Pakman and Daniel Rosenberg**



## Theme: Listening

We live in a time which emphasizes the importance of giving people their voice. But, as Heinz von Förster noted, the listener makes the meaning, not the speaker, so it is the act of listening that transforms a stream of sounds into that meaning. The act of listening begins to make human interaction circular and creative.

As a subject, Cybernetics informs circular or recursive systems, and listening provides a key to circularity in human systems, allowing us to respond in appropriate manners, possibly leading into new territory, generating new ideas and creating choice. This is cybernetic circularity in action.

We also use the word listening "metaphorically", beyond its origin in hearing. But whichever metaphor we choose, listening requires opening up, having an open mind, and not judging until having listened properly and emphatically, not only to what is said, but also to what "what is said" does. Such heightened sensitivity, we argue, goes to the core of the idea of "caring" for and with each other.

In our conference, we will not only discuss and think about listening. We will also practice it. We intend not just to understand (and hence to position) "metaphorical" listening, but also to learn to do it better. Through listening, the idea of participation will come alive. We will enjoy each others' company, experience what we each have to contribute and leave the conference with ideas that none of us had when we arrived.

The ASC endeavors, each year, to reach out to new communities as well as those it has already established links with. Last year we welcomed artists, designers and mathematicians. This year we hope to add those in listening practices and professions—musicians, therapists, managers, educators and others—as well as our artist, designer and mathematician friends, to enrich our meeting.

## Conversation Starters

- 1. Listening as a creative, originating act (choices, alternatives, participation, betweenness)**
- 2. Listening to each other (social design--human awareness, desiring, caring, generosity)**



## Save 50% and become an ASC Member at the Conference:

Participants of the 2011 ASC Conference on Listening can become ASC members for 2011  
**at the special rate of US\$50.**

Student participants are welcome to join **at the special rate of US\$20.**

To use this valuable opportunity, talk to us at the conference registration desk.

To join the ASC after the conference at the regular rates:

**<http://www.asc-cybernetics.org/organization/membership.htm>**

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**Timothy Jachna**

Vice President  
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# Conference Program

## **Tuesday 09-Aug-2011 ASC Meeting day 1**

9:00a.m. to 12:00noon: Changing Cybernetics  
12:30noon to 1:30pm: Lunch  
2pm to 5pm: Cybernetics of Cybernetics Competition presentations/discussion  
6:30pm to 10:00pm: Dinner and Oral Tradition

## **Wednesday 10-Aug-2011 ASC Meeting day 2**

10am to 12noon: General Business Meeting  
12:30noon to 1:30pm: Lunch  
2pm to 5pm: Tutorials  
6:30pm to 7:30pm: Reception  
8pm: Jeff Glassman and Lisa Fey  
9pm: Susan Parenti and Mark Enslin

## **Thursday 11-Aug-2011 Main conference day 1**

9am to 9:30am: Welcome  
9:30am to 10:30am: ASC Awards  
10:30am to 12noon: Singing  
12noon to 12:30noon: Theme 1 Introduction  
12:30noon to 1:30pm: Lunch  
1:30pm to 4:30pm: Theme 1 Conversations  
4:30pm to 5:30pm: Workshops  
6pm to 7pm: Dinner  
7pm: Paper presentations (details t.b.a.)

## **Friday 12-Aug-2011 Main Conference day 2**

9am to 9:30am: Start the day meeting: planning, housekeeping and 4' 33"  
9:30pm to 12:30noon: Theme 1 Conversations  
12:30noon to 1:30pm: Lunch  
1:30pm to 2:30pm: Theme 1 Presentations  
2:30pm to 3pm: Theme 2 Introduction  
3pm to 4:30pm: Theme 2 Conversations  
4:30pm to 5:30pm: Workshops  
6pm to 7pm: Dinner  
7pm: Performances (details t.b.a.)

## **Saturday 13-Aug-2011 Main Conference day 3**

9am to 9:30am: Start the day meeting: planning, housekeeping and 4' 33"  
9:30pm to 12:30noon: Theme 2 Conversations  
12:30noon to 1:30pm: Lunch  
1:30pm to 3pm: Theme 2 Conversations  
5pm to 4pm: Theme 2 Presentations  
4pm to 5:30pm: Feedback and closing  
6:30pm to 9pm: Conference dinner. Guest speaker: Pauline Oliveros  
9pm to 10pm: Chris Mann

## **Sunday 14-Aug-2011 Post-Conference Paper study day 1**

9am to 12:30noon: Heinz von Foerster paper study  
12:30noon to 1:30pm: Lunch  
1:30pm to 5pm: Heinz von Foerster paper study

## **Monday 15-Aug-2011 Post-Conference Paper study day 2**

9am to 12noon: Ernst von Glasersfeld paper study  
12noon to 1pm: Lunch  
1pm to 4pm: Ernst von Glasersfeld paper study  
4pm to 5pm: Wind-up and close



# Food + Drink

## General Directions

In addition to the **restaurant and bar located in the Quality Inn** (the conference venue and one of the accommodation options), which will be open for light lunches and snacks, there are numerous eating establishments in the immediate vicinity. For those who arrive early and want to dine at one of the top restaurants in town, consider the following:

**The Olde Richmond Inn**, 138 South 5th Street (765) 962-2247  
(the restaurant of choice for many, a wide range of selections)

**Ghyslain Chocolatier & Bistro**, 416 N 10th Street (765) 966-3344  
(restored warehouse setting in Historic District, known for dessert specialties, chocolates to go, shops, open until 7:00 p.m. Tuesday – Thursday, 10:00 p.m. Friday – Saturday)

**Galo's Italian Grill**, 107 Garwood Road (765) 973-9000  
(speaks for itself, comfortable ambiance, substantial menu selection)

**J&J Winery**, 3415 National Road West (765) 965-WINE  
(country setting, outdoor seating available, wine tasting, Italian wood-fired oven, walking trails, shop)

**Hacienda Camino Real Mexican Restaurant**, 4712 National Road East (765) 966-5288  
(indoor/outdoor seating, closest of the above to the Quality Inn)

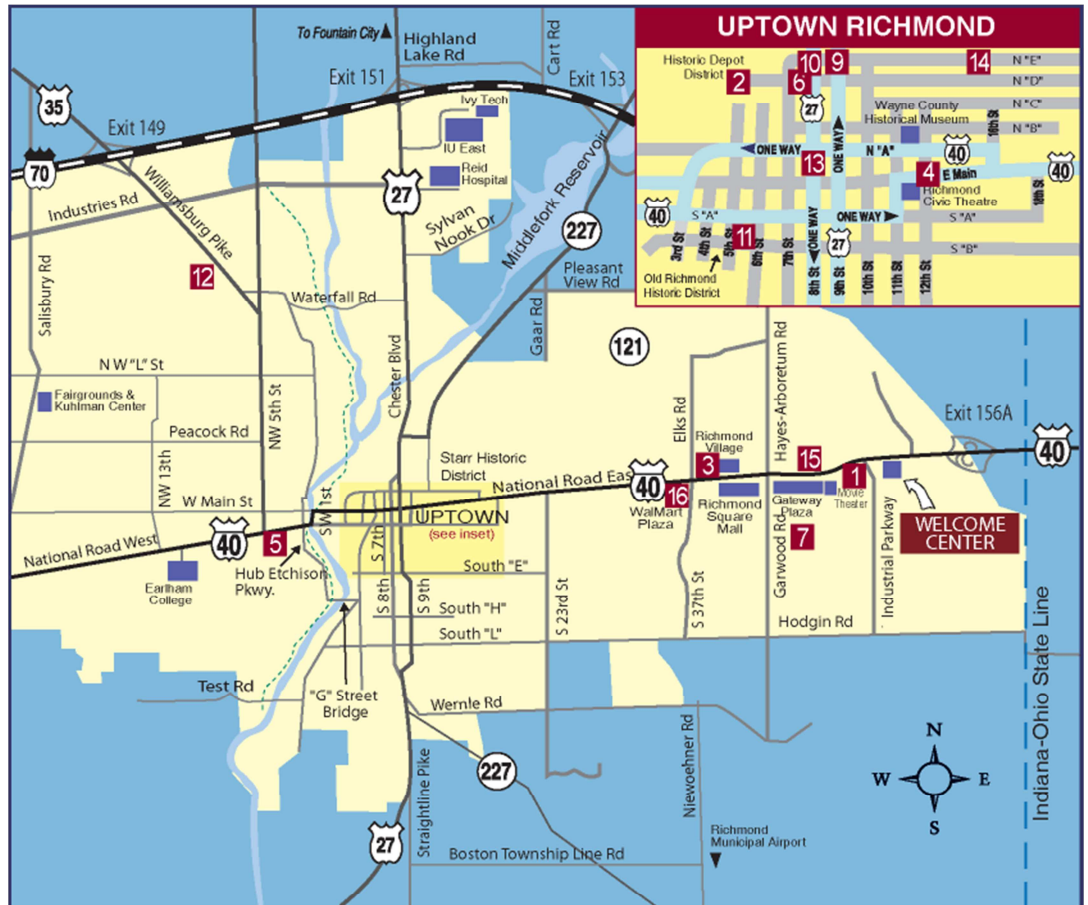
*Note that some restaurants are closed on Mondays.*

There are also chain restaurants nearby, including **Red Lobster** (directly across the highway from the Quality Inn), **O'Charley's**, **Applebee's**, **Chili's**, **Texas Roadhouse**, **Jade House** (Chinese menu and buffet), **Frisch's Big Boy**, **Bob Evans**, **IHOP**, as well as a **Starbucks** and many fast food places.

