Introduction: a conference doing the cybernetics of cybernetics

Post-print version

Ranulph Glanville (University College London, London, UK)


Abstract

Purpose

This paper introduces the other papers in this issue, describing and arguing for the context in which they were written – a conference that was, unusually, based in conversation rather than reporting through the presentation of papers: and a refereeing process that continued after the initial presentation (at the conference) of the work reported, thus allowing responses to critical comments. Many of our authors do not come from scientific backgrounds, and writing papers such as we are used to is a novel experience to, and discipline for, them.

Design/ methodology/ approach

The organisation and structure of the conference and the processes of refereeing involved are described; and the argument is made that the particularities of each are more cybernetic than the more familiar arrangements.

Findings

The conference processes were greatly valued by the authors. This is evident in the papers presented in this volume, although the convention of presenting only the final form of the paper may mean it is only evident to those who have been involved in the process of writing and refereeing.

Research limitations/ implications

The limitations of the approach presented here are a combination of what we can imagine (supported by hard work) and the cultural willingness of funding sources to accept the unfamiliar.

Practical implications
The contents of this volume, that form an outcome of the conference, show it is possible and interesting to create a “non-standard” conference based in conversation, which searches for new questions rather than reporting answers to old ones: and that papers produced within a conversational process of refereeing and discussion allow both development of research-in-writing, and a good quality outcome. We can and should meet in “better” ways.

Social implications

The conference and papers associated with it show that meetings in which a conversational approach is taken can be viable, not only as academic occasions but in their ability to generate papers of quality. This opens the academic world to different types of meeting and different ways of associating.

Originality/value

The value of this paper lies in the arguments made concerning conferences and refereeing processes. The originality is in the way these are presented as the embodiment of cybernetic understandings and processes (thus realising a cybernetics of cybernetics). The quality of the introduction is enriched by frequent references to material of generation and of record that exists as the legacy of the conference “Cybernetics: Art, Design, Mathematics – A Meta-Disciplinary Conversation” at frequently cited urls on the conference web site. The evidence is there, as well as in this volume.
Background

In the summer of 2010, the American Society for Cybernetics (ASC) held an unusual, experimental conference on the theme “Cybernetics: Art, Design, Mathematics – A Meta-Disciplinary Conversation” (C:ADM), at the Curtis R. Priem Experimental Media and Performing Arts Centre (EMPAC) at Rensselaer Polytechnic Institute (RPI), Troy, New York. The experiment was to hold a good-sized conference in which we attempted to find new questions with which to challenge the future rather than to report on answers to questions we already know, using the currency of conversation rather than paper presentations.

Of course, the organisers were aware of the current climate in which conference attendance is tied to the presentation and publication of a refereed paper. We decided, therefore, to consider papers that were related to the two themes (see below) we developed to bring cohesion to our conversations.

Thus, in introducing this special double issue of *Kybernetes*, I need to cover two areas:

1. The first is the nature of the conference itself, how it was designed and how it ran. Integral to this is how we used the resources of the internet to further conversational activity and build a record of our activities. The web site, which started as an introduction to a proposal, became a medium of discussion and of refereeing, and ended as a place of record, and a blog. (I shall also argue that this conference not only discussed cybernetics and presented cybernetic ideas: it also practised cybernetics. The conference did what it talked about: it walked the work. This is one interpretation of Margaret Mead's call for us to do cybernetics cybernetically[1].)

2. The second is the process by which the papers in these issues came to be in the form they are in. This involved a rich layering of refereeing processes, and the willingness of participants to take what they learnt at the conference and build that into their papers. The papers as published here are thus different to most conference papers, in that, in their final form, they grow out not only of the research they present, but out of the act of presenting it within the culture of our conference.

1. Conferences and the ASC 2010 Conference

Many have commented on shortcomings in conference design (epitomised in the remark “the real meeting happened in the coffee breaks”), and some have attempted to overcome them. The Society for General Systems Research (SGSR; now the International Society for the Systems Sciences) 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 Silver Jubilee Conference) and the second in Acapulco. In 1981, Bela Banathy introduced his “Fuschl Conversations” supported by the International Federation for Systems Research, which have since occurred after the bi-annual
European meeting on cybernetics and systems research conferences in Vienna, while the ASC has held a number of “study” conferences that are essentially conversational in form. Graham Barnes and the think tank “Future 2020” organised an important and optimistic conversational working conference held in Brioni, Croatia, in 2004, which applied cybernetic thinking to the future of the Balkans and included significant politicians from the countries concerned. These are a few examples from our field. Many will have their own examples, also from other fields. But perhaps the most important precedent, for cybernetics, is the Josiah Macy, Jr conferences held in New York in 1942 and then 1946-1953, chaired by Warren McCulloch. With the theme “Circular causal and feedback mechanisms in biological and social systems”, these are the main modern forerunners of 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. Bateson's (2005) *Our Own Metaphor* acts as a proceedings for that conference and inspires the sort of outcome we hoped 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 hear 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; and
2. cross over processes/trans-, inter-, meta-[2].

