



ASC

American Society for Cybernetics
a society for the art and
science of human understanding

Doing the Cybernetics of Cybernetics

Cybernetics: Art, Design, Mathematics—A MetaDisciplinary Conference

Ranulph Glanville¹

Ernst von Glasersfeld, in an after dinner speech, reminded us of *constraint*. He remarked “my life has turned out to be an illustration of a cybernetic principle. I started out without any idea of what I wanted to do, but there were things I was very sure I didn’t want to do. I was not guided by a fixed purpose, but by a set of constraints.”² It was a remarkably apposite remark to make at the recent ASC conference, “Cybernetics: Art, Design, Mathematics—A MetaDisciplinary Conversation” (C:ADM). It is also a remark that fits the tradition of cybernetic comments on cybernetic events, what Margaret Mead wrote about as the “Cybernetics of Cybernetics” (Mead, 1968).³

In this column, I shall look at the ASC conference as an example of an event that is a cybernetic system, operating in a cybernetic manner: that is, as an example of the cybernetics of cybernetics in operation. But, first, I need to sketch the conference, for it was not a conventional conference.

The Conference

The whole conference process took the 8 days between 29 July and 5 August 2010, inclusive. However, this report is based primarily on the central component, the 3 days referred to as C:ADM.

Many have commented on shortcomings in conference design (often remarking “the real meeting happened in the coffee breaks”), and some have attempted to overcome them. The Society for General Systems Research (SGSR; now the

1. Ranulph Glanville is current president of the ASC. Contact information: CybernEthics Research, Southsea; email Ranulph@glanville.co.uk
2. You can find a video, and a slightly revised text, at <http://www.asc-cybernetics.org/2010/?p=2700>. The text is also published in this journal, as part of this ASC column (Glasersfeld, this issue).
3. The ASC is promoting an open competition on the theme of the Cybernetics of Cybernetics: visit <http://www.asc-cybernetics.org/CofC/>.

International Society for the Systems Sciences [ISSS]) silver jubilee conference held in London (1979) contained an anti-conference organised by Stafford Beer and Gordon Pask, for which Pask (1979) wrote a strong criticism of conferences. At around the same time, Annetta Pedretti organised two workshop conferences on Self-Reference: the first in the Isle of Wight (directly after the SGSR conference) and the second in Acapulco. In 1981 Bela Banathy introduced his “Fuschl Conversations”) supported by the International Federation for Systems Research (IFSR), which have since occurred after the bi-annual European Meeting on Cybernetics and Systems Research (EMCSR) conferences in Vienna. But perhaps the most important precedent for cybernetics is the Josiah Macy, Jr. conferences held in New York in 1942 and then 1946 to 1953, chaired by Warren McCulloch. With the theme “Circular Causal and Feedback Mechanisms in Biological and Social Systems,” these are the main modern forerunners to Wiener’s announcement of cybernetics, and although they had paper presentations, they are renowned for the fierceness of their debate. Such collegial debate was continued in, for instance, the Wenner Gren meeting on “The Effects of Conscious Purpose on Human Adaptation” chaired by Gregory Bateson in 1968. Mary Catherine Bateson’s *Our Own Metaphor* (2005) acts as a proceedings for that conference and inspires the sort of outcome we hope to have from the C:ADM workshop.

The purpose of our C:ADM conference was to encourage discussion: to create the next question rather than to listen to reports on already decided answers to old questions. To give focus to the discussion, three themes were proposed. Based on comments from the conferees prior to the conference these were compressed to two:

1. actual and abstract
2. cross-over processes/ trans-, inter-, meta-⁴

The purpose of the themes was to provide a common background and focus to our varied discussions. Conversations exist in a context and are about something (which I call conversational substrates), even though what they are about changes. The themes helped us focus our conversations, to provide coherence. These themes were chosen to be abstract enough to be generally relevant, and to reflect what we felt were particular qualities shared by all four subjects (cybernetics, art, design, and mathematics) in our conference title.

The conference opened, the Provost of RPI and the Dean of its architecture school welcomed us with beautifully considered talks—and we set to. After a reminder of the conference themes and a briefing on how it was to work, we sang. I taught people the basics of *harmonic singing*. We improvised a performance based in listening to others, a variant⁵ of my piece “50±2” for academic choir. We sang from the choir seats in

4. You can find elaborations of these themes on the web site at http://www.asc-cybernetics.org/2010/?page_id=895.

You will notice 2 themes scored through, which we rolled together to give a new theme, appearing third in the list but originally absent. The theme appearing fourth is unchanged and was, originally the third theme.