The late night pub of choice (for "young" people) is **Smiley's Pub and Beer Garden**, 39 North 8th Street, downtown Richmond (3.73 miles from the Quality Inn: Please plan your taxi ride back ahead of time. The hotel does not operate a shuttle service.). Note that this is a smoking establishment. We will also make arrangements for the **Quality Inn pub (The Underground)** to remain open in the evening if there is sufficient interest.

**For restaurant locations please refer to the Richmond/Wayne County Map and the Food + Drink Map on the following pages >**

# Richmond/Wayne County Map



## Host Hotel & Venue

- 1** Quality Inn Conference Center

## Shopping

- 2** Historic Depot District  
*Featuring over 30 unique stores and dining locations!*
- 3** Richmond Village (Walgreens - open 24 hrs.)
- 4** Uptown Richmond
- 7** Galo's Italian Grill
- 8** J & J Winery
- 9** Joe's Pizza
- 10** Little Sheba's
- 11** The Olde Richmond Inn
- 12** The Patio at Country Rib Eye Steakhouse
- 13** Smiley's Pub & The Oliver Twist
- 14** Wellings Steak House & Sports Bar

## Unique Dining & Lounges

## Eastside ATMs

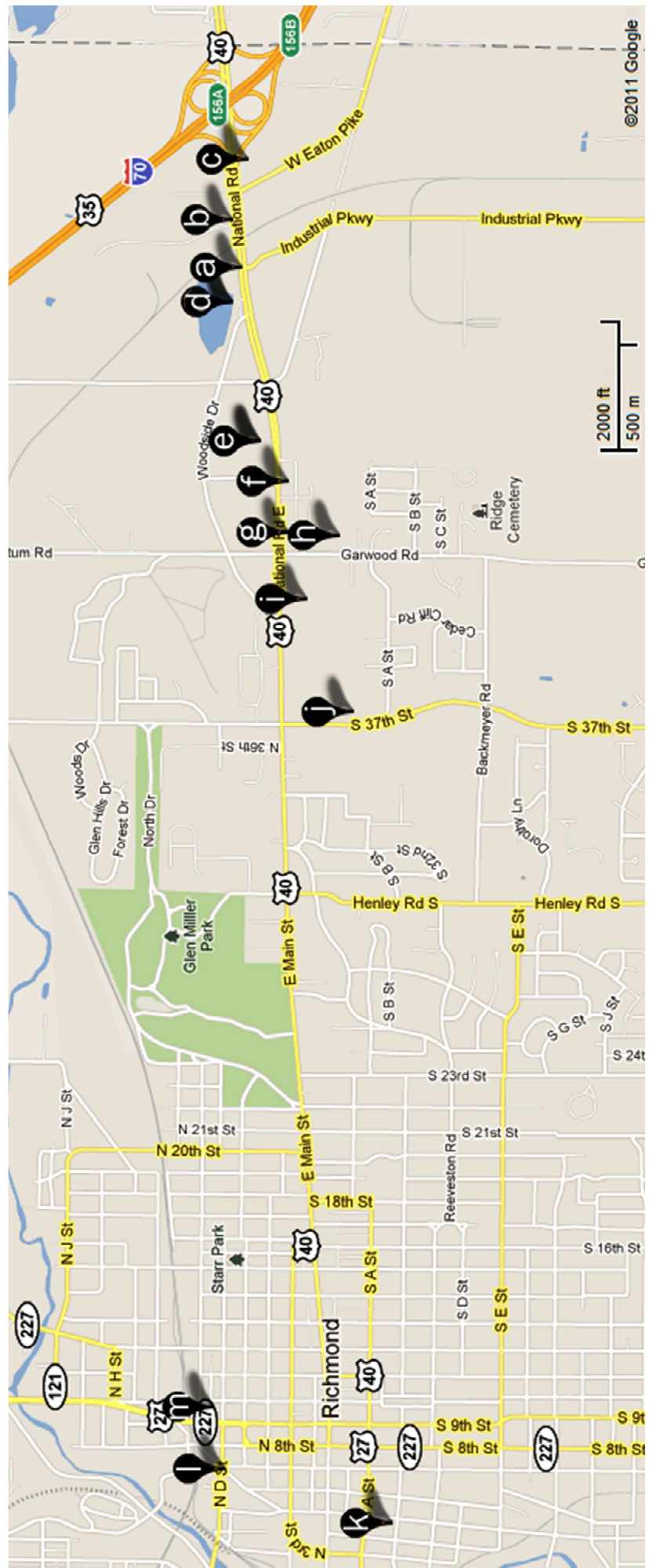
- 15** Chase Bank  
4400 East Main St.  
Richmond, IN 47374  
(765) 935-3803
- 16** Old National Bank  
3433 East Main St.  
Richmond, IN 47374  
(765) 935-8090

## Dayton International Airport

3600 Terminal Drive, Suite 300  
Vandalia, OH 45377  
(937) 454-8200

# Food + Drink Map

- a) Quality Inn and Conference Center (ASC Conference venue)
- b) Bob Evans Restaurant
- c) IHOP Restaurant
- d) Red Lobster
- e) Jade House Chinese Restaurant
- f) O'Charley's
- g) Applebee's Neighborhood Grill
- h) Galo's Italian Grill
- i) Chili's Grill and Bar
- j) Skyline Chili
- k) Olde Richmond Inn
- l) J & J Winery
- m) Ghyslain Chocolatier & Bistro





## Participants

The following pages contain the statements of interest with which participants have applied to participate in the conference. Conference participants can see each other's full biographical statements, and discuss each other's statements of interest and paper proposals after logging onto the conference website at:

**<http://www.asc-cybernetics.org/2011>**

The website will remain open after the conference.

# Mick Ashby

Email: [mick@rossashby.info](mailto:mick@rossashby.info)

Website: <http://www.rossashby.info>



I will bring to the conference two rather magnificent ears, curiosity, and an open mind.

Winner of the ASC's 2010 Cybernetics of Cybernetics Competition with the entry "Structure, Environment, Purpose, and a Grand Challenge for the ASC".

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# Philip Baron

Email: [pbaron@uj.ac.za](mailto:pbaron@uj.ac.za)

Website: <http://www.ecosystemic-psychology.org.za>



The topic of listening is of interest to me. Here are two spin offs which i am busy with and would love to explore/challenge in community with others:

1. Technology, the influence of technology on our communication. The experience of technology and the changes it brings in everyday life, including family life, religious life and psychology. For example, teenagers (and adults) and the use of mobile phones – should there be rehab for addicted phone users? Social media, Facebook etc. The love for technology and the time it takes away from other aspects of life like from family life and engaging with each other directly etc. Electronic devices (TVs, phones, PC etc) and the role they play in family life. The effects, the good the bad and the fancy. Where are we headed with technology becoming an end in itself? Let's talk about the future life and our life styles. Are we happy/sad with the way we/our children/society operate and rely on technology? Are we heading for a superficial time where no one experiences authentic face to face encounters anymore? Electronic communication.

The good stuff the bad stuff, the fun stuff. Are we spending too much time communicating with our electronics?