The purpose of these 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 is at any moment liable to change. 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 ASC has a tradition of conferences, and of a rich and important social life at these conferences, that we hoped to retain. To that end, we had both a pre- and a post-conference. At the (two-day long) pre-conference, we held the society's business meeting, had a workshop on the current state of cybernetics (organised and facilitated by Stuart Umpleby) and gave tutorials on cybernetics to those who wanted to join in. The post-conference consisted of a workshop that capitalised on what we had learnt at the main conference – which is what is described in this introduction – including the production of a film of the conference edited by Lev Ledit and Judy Lombardy, and a book due to be published early in 2012[3]. These pre- and post-conference events were available without charge to all attending the main conference. We are repeating this arrangement of three conference parts, and the conversational means of conferring[4] this year, as we attempt to confirm this as a viable alternative to the traditional conference.

The conference film is structured around what turned out to be the last public appearance of ASC Wiener Gold Medal Winner and Honorary Fellow, Ernst von Glasersfeld, who died 12 November
2010. Glasersfeld was an exceptional experimental cybernetician who moved to build an epistemological position growing out of Piaget's concept of “object constancy”. He gave a short and salient after dinner talk in which he talked of himself and his life in cybernetics. That it was his last public appearance adds piquancy to his testimonial statement[5].

The conference proper 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 variant[6] of my piece “50±2” for academic choir. We sang from the choir in EMPAC's concert hall, then moved to the stalls to listen to a recording of our performance. 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[7]. I wanted us to listen to those around us, and learn from them. 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[8].

Evenings were left free for instant responses and improvisations, and for those who needed to present papers[9]. We invited conferees to bring a standard (flag) with them intended to capture who they were and engender discussion. These art and design projects were taken from session to session and were displayed at other times, along with a loop of video works[10], in the foyer of the EMPAC building[11].

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

Who came?

A total of 80 people, from a variety of backgrounds and from across the world, took part in C:ADM[12]. They covered the age range from high school student 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 couple who actually called themselves “cyberneticians”. 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
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 inter-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 inter-disciplinary both in the choice of subject areas and in the way it moved to transcend even these meta- and inter-disciplinary subjects. It was thus cybernetic, in the manner in which Mead talked of an abstracted language. The way we handled meta- and inter-disciplinarity was also cybernetic: we 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, itself, was a topic, as was the notion of cybernetics as an abstracting language facilitating communication across other, 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 ASC, 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 of findings and developments to a community of interest. 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. Nowadays, few will receive finance to 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 the conference, 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 scheduled no 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, just as there is no conversation without listening[13][14]. 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, mechanical requirement of a conversation assumes 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 (i.e. its context). This layer indicates the constraints within which the conversation occurs by providing the theme, and a direction and range for that theme (what the conversation is about, or its context). All three layers co-exist, and they can be raised or lowered: the theme on the substrate becoming the topic of conversation is perhaps a key to how humans communicate one with another. I have written 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 means by which we can communicate while respecting individual difference, and so forth. Thus, the central importance of the two 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 \(7\pm2\) (from 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 organisers worked hard to brief participants. One way was by initiating our conversations before the conference through the web site, where participants could learn about each other and start communicating before meeting in Troy. This helped 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 it 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 already indicated some ways the conference was steered towards the form it finally took, as it unfolded, 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 these 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 each individual summarising their conference in the form of their own next question[15]. 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.

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 error 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.

It was this approach which turned the process of conferring into a process of research. The meeting itself carried out a form of research – of disciplined, rigorous, deep searching: it also sought to create that fabled beast of formalised contemporary research practice – the (next) research question.

**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, sketched cartoons and wrote lists, and presented in the facilitated sessions in imaginative ways, often expressing a sense of fun as well as a lot of thought.

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. Being cynical, one could ask what other response I (as conference chair) might have expected to receive. But I believe such cynicism is misplaced.

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

**2. The papers**

I noted that the C:ADM conference was not primarily concerned with paper presentations. Yet, we had paper presentations, as can be seen by the existence of this issue of *Kybernetes!* This needs explanation.

The reason we accommodated papers and paper presentations was the pragmatic one I have already indicated: for the majority of university people, the funding of conference attendance is conditional on presenting and publishing a paper.

Our main concern was to find processes through which papers (and their presentation) could be
handled in a conversational manner in sympathy with the aims and tone of the rest of the conference, so the benefit of the conversations could enrich the papers.

There are two aspects I shall discuss: processes of presentation; and processes of refereeing.

**Paper presentation**

We accepted papers that were related to the two conversation themes we had proposed: actual and abstract, and cross-over processes/trans-, inter-, meta-. Having these themes meant that the authors could be seen as preparing for the conversation by writing their papers. We took it that involvement in the appropriately themed conversation meant that the material of the paper would be presented (and, of course, discussed) in the conversation on that theme. This is an effective form of refereeing, as had been well demonstrated in the “Problems of […]” conferences directed by Gerard de Zeeuw and myself from 1979 to 2001 inclusive, where the notion of (presentation at) the conference as refereeing process had been extensively used.

But we also admitted more conventional, formal presentations in the evenings. The evenings were left unscheduled up to the last minute, to be filled with offerings and to be responsive to opportunities – and needs – that arose during the conference: the urge to present a paper was taken to be such an offering (along with short lectures, slide shows, improvised performances and “jamming”, and demonstrations). In total, we had 28 presentations in the evenings (half of which were not paper related).