5. Suggested by Aartje Hulstein

EMPAC's concert hall, and then listened to a recording of our performance from the stalls.⁶ The reason for singing was to get us all to listen to each other, the prerequisite for a conversation: As the artist Joseph Beuys remarked, there is no conversation without listening. I wanted us to listen to those around us, and learn. Using the musical metaphor, we listened to our neighbours' singing and adapted our singing towards theirs. The result was a much stronger coming together than might have been expected! In one report on the conference, this experience was seen not only to have prepared us, but also as providing a metaphor for the whole conference that increased in power as a metaphor as the event progressed.

We divided the remaining two and a half days into two sessions, one for each theme, organised in similar ways (but open to modification). After an introductory reflection we divided into groups which eventually reported back in facilitated sessions. We ended with a closing reflection on our *next questions*, and a conference feedback session. The progress of the conference was reported on the web site in near real time: so, for instance, the next questions can be found on the blog.⁷

Evenings were left free for *instant responses*, and for those who needed to present papers.⁸ We invited conferees to bring a *standard* with them intended to capture who they were and engender discussion. These art and design projects, which were displayed, along with a loop of video works,⁹ in the foyer of the EMPAC building.¹⁰

The conference took the form described as a result of considerable thought and discussion between committee members and others over the course of 4 years. In effect, it was a large group design. But it was not a closed system: The conference was open throughout to modification and improvisation.

Who Came?

Eighty people, from a variety of backgrounds and from across the world, took part in C:ADM.¹¹ They covered the age range from high school to nonagenarian; their professions and specialisms ranged (for instance) over management, physiotherapy, education, engineering, topology, architecture, student-in-perpetuity, consultant, games designer, and even a cybernetician or two. They came because they wanted to join in a conversation, to explore how to relate the four subjects of the conference, and out of curiosity: The process of acceptance through posting (and, where requested, reworking) statements of interest made sure they understood the conversational proposition, and that we started with the cybernetics of cybernetics.

6. You can hear this recording at <http://www.asc-cybernetics.org/2010/?p=2524>

7. Thanks to the energy and commitment of Thomas Fischer and Candy Herr

8. See <http://www.asc-cybernetics.org/2010/?p=2600>

9. Curated by Jennifer Canary

10. Many of the standards can be seen at <http://www.asc-cybernetics.org/2010/?p=2696>

11. This number included all the trustees of the ASC. For the first time in the ASC's history, the trustees played an important and active part. It was wonderful to have their presence and advice. We believe this to be unusual.

Cybernetics of Cybernetics

Mead's paper, the "Cybernetics of Cybernetics" (Heinz von Foerster created the title) makes two major points. It is celebrated for suggesting that a cybernetic society (for instance, the ASC) and its means of expression, such as its conferences, should operate according to its own (cybernetic) principles—cybernetics applied to cybernetic societies and cybernetic events. Mead also reminds us that cybernetics is a (rather abstracted) language, allowing people from different disciplines to discover and discuss similarities otherwise hidden in the particular language of the different disciplines (their jargons): it is meta-disciplinary, and it enables the trans-disciplinary. All four subjects in the conference title (cybernetics: art, design, mathematics) are such *meta-* subjects, used to describe, inform, evaluate, even spin other subjects, and, in the end, themselves. This brings Mead's two points together, giving us self-reference, recursion and reflexivity, which so characterise second order cybernetics. The conference was meta- and trans-disciplinary both in the choice of subject areas and in the way it moved to transcend even these meta- and trans-disciplinary subjects. It was thus cybernetic, in the manner in which Mead talked of an abstracted language. The way we handled meta-and trans-disciplinarity was also cybernetic: It practised Mead's (and Foerster's) cybernetics of cybernetics.

How Did C:ADM Exemplify the Cybernetics of Cybernetics?

The theme of the conference is cybernetic in several ways. Cybernetics was itself a topic, as was the notion of cybernetics as a abstracting language facilitating communication across different subjects. Furthermore, the consequent but central themes such as self-reference, recursion and reflexivity—as noted above, are all cybernetic topics. It was a conference of the American Society for Cybernetics, so it may be taken that an interpretation of Mead's cybernetics of cybernetics was satisfied in a fairly straightforward way, and needs no further discussion.

However, a more sophisticated response to Mead's question concerns the manner of operation of the conference: in what ways did the running of the conference display cybernetic behaviours and principles?

A Non-traditional Conference

Traditionally, conferences are built around the reporting back to a community of interest of findings and developments. The standard unit of such a conference is the paper presentation (in the older idiom, reading the paper). Authors present their (refereed) paper to an interested audience, often in one of several parallel sessions. After presentation, there is a short period for questions. Papers have been accepted in advance through a peer review process. The program for the conference is determined and timed in advance, and the content of each time slot is determined. There is little flexibility, almost no improvisation, and the whole event is very limited by tight

constraints and restrictive control. Some participants attend for little more than the session they present their paper in. Few can attend without presenting a paper.