2. The levels of communication. Carl Roger's emotional feeling. Feeling where a person is at. Personal experiences including those not so easily explained, like intuitive feeling and knowing. Just like super sports men/women there are people who have excellent abilities in perceiving people. Let's discuss these abilities and maybe even try some of them. Maybe some magic will occur. On a serious note, profiling as a profession, how much is learned and how much of this is not – personal stories. One of the best profilers in South Africa talks of visiting the crime scenes and tuning in to the criminal. Many levels of listening. Personal experiences etc.

3. People are talking, emailing, texting, posting, tweeting, blogging – who is listening anymore?

4. Music appreciation.

5. Spiritual listening.

6. Dealing with blank faces, A student's revenge to lecturers/teachers.

My interests are relational psychology, engineering, music appreciation, problem solving, cybernetics, ecological thinking.

I have a diverse background in engineering, psychology, IT.



**Jacob Barton**  
Email: [udderbot@gmail.com](mailto:udderbot@gmail.com)  
Website: <http://jacobbarton.net>



I am interested in connecting my practice of microtonal music more explicitly to concepts of cybernetics. This is part of my broader interest in adding alternatives that add alternatives: finding needed language, inventing instruments, programming computers, coaching pedagogies. I could offer a session in microtonal listening (the literal kind of listening) including live performances. This could be connected to, but separate from, the performances being offered by the School for Designing a Society.

I'm also interested in having conversations involving temporary self-reference, paradoxical/contradictory descriptions, and building a repertoire desirable performances for everyday life.

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## Peter Bednar

Email: [peter.bednar@port.ac.uk](mailto:peter.bednar@port.ac.uk)

Conversations in an organizational setting frequently take place in a context of decision-making. Often, participants are engaged in a process intended to achieve some kind of consensus upon a course of action. The pressure often experienced within organizational life may often mean that participants are concerned to get across their own opinions and thus influence the outcome of a decision, with the result that they lack either the will or the possibility to pay sufficient attention to what other people are saying. My work and that of my collaborator have been concerned over many years to support effective dialogue between organisational actors so that they have space to explore both the similarities and the differences in their contextually-created views. What matters to each individual is not only impossible to judge externally but also irreducible to any common 'metric'. However, discussion of ideas is still valuable within a community whose interests overlap. Just as it would make no sense to ask for a consensus on whether people prefer oranges, bicycles or tropical fish, but a conversation with a group of people about their hobbies and interests is nevertheless worthwhile. We have highlighted a need to go beyond naive models for decision-making that emphasise some kind of bi-valued logic (true/false, yes/no) and support people to explore the full range of 'it depends' – i.e. listen to the whole variety of potential view points. Thus, a conference in which 'listening' is highlighted is particularly appealing to us. We hope, by listening to other delegates, to expand our understandings of ways in which effective dialogue can be supported. This can help us to reflect and expand upon the toolbox which is central to our approach. We also anticipate great fun in listening to like-minded people whose ideas are not constrained by conventional models for organizational discourse.

# Andrew Owen Brightman

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I have been actively pursuing my fascination with the practice of 'deep listening' for more than five years since I was first introduced to the concept and practice in a workshop by a colleague at the University of Illinois, Champaign-Urbana. Kirstie Simson, (Dance Faculty), directed our attention to the reality of a fully embodied experience of listening, which is in actuality a state of being in the world. Listening from the fully-embodied mind is becoming aware of the multi-sensory process that is occurring at all times for every person. However, this level of listening often goes unperceived until the attention is called to it. In further pursuit of this practice, I discovered Contemplative Dance/'Authentic Movement' (Mary Starks Whitehouse et al.), another embodied form that engages deep listening in the pursuit of expressing emerging awarenesses and subconscious knowing of the past and present, through 'active imagination' (C.G. Jung). During two years of training in this contemplative, intuitive, active, embodied practice, I have developed a further interest in how this practice of 'deep listening' can be applied to the detection of emergent properties of complex systems such as interpersonal relations, 'wicked' design problems, and the artistic creative process. It seems to me that ASC Conference will be an ideal venue to explore some of these ideas with others who might share similar interests and bring new concepts and experiences to the discussion. I am proposing both a performance and a workshop to have two levels of involvement. I hope to invite an initial reaction and response to 'deep listening' as displayed in practice through an improvised creative process by a performance group. And then, through a workshop, to engage a deeper dialogue with the more interested and intrigued after, and during, their own experience of the deep listening practice of Contemplative/Authentic Movement.

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# Pille Bunnell

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I am interested in coming to the conference for three reasons. First, and foremost, I like the people and their ideas, and I enjoy learning what they have been thinking about. I enjoy having a wide range of conversations with both old friends and newcomers. I did not make it to the ASC conference last summer, and I missed it. This brings me to the second point; I do feel a sense of connection, a loyalty I could say, to the organization, or perhaps more properly to the people who constitute the organization. Thus the two facets, pleasure for myself and a desire to contribute. Thirdly, I have not had an opportunity to experience a conference in the planned format, and am curious to experience it. I like good presentations very much. I enjoy the artform of ideas well thought through and presented so that others can see within hours what has taken months to develop. I like to hear and think, and then after thinking, have a one-to-one conversation.

What might I contribute? I have been thinking about the matter of "domains" over the last year. In particular I note how ephemeral these are, how easily we constitute and reconstitute them as we flow in our doings and conversations.

Yet we construct the logics that give credibility to what we say with rules that do not recognize the dynamics of how domains and distinctions arise and disperse. I detect many "domain errors" in how people make claims or arguments.

Yet in good conversations, we flow with this dynamic with comfort and ease. The phrase "listening for domain" has taken on a new depth of meaning for me.

# Leslie Burm

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Sonic environments are more and more perceived as annoyance, as noise, especially urban ones. As a consequence users of urban spaces isolate themselves on an auditory level. This may introduce an impoverishment of the perception of city spaces and the communication among its users. My research focuses on the exploration and introduction of creative actions to understand this phenomenon and to interact with it. These actions will not have their nature in a defensive approach – a more common approach in architecture and urbanism – but are looking to an acceptance of a sonic environment and the introduction of new sound stimuli. This approach – mixing, combining an existing or manipulated soundscape with a newly introduced sonic experience – wants to introduce a research by design of the construction of sound within existing soundscapes in order to generate knowledge for – and not about – the perception of sound in spaces. Or to put it in other words : ‘listening’ in all its dimensions.

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# Art Collings

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My interest in cybernetics lies on the mathematical side. As I have been slowly reading classics in the field, Shannon’s “noisy channel” concept seems obvious preparation for a Listening Conference. Regarding this theme, I bring the question whether Listening should be regarded as a good in itself, or rather a tactic. I know arguments for both positions. Certainly, I like to listen, especially to others who skillfully articulate difficult and intriguing ideas. And surely, the world will be better when people listen to each other more. But somehow I am wary about the urge to beatify the concept. Listening (obviously) is essential to the widest range of human acts. And, listening – physiologically – is a whole body process (not just ears) that evokes vast ranges of response. But listening is also the most treacherous of activities – in accord with it’s second definition (“to obey”). Listening becomes entrainment, surrender to influence, obedience.

Variety killing variety I suppose, but at some point I prefer argument, discord, and noise.

More than likely, though, if I speak to you at the conference, it will be about some completely different topic. One mathematical topic, that I may be inclined to speak about is the 4-value logic I have been working on for some time. After the loss of much hair, I finally proved the completeness theorem for this logic. The reason this logic is (may be) of interest is that it contains provable statements that can’t be established from the postulates/axioms/initials of regular propositional logic / boolean algebra. In other respects I am not aware of any direct application for this logic (such as to cybernetics), which makes it in some sense an abstraction.



# Laura Ehmann

Email: minniecreek@charter.net



I am a doctoral student in the Transformative Studies Program at the California Institute of Integral Studies. Cybernetic epistemology was introduced in my courses and I am in love with it. I am attending this conference because I continue to be curious. I want to see if and how conversing (last year's conference) finds its way to listening (this year's conference). And, as always, I want to have fun.

In my academic work, I am interested in using cybernetics as a framework for creating a form of online classroom experience that is a performed embodiment of the transformative subject matter it teaches: a circularly organized interaction between what is taught and how it is taught. I am particularly interested in the aesthetics of the online learning environment as it is embodied in using non-traditional academic communication such as images, video, audio, poetry, and absurd wordplay.