**Paper refereeing**

The refereeing process was very thorough indeed, using a variety of different approaches.

Proposals for papers were refereed, initially in the form of extended abstracts, by the organising committee. The authors of those accepted were asked to write drafts, which were posted on the conference web site for open refereeing by other conferees a month before the conference. (This was also part of the familiarisation conversation we encouraged all participants to enter into.) Authors were expected to reconsider their drafts in the light of these refereeing comments.

After the conference, all who wished to have a paper published were required to submit a reworked draft that took into account what they had learned at the conference both from comments directly aimed at them and from the whole experience. These new drafts were blind refereed by two referees, whose comments were moderated and resolved by the editors. Referees' comments were acted on, and the reworked drafts were returned to the referees for their comments and to confirm their satisfaction with the changes. Any remaining disagreements and discrepancies were resolved by the editors.

The refereeing process was, thus, also conversational – in the sense that it brought together the judgements of many in a series of processes that lead to improvement and, on occasion, radical change. This is a progressive use of cybernetics in, for instance, the form of feedback, to sustain performance, applied to cybernetic papers. It is more supportive and “conversational” than the traditional form of refereeing, which is merely judgemental.
The results of these processes form the contents of this issue, having been through an extended and constructive refereeing process of extraordinary thoroughness.

3. A personal reflection

I would not be acting cybernetically if I did not give my own 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 – through productive and egalitarian developments occurring in conversation. At the end of the final session, when 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 was the importance of preparation and prior consideration in providing a basis for improvisation. Of course, no preparation could ever cover what occurred: but it did create a frame of mind and a rich background against which improvisation could take place with a good chance of success. It was also important to catch the spirit of the moment: what worked at a particular time would not work at another time even if the conditions were apparently the same.

But my experience was different 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 spent the conference listening, looking for suggestions, sensing, worrying, monitoring and tuning, but not really 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 taken, but also because of the mind-set it required. My presence as a conferee was constrained to the briefings and summaries but excluded the conversational groups, which I greatly regret. I was, after all, a most vocal proponent of this sort of meeting.

And yet Ross Ashby refers to cybernetics as an abstract subject focused on mechanism: the study of all possible abstract 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 frameworks that support 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 manage. I have described my interest, elsewhere, in terms of games. Some watch. Others play. There are coaches. The games are refereed. There is a pitch, and there are rules. But before any of that, there is a field. I do not usually play. I am not even interested in the rules. My interest is to create the field that allows all the other activities in as free and varied a way as is possible so each may participate in the different manner that suits them, as player, spectator, referee.

At C:ADM I learnt I can rarely create and develop the framework and act within it at the same time. If you are making and maintaining the field, you would not 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 paper: “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 might like to adapt what Captain Beefheart once said: “I'm not really here. I just stick around for my friends”.

4. 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 (Ranulph Glanville) as Chair;

- for the School of Architecture, Rensselaer Polytechnic Institute: Ted Krueger and Leon Morales; and

- for Experimental Media and Performing Arts Center (at RPI): Ian Hamelin (Project Manager) coordinating the staff, under Johannes Goebel (EMPAC Director).

Opening addresses were given by Robert Palazzo (Provost) and Evan Douglis (Dean of Architecture) from RPI.

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

The web site was built and maintained by Thomas Fischer, and may be visited at: [www.asc-cybernetics.org/2010/?page_id=375](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: [www.asc-cybernetics.org/2010/?p=2476](http://www.asc-cybernetics.org/2010/?p=2476)

Notes


1. Mead presented the notion that cybernetics should be done cybernetically in her paper “Cybernetics of cybernetics” (Mead, 1968). The ASC recently promoted an open competition on the theme of the cybernetics of cybernetics: visit the web site at: [www.asc-cybernetics.org/CofC/](http://www.asc-cybernetics.org/CofC/)

2. You can find elaborations of these themes on the web site at: [www.asc-cybernetics.org/2010/?page_id=895](http://www.asc-cybernetics.org/2010/?page_id=895). You will notice two 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.


4. “Have discussions; exchange opinions”, in the *Oxford Dictionary of the American Language*.

5. A video record of his talk may be found at: [www.asc-cybernetics.org/2010/?p=2700](http://www.asc-cybernetics.org/2010/?p=2700)

7. You can hear this recording at: www.asc-cybernetics.org/2010/?p=2524

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


11. Many of the standards, together with their creators, can be seen at: www.asc-cybernetics.org/2010/?p=2696

12. This number included all the trustees of the ASC. For what we believe was 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.

13. Conversation, in this sense of a structure of exchange, is perhaps the main way humans communicate one with another.

14. Listening is the topic of the ASC's 2011 conference, being held in Richmond, Indiana, 9-15 August inclusive (www.asc-cybernetics.org/2011/).

15. This can be found on the web site at: www.asc-cybernetics.org/2010/?p=2773

References

Bateson, M. C. (2005), Our Own Metaphor, Hampton Press, Cresskill, NJ.


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