C:ADM was a conference in which almost none of this applied. We were determined we should be able to change and adapt as the conference progressed. The shape and detail of the conference was a result of continuing monitoring and improvisation, of listening to suggestions with an open mind, and of the participants' willingness to commit to the conference and adapt to structural changes and the addition of detail as the conference continued. Almost all conferees attended throughout, including the evening sessions, for which, to be maximally responsive, I prepared a schedule in the afternoon and even modified that schedule in the evenings as they progressed (adaptive planning.)

Conversation

The main intention of the conference was to encourage conversation: in effect, to make the coffee break the conference (so we did not have coffee breaks)! We wanted to encourage discussion, to reveal the new. Recently I argued that conversation, of necessity, generates novelty: Reflection on decent conversation reminds us that conversation has an ability to take us to places we had not anticipated: It is one way in which we create novelty (Glanville, 2009).

Conversation may be thought of as epitomising interaction, and is a basic mechanism of second order cybernetics—also called, in early days, the cybernetics of cybernetics. There is no conversation without conversationalists, and there is no conversation without listening.¹² To use conversation as the mode of communication in a conference is already to create a conference that accommodates Mead's requirement.

Pask's structural requirement of a conversation is the use of two layers: the layer on which the conversation happens, and a meta-conversation, allowing the conversation to be *steered*. On the meta- (the corrective) layer, we criticise, ask questions (conversationally) such as "Is this what you were saying?" or "Can we get back to the point?" As indicated earlier, I insist on a third, substrate layer—the theme on which the conversation is based. This layer indicates the constraints within which the conversation happens by providing the theme, and a direction and range for that theme (what the conversation is about, or its context). All 3 layers co-exist, and they can be raised or lowered: the theme on the substrate becomes the topic of

12. Conversation is perhaps the main way humans communicate one with another. I have written in this Journal about Pask's notion of conversation on many occasions. Pask's interest is in a mechanism that allows communication without requiring that meanings are transferred (essential the moment that we take on board the second order cybernetic insistence that the observer is always present in the observing system (every conversationalist is present in every conversation), and that meanings are internal to each observer/conversationalist). Consequently communication between conversationalists involves a functional parallelism: we do not communicate meanings, we build individual meanings that are internal and personal, but which seem to lead to similar behaviours. It is this almost mechanical structure (mechanism) which supports the freedom of individual meanings, giving a way that we can communicate while respecting individual difference.

conversation, and so forth. Thus, the central importance of the 2 conference themes, providing the conversational substrate, along with the more familiar ability not only to converse, but to talk about the conversation. We structured C:ADM to support conversation.

At the same time, there are limits to group sizes, if they are to work together well. The number usually given is 7 ± 2 (from George A. Miller's 1956 paper of that name). Seven participants was the number chosen by Stafford Beer for his Chilean Ops Room. We kept our groups to approximately this size, as the largest number that could sustain effective conversational interaction: a decision supporting our cybernetic understanding. Groups were determined, in the first case by a draw from a hat, and in the second by active grouping of short statements by participants. They appointed their own chairs and rapporteurs.

The organizers worked hard to brief participants. One way was by initiating conversations before the conference through the web site, where participants could learn about each other before meeting in Troy. This helped to affirm some of the other conditions necessary for conversations to work: namely open-mindedness, generosity towards and respect for the other, listening skills, and so forth.

Conversation allows new ideas to emerge, the expression of individual opinion, modification and improvement through reflection and working together, and improvisation.

Steering

There would be little point in holding a conversational conference, with all the dynamic that offers, if the other elements of the conference were inappropriately rigid. The interactive improvisation that typifies conversation needs to be reflected in the realisation of the conference itself. I have indicated some ways the conference was steered towards the form it finally took, as it happened, through improvisation.

Each conversational session ended in a facilitated meeting where one (or more) rapporteur(s) from each group presented the discussions of their group. These sessions allowed the groups to enjoy the discussions of other groups, while appreciating their differences. They also allowed problems to be brought to the fore, so the collective that was the conference, as well as each group acting autonomously, could self-regulate—with the involvement of the organisers. As a result, the mechanism for forming groups (see above), and the internal dynamics of the groups were different for each of the two themes/sessions. Had there been more sessions, no doubt we would have tried further modifications. As it was, we finished after two sessions with a wrap up that involved the individual summarising of the conference in the form of their own next question.¹³ We can see these as reflective corrections: and with a feedback session in which further improvements were suggested, some of which were tested in the workshop after the conference.

13. which can be found on the web site <http://www.asc-cybernetics.org/2010/?p=2773>.