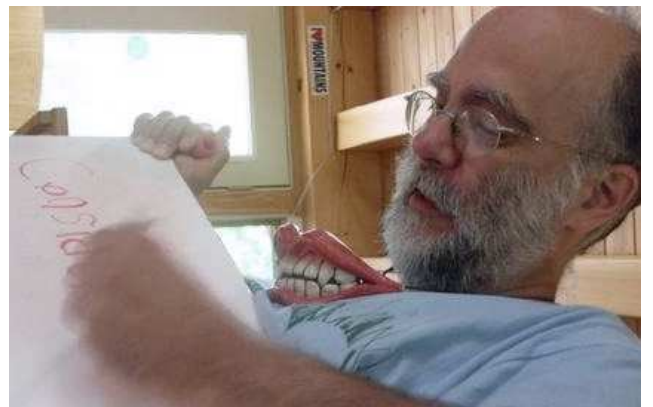
Cybernetic epistemology helps me recognize that I create the descriptions of my everyday world and when this happens I invite a shift to occur. I become more interested in looking at the ways I describe my everyday rather than in a particular category or set of descriptions of my everyday. I begin to notice that I am responsible for participating in what I bring forth as a description and the interactional effect on those around me who do not describe the world in circular or relational terms.

To quote Bradford Keeney, "To the extent that we enact the circularities of our relational presence in a way that fosters the greater circles that hold us, we may be said to be a part of a healing presence and a resourceful participant in the advance of the greater good."  
Now that's what I'm talkin' about!

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# Mark Enslin

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I'm interested in listening as a compositional project to address problems of "not being heard" and "not being listened to" that arise in the domains of the personal and the political. I bring several performances of music and theater as manifestations of this interest.

# Delfina Fantini

Email: [delfinafantini@gmail.com](mailto:delfinafantini@gmail.com)



I will bring my background.

I am concerned with future cities, I am interested in the intersection of the urban realm, human beings, and a ubiquitous technology.

I am looking to hear.

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# Lisa Fay

Email: [jeffglassman0@gmail.com](mailto:jeffglassman0@gmail.com)

Website: <http://lisafayandjeffglassmanduo.org>



# Thomas Fischer

Email: [Thomas.Fischer@xjtlu.edu.cn](mailto:Thomas.Fischer@xjtlu.edu.cn)



I regard listening as a means for personal enrichment and would like to participate in order to enrich myself with new ideas and views. I offer my ideas and views to other participants in return. Professionally, I am interested in the role listening plays in innovation and design. At this conference I will try to develop some specific ideas regarding listening in organizational hierarchies as outlines in my paper proposal.

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# Ranulph Glanville

Email: [ranulph@glanville.co.uk](mailto:ranulph@glanville.co.uk)



There is no conversation without listening: it is listening that converts a stream of sound into a conversation, an act of sharing. Listening is the pre-requisite that we can hope to understand others, an act of generosity and openness towards the other.

(When I talk of listening, I do not mean hearing: I mean that form of hearing that is attentive, seeking to “hear what is behind what is heard”, to understand. In visual terms, the parallel is seeing = hearing; looking= listening. I shall come to listen: to learn to listen better and to discover what listening better does for me and for those I am with.

# Jeff Glassman

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# Phillip Guddemi

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The 1968 Wenner-Gren conference that Mary Catherine Bateson chronicles in *Our Own Metaphor* has long been a touchstone for me. It linked the ecological crisis, which I was already aware of, to ways of thinking in a culture that were deep rooted. But when I came to study with Gregory Bateson as an undergraduate at U.C. Santa Cruz, he gently discouraged my interest in planning cultural change. A felt urgency for action did not excuse sloppy thinking, and most urgent thinking tended in his view to be sloppy for systemic reasons. Most solutions to short-term problems reinforced the larger context which produced the problems. In the ensuing forty-two years it has been sad to witness the continued reinforcement and even entrenchment of so many of the premises of thought and action that Bateson found problematic before his death in 1980.

I hope to bring to this conference any wisdom that I have gleaned from my diverse and restless studies. I also bring to the table a belief that deep listening is essential to understanding, a belief that is partly inspired by old school ethnography with its methodology of “deep hanging out.”

Creative thinking in new ways is unlikely to transform the larger culture, but it is perhaps the only thing that can. Encouraging listening and empathy will not always enable us to vanquish the people and ideas we consider our foes, but it is unlikely that we can solve our current human set of problems by force or by silencing other viewpoints in historically familiar ways.

I would like to see cybernetics bring us to new frontiers in humility, so that we recognize our own limitations and vulnerabilities and those of the people and environments around us, and so we can to some extent give up our dreams of control. In a paradoxical way I feel this describes an aspect of the vision of the elder Bateson, which brought about in him a kind of empathetic wisdom that if we also adopted it, might at least make the inevitable changes in our immediate futures more bearable.

# Bob Helland

Email: [bobhelland@gmail.com](mailto:bobhelland@gmail.com)



I was the Heinz von Foerster prize winner in “Cybernetics of Cybernetics” writing competition. At the conference, I will be looking for understanding and guidance. I expect to meet people who have once been where I now am and are able to pass on wisdom. I will be willing to listen.

Addendum: I will be arriving late Monday (8-Aug) and leaving the afternoon of Sunday (14-Aug). I re-arranged my trip departure date so as to be present for the discussion of “Cybernetics of Cybernetics” entries where I look forward to an open-air discussion of my submission “The ACRE Model”, a conceptual framework for disentangling our abstract human perceptions and conceptions from the near-objective, concrete, resource-laden world in which we exist.

In the interest of building new friendships and benefiting economically from sharing resources, I would like to extend an open invitation to anyone interested in sharing accommodations: I have booked a Quality Inn double-bed, smoking room (to be most inclusive, I do not intend to smoke but have no objections to those who would). My reservation is actually for 10-Aug (Wed) through 14-Aug (Sunday), due to my original trip plans. Anyone who wishes to discuss a shared opportunity is invited to send me an email to setup an arrangement. [BobHelland@gmail.com](mailto:BobHelland@gmail.com) – Thank you!

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# Michael Hohl

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Website: <http://www.hohlwelt.com/en>



What i am looking for: I want to learn about all the different ways of listening. Until now i mostly thought of listing in the sense of ‘mindfulness’, paying attention to the sounds that surround us. Last year i realised a new dimension: Making an effort to understand people. This is an active process. If we do not make an effort to understand, we will not understand.

My interests: Listening was a topic at the heart of my Phd research. I wish i could have spent more time on it. Admittedly the dimension of listening i was exploring in my thesis was more related to a John Cage’s or Stockhausen’s ways of ‘listening’, where we learn to become consciously aware of environmental sounds. Needless to say i also am interested in conversational ‘listening’ in which minds connect.

What i may contribute: Some thoughts on the role of listening (the conference’s listening) in the different stages of research.



# Aartje Hulstein

Email: [aartje@glanville.co.uk](mailto:aartje@glanville.co.uk)



I bring to the conference my ability to listen, not just with my ears, but with other senses too. I bring curiosity and interest in what other people do in their lives, an interesting practice and the ability to ask difficult questions.

Listening has been part of my life for as long as I can remember. From the 'listen, do as you are told' I have now arrived in a place where I am asked to speak, and I am listened to. I have also become much better at really listening to what others say, not just hear them. In my professional life I listened to learn the techniques to diagnose and to treat (often control) the outcome. I knew what had to be done.

Slowly I started to listen to what the 'patients' told me and explored with them what they thought might help. I had to learn to observe, to try, to reflect and to find new ways of observing and reflecting. I learned to trust my hands, to listen with them, rather than see, and reflect on what they did after the act and then connect it with what I knew. In the conference I hope to share and extend my listening skills, listening to the experience of other people and adding new experiences and reflection to my way of working. I very much enjoyed the form the conference took last year and I am looking forward to create a new form with other participants

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# Tim Jachna

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Each of us is responsible for our own listening, but in our various roles, we also find ourselves responsible for establishing the conditions for specific economies of speaking-and-listening involving others, besides oneself. In each of my professional roles (designer, planner, team leader, educator, administrator...) I am expected to be a different kind of listener. In each of these roles I am also expected to establish and sustain situations in which listening in certain ways by certain participants is facilitated, encouraged and even (ostensibly) enforced! I see benevolent and nefarious dimensions to this, in theory as well as from my personal experience. I hope to use the context of the conference to discuss appropriate positions and approaches to fulfilling such roles.

Taking the theme of this conference as an occasion to think about the role of listening in the practice of design, I have the impression – which I would like to discuss and articulate further in the conference – that new paradigms or approaches in design arise with a commitment to listen intently to something that has not previously been given focused attention – to give a focused hearing to an aspect that conventional design approaches of the time may consider to be minor voices, supporting views, irrelevant distractions, peripheral chatter or background noise.

Functionalist, rationalist, neo-historicist, "green"/sustainable, deconstructivist, post-modern, and participatory approaches to design (just to name some examples) all arose not from new ideas as to how to answer the questions designers were dealing with, but rather from new ideas as to how to listen, and what to listen to, in defining the questions that design should address.

I will come to the conference with my curiosity, experiences and thoughts about these two themes, and I expect that many other themes will emerge in the course of my participation and my listening.

# Mark Johnson

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Website: <http://dailyimprovisation.blogspot.com>



I guess we don't usually go to conferences to listen! I may have honourable and good intentions about listening at this one – although I'm not sure I'll manage it. But then I'm interested in why I (and most of the people I know) find it difficult. Some key questions occur to me:

....is listening difficult because it is organisationally difficult within my personhood?

...if so, is there a way of characterising the organisation of personhood which identifies the challenge of listening?

...and with such a characterisation, how might we have better control over ourselves to listen better?

...and finally, what does a world of 'better listening' look like? And do we want to live in it?

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# Faisal Kadri

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Website: <http://artificialpsychology.com>

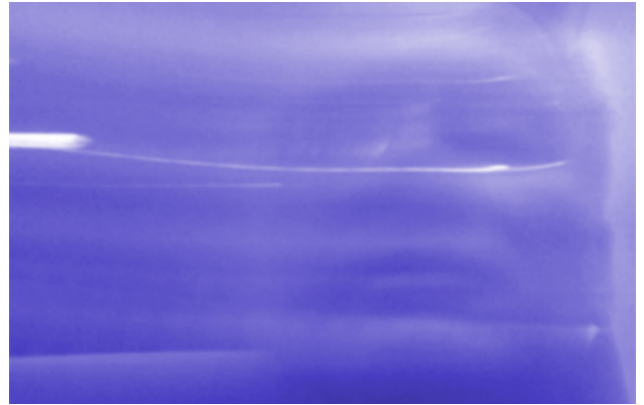


The topic of listening is of interest to me. Here are two spin offs which i am busy with and would love to The contribution is a re-examination of Ross-Ashby's Homeostat and how the suggested mechanism of multiplier feedback works and complements the Homeostat. The multiplier feedback explains adaption and stability phenomena without the need for a set point. Hysteresis and animal behavioral homeostasis are examples of multiplier feedback phenomena.

This is basic nuts-and-bolts cybernetics. It would take too long to develop the basic ideas in order to show the connection with the listening theme of the conference.

# Ted Krueger

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Perhaps the principle value of listening is to encounter that which you don't already understand. That is my hope for the conference. In this it is important not to listen only to the message of others, but also to what supports its saying, to what surrounds the saying, and to what remains unsaid.

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## Supriya Kummamuru

Email: [Supriya.Kummamuru@tcs.com](mailto:Supriya.Kummamuru@tcs.com)



Listening if perceived form cybernetics concepts would have the feedback and learning built in as opposed to just hearing. My interest stems from my area of research which is application of Stafford Beers , Viable Systems Model built on Cybernetics principles to Organization design. The research questions I would like to raise is do organizations listen to the needs of the employees , are there channels designed to listen and built appropriate systems to address them.

My purpose in attending this conference is to see if there are any models which would share similar concepts which would help in validating my ideas or imbibing new ideas for my ideas. I am particularly looking at the knowledge intensive industry like software services, where the human variety needs are more than the machine variety. Broadly, Systems Thinking can help in designing organization structures and Cybernetics can help in designing organizational processes. All these should be integrated through a sound philosophical approach, which emphasizes deep and systematic understanding of the complexity underlying the organizational processes without the temptation to offer oversimplified check lists and heuristics, which invariably fail to take into account the complex dynamics of organization/environment and their interaction. This is basically my interest.



# Allenna Leonard

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Long term interest in the application of cybernetics to governance and social affairs. Looking for conversations and the insights that emerge.

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# Hugo Letiche

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Listening is easily equated with something good; but sound (white noise) can be life threatening and listening can be a very dangerous and violent. Michel Serres especially has developed a theory of white noise as a social political source of doubt. I hope to explore the dark side of listening.

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# Philip Lewin

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In a simple-minded kind of way, I have long believed that the central moral issue of our time concerns noticing — and the failure to notice — what one is actually doing, what the consequences of one's actions are. The worst instances of evil, it seems to me, result from the failure to notice, from the self-willed moral blindness that rigid adherence to any ideology, whether secular or sacred, affords. Cybernetically speaking, the failure to notice is a failure at the most elementary level of recursive interaction.

What I look forward to at this conference is to begin from the perspective of the other and in so doing, to create space to notice.

# Jude Lombardi

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From past life at SU

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# Chris Mann

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Website: <http://www.theuse.info>



i'd like to offer a performance which has developed out of various strategies for privileging the audience (two speakers reading the same text with mics and headphones arranged that voice A can hear voice B in the headphones and vice versa, but so loud that she cant hear herself; three speakers with mics and headphones arranged that A can hear B in the left, C in the right ear, again so loud that she cant hear herself; realtime phoneme recognition and spatialisation over 16 channels so that T always sounds in speaker 3, O in speaker 8, S in 11, etcet; a speaker lozenge that employs bone resonance ..). all of my work has been to do with speech (language is when you correct the grammar of your oppressor, ..) and examples can be found at [www.theuse.info](http://www.theuse.info). the piece i'd like to offer is a continuation of work on overhearing and various strategies to distinguish listening to from listening for. formally its probably not too dissimilar to various other performances i've done at meetings of the asc over the years.

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# Robert J. Martin

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As a musician and composer I am interested in listening to all sound, organized and unorganized. As a teacher and psychotherapist I am interested in listening to others as the way we learn what others have taken our words to mean. As a human being I am interested in how others, especially those from different cultures understand the world in which they live. My listening (and seeing and reading) is an opportunity to expand my universe by learning about theirs. The ASC conference is an opportunity to do this. In particular I appreciate the opportunity to engage in listening and interacting with an international group. The ASC conference is the one time each year when I have the opportunity to talk and listen with others about constructivist and second-order cybernetic thinking.

# Elizabeth McGregor

Email: [mcgree@gmail.com](mailto:mcgree@gmail.com)



I really enjoyed C:ADM last year and found it to be of great benefit to me in terms of motivation and finding new perspectives for my research. I think that this would be another wonderful experience. I also feel that I will be able to make greater contributions to the discussions of this conference as the ideas are directly relevant to my research in how people learn through different mediums. I would greatly appreciate the opportunity to share my knowledge from research with others of different perspectives and I feel that it would be mutually beneficial.

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# Johann van der Merwe

Email: [vandermerwejj@cput.ac.za](mailto:vandermerwejj@cput.ac.za)



What do I bring to this conference: The result of my doctoral research is a theory-of-knowing called gramma/topology, which utilises cybernetics and systemic thinking, actor-network theory, autopoiesis and ontological phenomenology. As a committed radical constructivist I am convinced that this theory-of-knowing works, for me, but I cannot prove this to anyone else, except through a cybernetic conversation, and even then all that is possible is not solid proof, but a taking on board of another point of view that could lead to a change of mindset. None of this is possible without a 'letting go', a way of opening up to 'the other' in such a way that the listener can, effectively, uncover and 'see' something new, without an 'own knowledge' getting in the way. That is the art of listening, for, as Maturana and Varela (1987:196) stated, "each person says what he says or hears what he hears according to his own structural determination; saying does not ensure listening". Every person's structural determination has to be changed, redesigned, in the very act of listening, through one framing action, as it were.

As for my interests and what I am looking for, simply this: I would welcome the opportunity to robustly discuss and argue my work, and in the process share something that I believe in, because it is in the acceptance of my communication (transformed by the receiver/'listener') that I can first begin to perceive what gramma/topology might mean, and when this transformed information is fed back to me in an ongoing conversation, it is as if I am listening to my new knowing self for the first time.

# Pauline Oliveros

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Website: <http://paulineoliveros.us>



I am the founder of Deep Listening – a practice that I have been teaching for more than 30 years. I will be interested in what others have to say about how they listen.