Thus, the processes of the conference allowed considerable openness, just-in-time decision making, and responsive modification: a cybernetic way of treating a conference, contrasting greatly with the processes of the traditional conference. The themes (the conversational substrate) melded with the openness of constraint, conversational practice, optimal group sizing and processes to communicate between groups: Areas of potential improvement were at the cybernetic heart of the design and working of the conference.

A last word about the creative use of error, that behaviour without which there would be no cybernetics: we used error to improve our design. We did not so much try to correct it (to rule it out) as to use it as inspiration to extend our thinking.

Learning

Cybernetics has a long association with learning. C:ADM was a conference consisting, in essence, of a constantly reworked framework within which great freedom was left for individual expression, and for participants to explore their thinking in each other's company. It was organised so that not only could participants learn with each other and from each other's example, but the conference as a whole could be reshaped in the conference's own real time: the conference learnt: it was a learning conference.

Aspects of this learning were carried over into the post C:ADM workshop. The workshop exemplified what had been learnt, and gave space for that exemplification to grow, to develop, to live.

Participation

It was thrilling to see the intense concentration, the enjoyment and engagement, the quality of the listening and letting others speak, the willingness to engage together and not to try to dominate, that participants showed. They flooded out of the building onto the sunny and rather hot patio, they filled all corners of the foyer, as well as occupying the spaces allocated. They drew diagrams and wrote lists, and presented in the facilitated sessions in imaginative ways, often expressing a lot of fun.

I have not heard any complaints about the quality of the event or of the conversations—even when they had sticky periods. All the reports I have received have talked in the most positive terms, and have expressed satisfaction and enjoyment. Of course, being cynical one could ask what other response I might have expected to receive. But I think such cynicism is misplaced.

Of course, as with this whole column, this is my response and my reflection: my delight and enjoyment in how participants behaved. It was a grand event.

A Personal Reflection

The conference was intended to allow individual voices to be heard, and for the collective of those voices to provide ways forward—new questions. At the end of the final session, where I asked participants for their questions, I was asked in turn what my question was. I replied, expressing my frustration, “How can I put on a conference like this, so that I can join in it?”

What I learnt from the conference reflects a different type of experience from other participants. As conference chair I took it as my responsibility to make sure the conference worked—to the best of my ability. I had spent the conference listening, looking for suggestions, sensing, monitoring and tuning, but not joining in the conversations. While I had expected to do some of this managing I was surprised by how much had to be done and how this excluded me from the conversations not only because of the time this took, but also because of the mind-set it required. My presence as a conferee was constrained to the briefings and summaries (but excluding the conversational groups) which I greatly regret.

And yet ... Ross Ashby refers to cybernetics as an abstract subject involved in mechanism: the study of all possible machines. What I learnt in the conference was not a new insight but a reminder: that my cybernetics has always been concerned to support the freedom of others. I am interested in the framework that supports others improvising, conversing, learning and interacting. Much of the music I wrote in the 1960s was also concerned with this: a music of frameworks within which others could find the freedom to improvise, could play the music they wanted. A system of constraints giving the greatest freedom I could. I have described my interest, elsewhere, in terms of games. Some watch. Others play. They are refereed. There is a pitch, and there are rules. But before any of that, there is a field. I don't usually play. I am not even interested in the rules. My interest is to create the field that allows all the others to participate in the different manner that suits them, as player, spectator, referee...

At C:ADM I learnt you can rarely create and develop the framework and act within it at the same time. If you're making and maintaining the field, you won't play the game. That is the personal freedom I give up in order to facilitate the freedom of others. My wife confirms this with her comment on this manuscript: “It's a good description from outside,” she tells me. This is the conference that, in many ways, I was not really at. Perhaps you can adapt what Captain Beefheart once said: “I'm not really here. I just stick around for my friends.”

Conference committee and others

The conference committee was composed of people representing the participant bodies:

- for the ASC: Lou Kauffman, Albert Mueller, Candy Herr, Thomas Fischer, with me as chair.
- for the School of Architecture, Rensselaer Polytechnic Institute: Ted Krueger and Leon Morales
- for Experimental Media and Performing Arts Center: Ian Hamelin (project manager) co-ordinating the staff, under Johannes Goebel (EMPAC director).

Opening addresses were given by Robert Palazzo (Provost) and Evan Douglass (Dean of Architecture) from Rensselaer Polytechnic Institute.

The sessions were introduced by Paul Pangaro and Albert Mueller, and were facilitated by Tim Jachna and Candy Herr.

The web site was built and maintained by Thomas Fischer, and may be visited at http://www.asc-cybernetics.org/2010/?page_id=375. Some areas are for conferees only.

The conference booklet (compiled and designed by Candy Herr) can be downloaded from <http://www.asc-cybernetics.org/2010/?p=2476>

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