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# Paul Pangaro

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i prefer a focus on conversation above a focus on listening. of course, listening is needed. and so is conversation. call it a predeliction

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# Sylvia Rabeler

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In Webster's English dictionary, every definition of the word "listening" includes a reference sound; however, one subtext defines listening as "to give consideration (~ to a plea)" or to pay attention. Defining listening as such, we can use the term listening as a means of observation. From this perspective we can listen to thoughts and concepts, things that exist in our mind, things that do not have an association with sound. In my theoretical systems research, I use an art-based methodology to optimize my spatial reasoning skills, and heighten my ability to see alternative solutions to problems of logic. I refer to this method as Cybernetic Scrying. This involves a employing a self-directed feedback loop between mind and environment, essentially listening to the rational calculations of my mind for information on how to proceed with the construction of a visual composition, via iterative applications of paint on a canvas. Each application of paint changes my perspective on the problem that I am working on, necessitating a new round of listening. The more

I listen, the more I sharpen my awareness. This is a form of mental exercise. Practice improves performance. In attending the ASC Conference on Listening, I would like to share my ideas regarding this method with others and to develop a paper that outlines a theoretical foundation for the use of the scrying algorithm. Most importantly, I am interested in what others have to say about listening and how they integrate listening in their work.



# Larry Richards

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I would like to be a participant-listener in the conversational sessions of the main conference, and to attend and participate in pre- and post-conference events/activities as well. I think that listening in all its forms is a critical concept in the design of a participative-dialogic society, and a concept that deserves further exploration and development. The speaker-respondent circularity requires listening to turn the circularity into a conversation. Participants must set ego aside, and explore new ways to be present. In particular, I claim that an alternative approach to the uniquely human attribute called consciousness is needed, a shift from one characterized by purposiveness to one focused on presence. I look forward to the exploration.

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# Daniel Rosenberg

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Daniel is interested in how second-order cybernetics has explained the structural coupling between humans and their environments, and the implications it has for design and the use of technology. His vision is to use technology as a means of enhancing human experience rather than addressing technology as an end by itself. Design, in this context, refers to the definition of a particular condition that may cause certain experiences to emerge. Daniel harnesses this vision through constructing technological experiments on human-environment interaction, aiming at unveiling ways of creating memorable, transformative yet natural and effortless experiences in the world.

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# Elizabeth Simpson

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In seeking to support individuals and groups in identifying and accomplishing their aspirations (in light of the social and ecological world), I am always seeking to increase my listening skills as well as my ability to engender them in others. Part of listening is noticing what isn't heard- underrepresented or absent voices or experiences- as well as the the not yet identified possibilities the constellations of our interactions create. At this conference I am especially interested in finding the 'lower volume' ideas and people present (or absent).

# Stuart Umpleby

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I am interested in defining cybernetics as a science underlying the social sciences and design disciplines (e.g., architecture and policy studies). Whereas physics is a science of matter and energy, the subject matter of cybernetics is information and regulation. In an industrial society theories could perhaps be reasonably thought of as existing outside the system observed. However, in an information society theories have become obvious elements of a social system.

Presently the most prominent case is economics. In economics there is renewed interest in the history of economic thought. Prior to the economic crisis of 2008 economic thought was often described as a progression from imprecise thinking to mathematical analysis, as a movement toward free market capitalism with erroneous experiments being tried by various countries. Following the financial crisis and a renewed interest in government regulation of markets, there has been a return to Keynes's ideas about the appropriate role of government in the economy. This return to earlier ideas has led to a description of economic theories as fundamental parts of the behavior of an economy. For example, there is an oscillation between a theory that markets will solve all problems and a theory that markets are unstable and government regulation is needed. A theory that encompasses previous theories and describes their effects on an economy could be called "second order economics." The financial crisis has led to a reconsideration of the importance of the history of economic thought. Acceptance of a reflexive view of economics, and other social science disciplines, has been impeded by a concern that self-referential statements lead to logical inconsistencies. Second order cybernetics, by interpreting self-reference as occurring in time, can serve as a guide to the social sciences on how to include reflexive phenomena in their theories.

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# Christine Welch

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Conversations in an organizational setting frequently take place in a context of decision-making. Often, participants are engaged in a process intended to achieve some kind of consensus upon a course of action. The pressure often experienced within organizational life may often mean that participants are concerned to get across their own opinions and thus influence the outcome of a decision, with the result that they lack either the will or the possibility to pay sufficient attention to what other people are saying. My work and that of my collaborator have been concerned over many years to support effective dialogue between organisational actors so that they have space to explore both the similarities and the differences in their contextually-created views. What matters to each individual is not only impossible to judge externally but also irreducible to any common 'metric'. However, discussion of ideas is still valuable within a community whose interests overlap. Just as it would make no sense to ask for a consensus on whether people prefer oranges, bicycles or tropical fish, but a conversation with a group of people about their hobbies and interests is nevertheless worthwhile. We have highlighted a need to go beyond naive models for decision-making that emphasise some kind of bi-valued logic (true/false, yes/no) and support people to explore the full range of 'it depends' – i.e. listen to the whole variety of potential view points. Thus, a conference in which 'listening' is highlighted is particularly appealing to us. We hope, by listening to other delegates, to expand our understandings of ways in which effective dialogue can be supported. This can help us to reflect and expand upon the toolbox which is central to our approach. We also anticipate great fun in listening to like-minded people whose ideas are not constrained by conventional models for organizational discourse.

# Randall Whitaker

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Listening has been a very important part of my life. Careful listening helps explain why I wasn't diagnosed as legally blind until age 9. I've employed listening skills of various types in such roles as (e.g.) professional musician, volunteer counselor, Social Security claims interviewer, knowledge acquisition specialist, participatory design participant, and systems analyst. In these and other contexts my lifelong propensity for listening was applied to 'listening with intent' (i.e., listening in the service of some purpose).

It is my observation that listening has become something of a lost art in a modern American society that prioritizes trappings such as visual glitz and personal projection over substance and understanding. I'm interested in hearing what others think of listening, how they employ it, and how this critical human capacity might be constructively returned to its proper prominence.

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# Jennifer Wilby

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I am interested in coming to listen to other participants. I have done enough talking in the past few weeks and would now like to sit and think and absorb from others. I would also like to learn more about cybernetics and what it means to my own research and wanderings.

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# Ya'aqov Ziso

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I have composed music for ASC conferences in the past, attended several conferences, workshops and classes engaging cybernetics offered by the School of Designing a Society. As the project of creative digital repositories for the SDaS unfolds, the project team, which I coordinate, observes the dynamics of organizing our endeavor as we keenly listen and plan our conversations.



## Post-Conference Study (14-15 August)

The post-conference study celebrates and remembers two important former members: the centenary of Heinz von Förster (who founded the ASC) and the life and work of Ernst von Glasersfeld by studying the following papers with others who share our curiosity about their work.

### **Heinz von Förster (Primary)**

Responsibilities of Competence  
Perception of the Future and the Future of Perception

### **Heinz von Förster (Extra)**

Disorder/Order: Discovery or Invention?  
Doomsday: Friday, 13 November, A.D. 2026

### **Ernst von Glasersfeld (Primary)**

The Incommensurability of Scientific and Poetic Knowledge  
The Conceptual Construction of Time

### **Ernst von Glasersfeld (Extra)**

Farewell to Objectivity  
Feedback, Induction, and Epistemology

The following pages contain two introductory texts to the cybernetics of Heinz von Förster and Ernst von Glasersfeld:

### **Heinz von Förster**

Cybernetics of Cybernetics (short) paper

### **Ernst von Glasersfeld:**

Declaration of the ASC



# Cybernetics of Cybernetics

HEINZ VON FOERSTER  
*University of Illinois, Urbana*

1979

Ladies and gentlemen—As you may remember, I opened my remarks at earlier conferences of our Society with theorems which, owing to the generosity of Stafford Beer, have been called “Heinz von Foerster’s Theorem Number One and Number Two”. This all is now history.<sup>12</sup> However, building on a tradition of two instances, you may rightly expect me to open my remarks today again with a theorem. Indeed I shall do so but it will not bear my name. It can be traced back to Humberto Maturana,<sup>3</sup> the Chilean neurophysiologist, who a few years ago, fascinated us with his presentation on “autopoiesis”, the organization of living things.

Here is Maturana’s proposition, which I shall now baptize “Humberto Maturana’s Theorem Number One”:

*“Anything said is said by an observer.”*

Should you at first glance be unable to sense the profundity that hides behind the simplicity of this proposition let me remind you of West Churchman’s admonition of this afternoon: “You will be surprised how much can be said by a tautology”. This, of course, he said in utter defiance of the logician’s claim that a tautology says nothing.

I would like to add to Maturana’s Theorem a corollary which, in a modesty, I shall call “Heinz von Foerster’s Corollary Number One”:

*“Anything said is said to an observer.”*

With these two propositions a nontrivial connection between three concepts has been established. First, that of an *observer* who is characterized by being able to make descriptions. This is because of Theorem 1. Of course what an observer says is a description. The second concept is that of *language*. Theorem 1 and Corollary 1 connect two observers through language. But, in turn, by this connection we have established the third concept I wish to consider this evening, namely that of *society*: the two observers constitute the elementary nucleus for a society. Let me repeat the three concepts that are in a triadic fashion connected to each other. They are: first, the observers; second, the language they use; and third, the society they form by the use of their language. This interrelationship can be compared, perhaps, with the interrelationship between the chicken, and the egg, and the rooster. You cannot say who was first and you cannot say who was last. You need all three in order to have all three. In order to appreciate what I am going to say it might be advantageous to keep this closed triadic relation in mind.

I have no doubts that you share with me the conviction that the central problems of today are societal. On the other hand, the gigantic problem-solving conceptual apparatus that evolved in our Western culture is counterproductive not only for solving but essentially for perceiving social problems. One root for our cognitive blind spot that disables us to perceive social problems is the traditional explanatory paradigm which rests on two operations: One is *causation*, the other one *deduction*. It is interesting to note that something that cannot be explained—that is, for which we cannot show a cause or for which we do not have a reason—we do not wish to see. In other words, something that cannot be explained cannot be seen. This is driven home again and again by Don Juan, a Yaqui Indian, Carlos Castaneda’s mentor.<sup>4</sup>

It is quite clear that in his teaching efforts Don Juan wants to make a cognitive blind spot in Castaneda’s vision to be filled with new perceptions; he wants to make him “see”. This is doubly difficult, because of Castaneda’s dismissal

of experiences as “illusions” for which he has no explanations on, the one hand, and because of a peculiar property of the logical structure of the phenomenon “blind spot” on the other hand; and this is that we do not perceive our blind spot by, for instance, seeing a black spot close to the center of our visual field: we do not see that we have a blind spot. In other words, we do not see that we do not see. This I will call a second order deficiency, and the only way to overcome such deficiencies is with therapies of second order.

The popularity of Carlos Castaneda’s books suggest to me that his points are being understood: new paradigms emerge. I’m using the term “paradigm” in the sense of Thomas Kuhn<sup>5</sup> who wants to indicate with this term a culture specific, or language specific, stereotype or model for linking descriptions semantically. As you may remember, Thomas Kuhn argues that there is a major change in paradigms when the one in vogue begins to fail, shows inconsistencies or contradictions. I however argue that I can name at least two instances in which not the emergent defectiveness of the dominant paradigm but its very flawlessness is the cause for its rejection. One of these instances was Copernicus’ novel vision of a heliocentric planetary system which he perceived at a time when the Ptolemaic geocentric system was at its height as to accuracy of its predictions. The other instance, I submit, is being brought about today by some of us who cannot—by their life—pursue any longer the flawless, but sterile path that explores the properties seen to reside within objects, and turn around to explore their very properties seen now to reside within the observer of these objects. Consider, for instance, “obscurity”. There is at aperiodic intervals a ritual performed by the supreme judges of this land in which they attempt to establish once and for all a list of all the properties that define an obscene object or act. Since obscenity is not a property residing within things (for if we show Mr. X a painting and he calls it obscene, we know a lot about Mr. X but very little about the painting), when our lawmakers will finally come up with their imaginary list we shall know a lot about them but their laws will be dangerous nonsense.

With this I come now to the other root for our cognitive blind spot and this is a peculiar delusion within our Western tradition, namely, “objectivity”:

“The properties of the observer shall not enter the description of his observations.”

But I ask, how would it be possible to make a description in the first place if not the observer were to have properties that allows for a description to be made? Hence, I submit in all modesty, the claim for objectivity is non sense! One might be tempted to negate “objectivity” and stipulate now “subjectivity”. But, ladies and gentlemen, please remember that if a nonsensical proposition is negated, the result is again a nonsensical proposition. However, the nonsensicality of these propositions either in the affirmative or in their negation cannot be seen in the conceptual framework in which these propositions have been uttered. If this is the state of affairs, what can be done? We have to ask a new question:

“What are the properties of an observer?”

Let me at once draw your attention to the peculiar logic underlying this question. For whatever properties we may come up with it is we, you and I, who have to make this observation, that is, we have to observe our own observing, and ultimately account for our own accounting. Is this not opening the door for the logical mischief of propositions that refer to themselves (“I am a liar”) that have been so successfully excluded by Russell’s Theory of Types not to bother us ever again? Yes and No!

It is most gratifying for me to report to you that the essential conceptual pillars for a theory of the observer have been worked out. The one is a calculus of infinite recursions;<sup>6</sup> the other one is a calculus of self-reference.<sup>7</sup> With these calculi we are now able to enter rigorously a conceptual framework which deals with *observing* and not only with the observed.

Earlier I proposed that a therapy of the second order has to be invented in order to deal with dysfunctions of the second order. I submit that the cybernetics of observed systems we may consider to be first-order cybernetics; while second-order cybernetics is the cybernetics of observing systems. This is in agreement with another formulation that has been given by Gordon Pask.<sup>8</sup> He, too, distinguishes two orders of analysis. The one in which the observer enters the system by stipulating the *system’s* purpose. We may call this a “first-order stipulation”. In a “second-order stipulation” the observer enters the system by stipulating *his own* purpose.

From this it appears to be clear that social cybernetics must be a second order cybernetics—a *cybernetics of cybernetics*—in order that the observer who enters the system shall be allowed to stipulate his own purpose: he is autonomous. If we fail to do so somebody else will determine a purpose for us. Moreover, if we fail to do so, we shall provide the excuses for those who want to transfer the responsibility for their own actions to somebody else: “I am not responsible for my actions; I just obey orders.” Finally, if we fail to recognize autonomy of each, we may turn into a society that attempts to honor commitments and forgets about its responsibilities.

I am most grateful to the organizers and the speakers of this conference who permitted me to see cybernetics in the context of social responsibility. I move to give them a strong hand. Thank you very much.

## Notes

<sup>1</sup>Beer, S., *Platform for Change*: 327, New York: Wiley, 1975.

<sup>2</sup>Weston, P.E. and von Foerster, H., “Artificial intelligence and machines that understand”, in Eyring, H., Christensen, C. H., and Johnston, H. S. (Eds.), *Annual Review of Physical Chemistry*, 24: 358–378, Palo Alto: Annual Review Inc., 1973.

<sup>3</sup>Maturana, H., “Neurophysiology of cognition”, in Garvin, R (Ed.), *Cognition, A Multiple View*: 3–23, New York: Spartan Books, 1970.

<sup>4</sup>Castaneda, C., *The Teachings of Don Juan: A Yaqui Way of Knowledge*, New York: Ballantine, 1969.

Castaneda, C., *A Separate Reality*, New York: Simon and Schuster, 1971.

Castaneda, C., *Journey to Ixtlan*, New York: Simon and Schuster, 1972.

Castaneda, C., *Tales of Power*, New York: Simon and Schuster, 1974.

<sup>5</sup>Kuhn, T., *The Structure of Scientific Revolution*, Chicago: University of Chicago Press, 1962.

<sup>6</sup>Note #2.

<sup>7</sup>Varela, E, “A calculus for self-reference”, *International Journal of General Systems*, 2, No. 1: 1–25, 1975.

<sup>8</sup>Pask, G., “The meaning of cybernetics in the behavioral sciences (the cybernetics of behavior and cognition: extending the meaning of ‘goal’)” in Rose, J. (Ed.), *Progress in Cybernetics*, Vol. 1: 15–44, New York: Gordon and Breach, 1969.

## **Declaration of the American Society for Cybernetics**

Cybernetics is a way of thinking, not a collection of facts. Thinking involves concepts: forming them and relating them to each other. Some of the concepts that characterize cybernetics have been about for a long time, implicitly or explicitly. Self-regulation and control, autonomy and communication, for example, are certainly not new in ordinary language, but they did not figure as central terms in any science.

Self-regulation was ingeniously implemented in water clocks and self-feeding oil lamps several hundred years B.C. In the scientific study of living organisms, however, the concept was not introduced until the 19th century and the work of Claude Bernard. It has a long way to go yet, for in psychology, the dogma of a passive organism that is wholly determined by its environment, or by its genes, is still frequently accepted without question.

It is much the same with the concept of autonomy. Potentates and politicians have been using it ever since the days of Sparta; but the structural and functional balance that creates organismic autonomy has only recently begun to be studied (e.g. Maturana & Varela, 1980). And there is another side to the concept of autonomy: the need to manage with what is available. That this principle governs the construction of human knowledge, and therefore lies at the root of all epistemology, was first suggested at the beginning of the 18th century by Vico and then forcefully argued by Kant (see Chapter II). The implications of that principle are only today being pursued in some of the sciences.

As for communication, its case is perhaps the most extreme. We are told that the serpent communicated with Adam and Eve shortly after they had been created. Moses communicated with God. And ordinary people have been communicating with one another all along. However, a *theory* of communication was born a mere 40 years ago, when cybernetics began (Wiener, 1948; Shannon, 1948). It was, however, still an observers theory and said nothing about the requisite history of social interactions from which alone the communicators meaning could spring. Cybernetics arose when the notions of self-regulation, autonomy, and hierarchies of organization and functioning inside organisms were analyzed theoretically, that is, logically, mathematically, and conceptually. The results of these analyses have turned out to be applicable in more than one branch of science.

Cybernetics, thus, is metadisciplinary, which is different from interdisciplinary, in that it distills and clarifies notions and conceptual patterns that open new pathways of understanding in a great many areas of experience.

The investigation of self-regulation, autonomy, and hierarchical arrangements led to the crystallization of concepts such as circular causality, feedback, equilibrium, adaptation, control, and, most important perhaps, the concepts of function, system, and model. Most of these terms are popular, some have become fashion words, and they crop up in many contexts. But let there be no mistake about it: the mere use of one or two or even all of them must not be taken as evidence of cybernetical thinking. What constitutes cybernetics is the systematic interrelation of the concepts that have been shaped and associated with these terms in an interdisciplinary analysis which, today, is by no means finished.

Whenever something is characterized by the particular interrelation of several elements, it is difficult to describe. Language is necessarily linear. Interrelated complexes are not. Each of the scientists who have initiated, shaped, and nourished this new way of thinking would describe cybernetics differently, and each has defined it on a personal level. Yet they are all profoundly aware that their efforts, their methods, and their goals have led them beyond the bounds of the traditional disciplines in which they started, and that, nevertheless, there is far more overlap in their thinking than individual divergence. It was Norbert Wiener (1948), a mathematician, engineer, and social philosopher, who adopted the word "cybernetics". Ampère, long before, had suggested it for the science of government, because it derives from the Greek word for steersman. Wiener, instead, defined cybernetics as the science of *control and communication in the animal and the machine*. For Warren McCulloch, a neuroanatomist, logician, and philosopher, cybernetics was experimental epistemology concerned with the generation of knowledge through communication within an observer and between observer and environment. Stafford Beer, industrial analyst and management consultant, defined cybernetics as the science of effective organization. The anthropologist Gregory Bateson stressed that whereas science had previously dealt with matter and energy, the new science of cybernetics focuses on form and patterns. For the educational theorist Gordon Pask, cybernetics is the art of manipulating defensible metaphors, showing how they may be constructed and what can be inferred as a result of their construction. And we may add that Jean Piaget, late in his life, came to see cybernetics as the endeavor to model the processes of cognitive adaptation in the human mind.

Two major orientations have lived side by side in cybernetics from the beginning. One is concerned with the conception and design of technological developments based on mechanisms of self-regulation by means of feedback and circular causality. Among its results are industrial robots, automatic pilots, all sorts of other automata, and of course computers. Computers, in turn, have led to the development of functional models of more or less intelligent processes. This has created the field of artificial intelligence, a field that today comprises not only systematic studies in problem solving, theorem proving, number theory, and other areas of logic and mathematics, but also sophisticated models of inferential processes, semantic networks, and skills such as chess playing and the interpretation of natural language.

Other results of this essentially practical orientation have been attained in management theory and political science. In both these disciplines cybernetics has elaborated principles that clarify and systematize the relations between the controller and the controlled, the government and the governed, so that today there is a basis of well-defined theories of regulation and control (Ashby, 1952; Conant, 1981; Powers, 1973).

The other orientation has focused on the general human question concerning knowledge and, placing it within the conceptual framework of self-organization, has produced, on the one hand, a comprehensive biology of cognition in living organisms (Maturana & Varela) and, on the other, a theory of knowledge construction that successfully avoids both the absurdities of solipsism and the fatal contradictions of realism (von Foerster, McCulloch, von Glasersfeld).

Any attempt to know how we come to know is obviously self-referential. In traditional philosophy and logic, crude manifestations of self-reference have always been considered to be an anomaly, a paradox, or simply a breach of good form. Yet, in some areas, processes in which a state reproduces itself have been domesticated and formally encapsulated; and they have proven extremely useful (e.g., eigenvalues in recursive function theory, certain topological models derived from Poincaré, condensation rules in logic, and certain options in programming languages for computers, especially for application to non-numeric computations such as in knowledge engineering and expert systems). The formal management of self-reference was dramatically advanced by Spencer Brown's calculus of indications (1969), in which the act of distinguishing is seen as the foundation of all kinds of relationships that can be described, including the relationships of formal logic. Recent studies, building on that foundation and extending into various branches of mathematics, have thrown a new light on the phenomenon of self-reference (Varela, Goguen, Kauffman).

The epistemological implications of self-reference have an even wider range of influence in the cybernetical approach to the philosophy of science. Here there is a direct conflict with a tenet of the traditional scientific dogma, namely the belief that scientific descriptions and explanations should, and indeed can, approximate the structure of an objective reality, a reality supposed to exist as such, irrespective of any observer. Cybernetics, given its fundamental notions of self-regulation, autonomy, and the informationally closed character of cognitive organisms, encourages an alternative view. According to this view, reality is an interactive conception because observer and observed are a mutually dependent couple. Objectivity in the traditional sense, as Heinz von Foerster has remarked, is the cognitive version of the physiological blind spot: we do not see what we do not see. Objectivity is a subject's delusion that observing can be done without him. Invoking objectivity is abrogating responsibility, hence its popularity.

Observer-observed problems have surfaced in the social sciences with the emergence of the notion of understanding. In anthropology, for example, it has been realized that it is a sterile undertaking to analyze the structure of a foreign culture, unless a serious effort is made to understand that culture in terms of the conceptual structures that have created it. Similarly, in the study of foreign or historical literature, the hermeneutic approach has been gaining ground. Here, again, the aim is to reconstruct meaning in terms of the concepts and the conceptual climate at the time

and the place of the author. The emerging attitude in these disciplines, though traditionalists may be reluctant to call it scientific, is in accord with cybernetical thinking.

The most powerful and encouraging corroboration of the cybernetician's disengagement from the dogma of objectivity, however, comes from the hardest of the sciences. In physics, the problem of the observer reared its head early in this century. The theories of relativity and quantum mechanics almost immediately raised the question of whether they actually pertained to an objective reality or, rather, to a world determined by observation. For some time the question was not answered definitively. Einstein was hoping that the realist interpretation would eventually lead to a homogeneous view of the universe. Heisenberg and Bohr tended the other way. The most recent in the long series of particle experiments have lessened the chances of realism. Realism in this context was the belief that particles, before anyone observes them, are what they are observed to be. Physics, of course, is not at an end. New models may be conceived, and the notion of an objective, observer-independent reality may once more come to the fore. But at present, the physicist's theories and experiments confirm the cybernetician's view that knowledge must not be taken to be a picture of objective reality but rather as a particular way of organizing experience.

In the few decades since its inception, cybernetics has revolutionized large areas of engineering and technology. Self-regulation has moved from the refrigerator into the cars we drive and the planes we fly in. It has made possible the launching of satellites and "Explorers" of our solar system. It has also saddled us with target-seeking missiles, and it has brought about the computer age with its glories and its dangers.

For many of us, however, this explosion of gadgetry is not the most significant feature. The wheel, the harnessing of electricity, the invention of antiseptics and the printing press have all had somewhat similar effects on the mechanics of living. Cybernetics has a far more fundamental potential. Its concepts of self-regulation, autonomy, and interactive adaptation provide, for the first time in the history of Western civilization, a rigorous theoretical basis for the achievement of dynamic equilibrium between human individuals, groups, and societies. Looking at the world today, it would be difficult not to conclude that a way of thinking which, rather than foster competition and conflict, deliberately aims at adaptation and collaboration may be the only way to maintain human life on this planet.

## **Acknowledgment**

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